



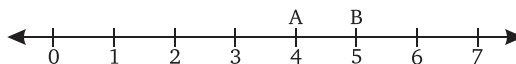
# Knowing Our Numbers

# 1



## Exercise-1.1

1. Using the given figure answer the following :



- (a) The predecessor of 1 is **0**.  
 (b) The successor of 6 is **5**.  
 (c) The letters *A* and *B* represent the numbers **4** and **5**.

2. Write the predecessor of the following numbers :

- (a) Predecessor of 64 =  $64 - 1 = 63$                       (b) Predecessor of 100 =  $100 - 1 = 99$   
 (c) Predecessor of 999 =  $999 - 1 = 998$                       (d) Predecessor of 78090 =  $78090 - 1 = 78089$

3. Write the successor of the following numbers :

- (a) Successor of 79 =  $79 + 1 = 80$                       (b) Successor of 50000 =  $50000 + 1 = 50001$   
 (c) Successor of 7830001 =  $7830001 + 1 = 7830002$   
 (d) Successor of 10101018 =  $10101018 + 1 = 10101019$

4. Which one is the greatest?

- (a) 2345 is the greatest                      (b) 2675 is the greatest                      (c) 7709 is the greatest  
 (d) 2345 is the greatest                      (e) 7907 is the greatest                      (f) 2645 is the greatest

5. Write the greatest and the smallest of the following :

- (a) Greatest – 30156    Smallest – 3420                      (b) Greatest – 49560    Smallest – 40956  
 (c) Greatest – 79775    Smallest – 77095                      (d) Greatest – 19088    Smallest – 10889

6. Arrange the following numbers in descending order :

- (a)  $16752 > 16746 > 14676 > 12431$                       (b)  $24063 > 23067 > 23066 > 23064 > 20366$   
 (c)  $19803 > 19708 > 18095 > 10995 > 10895$

7. Using the digits 2, 3, 9, 6 write :

- (a) Arranging 2, 3, 9, 6 in descending order  
 We get                      9, 6, 3, 2 ( $9 > 6 > 3 > 2$ )  
 Thus, the greatest number is 9632  
 (b) Arranging 2, 3, 9, 6 in ascending order  
 We get                      2, 3, 6, 9 ( $2 < 3 < 6 < 9$ )  
 Thus, the smallest number is 2369.  
 (c) Now, we have only four digit and we make greatest 5-digit number. Thus one digit should be repeated.  
 To get the greatest number, largest digit is repeated.  
 Thus required 5-digit number is 99632.  
 (d) Now we have only four digit and we make smallest 6-digit number. Thus two digit should be repeated.  
 To get the smallest number, smallest digit is repeated.  
 Thus, required 6-digit number is 222369.

8. Change the position, if required, to get the smallest six digit number :

- (a) To get the smallest six digit number, we arrange them in ascending order.

Now, the order is 0, 2, 3, 6, 7, 9

We shift 0 in the second place.

Thus, the required number is 203679

- (b) To get the smallest six digit number, we arrange them in ascending order.

Now, the order is 1, 2, 3, 5, 8, 9

Thus the required number is 123589.

- (c) To get the smallest six digit number, we arrange them in ascending order.

Now, the order is 0, 1, 2, 3, 5, 6

We shift 0 in the second place.

Thus, the required number is 102356.

- (d) To get the smallest six digit number, we arrange them in ascending order.

Now, the order is 0, 2, 4, 5, 5, 6

We shift 0 in the second place.

Thus, the required number is 204556

9. Change the position, if required, to get the greatest, six digit number :

- (a) To get the greatest six digit number.

We arrange them in descending order  $9 > 8 > 7 > 5 > 2 > 1$ .

Required greatest six digit number = 987521.

- (b) To get the greatest six digit number, we arrange them in descending order  $9 > 6 > 5 > 2 = 2 > 1$

Required greatest six digit number = 965221

- (c) To get the greatest six digit number; we arrange them in descending order  $8 > 4 > 3 > 2 > 1 > 0$

Required greatest six digit number = 843210

- (d) To get the greatest six digit number, we arrange them in descending order  $7 = 7 > 5 > 2 > 0 = 0$

Required greatest six digit number = 775200

10. Use the given digits to make the greatest and smallest four digit number :

- (a) **To form the greatest four digit number.**

We arrange them in descending order = 8, 7, 4, 2

Greatest four digit number = 8742

**To form the smallest four digit number.**

We arrange them in ascending order = 2, 4, 7, 8

Smallest four digit number = 2478

- (b) **To form the greatest four digit number**

We arrange them in descending order = 9, 8, 4, 2

Greatest four digit number = 9842

**To form the smallest four digit number**

We arrange them in ascending order = 2, 4, 8, 9

Smallest four digit number = 2489

- (c) **The form the greatest four digit number**

We arrange them in descending order = 7, 5, 4, 0

Greatest four digit number = 7540

**To form the smallest four digit number**

We arrange the ascending order = 0, 4, 5, 7

We shift 0 in the second place

Thus, the smallest number = 4057

- (d) **To form the greatest four digit number**

We arrange them in descending order = 9, 6, 4, 1.

Greatest four digit number = 9641

**To form the smallest four digit number.**



We arrange them in descending order 1, 4, 6, 9

Smallest four digit number = 1469

(c) **To form the greatest four digit number**

We arrange them in descending order 5, 4, 3, 0

Greatest four digit number = 5430

**To form the smallest four digit number**

we arrange them in ascending order 0, 3, 4, 5

0 put in second place

Smallest four digit number = 3045

**11. Make the greatest and smallest five digit number by using the following digits :**

In all conditions, we have three digit and we make five digit number thus two digit should be repeated.

(a) To get greatest number, we arrange 3, 9, 7 in descending order and largest number 9 digit is repeated two times. Thus, required number = 99973.

To get smallest number, we arrange 3, 9, 7 in ascending order and smallest number 3 digit is repeated in two times. Thus, required number 33379.

(b) To get greatest number, we arrange 9, 0, 5 in descending order and largest number 9 digit is repeated two times.

Thus, required number = 99905.

To get smallest number, we arrange 9, 0, 5 in ascending order (0 put in second place) and smallest number 0 digit is repeated two times.

Thus, required number = 50009.

(c) To get greatest number, we arrange 0, 5, 7 in descending order and largest number 7 digit is repeated two times.

Thus required number = 77750.

To get smallest number, we arrange 0, 5, 7 in ascending order (0 put in second place) and smallest number 0 digit is repeated two times.

Thus, required number = 50007

(d) To get greatest number, we arrange 9, 5, 2 in descending order and largest number 9 digit is repeated two times. Thus, required number = 99952

To get smallest number, we arrange 9, 5, 2 in ascending order and smallest number 2 digit is repeated in two times. Thus, required number = 22259

**12. Make the greatest and smallest four digit numbers using any four different digits with the conditions given.**

(a) 4 at tens place

	Th	H	T	O
The greatest number	= 9	8	4	7
The smallest number	= 1	0	4	2

(b) 9 at hundreds place

	Th	H	T	O
The greatest number	= 8	9	7	6
The smallest number	= 1	9	0	2

(c) 7 at ones place

	Th	H	T	O
The greatest number	= 9	8	6	7
The smallest number	= 1	0	2	7

(d) 1 at thousand place

	Th	H	T	O
The greatest number	= 1	9	8	7
The smallest number	= 1	0	2	3

**13. How many 7-digit numbers are there in all?**

**Ans.** The greatest 7-digit number = 99,99,999

The smallest 7-digit number = 10,00,000

Number of all 7-digit numbers =  $99,99,999 - 10,00,000 + 1$   
 $= 89,99,999 + 1 = 90,00,000$

Hence, there are ninety lakh numbers of 7-digits in all.

## Exercise- 1.2

- Fill in the blanks :
  - 1 Million = **1000** thousand
  - 1 crore = **10** million
  - 1 lakh = **100** thousand
  - 1 crore = **100** lakh
  - Ten crore = **100** million
  - 1 Hundred = **10** tens
- Expand the following numbers to complete the blanks :
  - $5673 = 5 \times 1000 + 6 \times 100 + 7 \times 10 + 3 \times 1$
  - $315631 = 3 \times 100000 + 1 \times 10000 + 5 \times 1000 + 6 \times 100 + 3 \times 10 + 1 \times 1$
  - $92756 = 9 \times 10000 + 2 \times 1000 + 7 \times 100 + 5 \times 10 + 6 \times 1$
- Find the place value and face value of the underline digit in each of the following numbers :
  - Place value of 1 in  $731562 = 1000$   
Face value of 1 in  $731562 = 1$
  - Place value of 9 in  $3573291 = 90$   
Face value of 9 in  $357291 = 9$
  - Place value of 7 in  $75319058 = 70000000$   
Face value of 7 in  $75319058 = 7$
  - Place value of 9 in  $9000581 = 9000000$   
Face value of 9 in  $9000581 = 9$
- Insert commas suitably and write number names according to the Indian system of numeration :
  - 8,50,319 – Eight lakh fifty thousand three hundred nineteen.
  - 8,05,132 – Eight lakh five thousand one hundred thirty-two.
  - 58,735 – Fifty-eight thousand seven hundred thirty-five.
  - 91,58,267 – Ninety-one lakh fifty-eight thousand two hundred sixty-seven.
- Insert commas suitably and write the number names according to the International system of numeration :
  - 9,051,521 – Nine million fifty-one thousand five-hundred twenty-one.
  - 8,989,627 – Eight million nine hundred eighty-nine thousand six hundred twenty-seven.
  - 9,567,003 – Nine million five hundred sixty-seven thousand three.
  - 70,031,583 – Seventy million thirty-one thousand five hundred eighty-three.
- Write the numerals for following number names placing commas :
  - Nine million three hundred forty two thousand = 9,342,000
  - Fourteen lakh five hundred twenty three = 14,00,523
  - Three hundred seven million seven hundred fifty two thousand two hundred eighty = 307,752,280
  - Forty three crore fifteen lakh eight thousand seven = 43,15,08,007
- Rewrite the following number names using International system of numeration :
  - 724,112,301 – Seven hundred twenty-four million one hundred twelve thousand three hundred one.
  - 2,003,005 – Two million three thousand five.
  - 52,731,508 – Fifty-two million seven hundred thirty-one thousand five hundred eight.

8. Write the following number names using the Indian system of numeration :

(a) 5,06,912 – Five lakh six thousand nine hundred twelve.

(b) 2,73,41,607 – Two crore seventy three lakh forty one thousand six hundred seven.

(c) 37,79,51,419 – Thirty seven crore seventy nine lakh fifty one thousand four hundred nineteen.

9. Find the difference between the place value of two 1's in 71340159.

Ans. Place value in 71340159 = 1000000 and 100

Difference = 1000000 – 100 = 999900

10. Find the difference between the place value and face value of 8 in 7895201.

Ans. Place value of 8 in 7895201 = 800000

Face value of 8 in 7895201 = 8

Difference = 800000 – 8 = 799992

11. Fill in the blanks :

(a) 1 crore = **10** millions

(b) 1 lakh = **100** thousands

(c) 1 crore = **1000** thousands

12. Determine the product of the place values of two 5s in 451759.

Ans. Place value of 5 in 451759 = 50000, 50

Product = 50000 × 50 = 2500000



## Exercise-1.3

1. Round off the following numbers to the nearest tens, hundreds and thousands and complete the table.

	Number	Round off to tens	Round off to hundreds	Round off to thousands
(a)	7618	7620	7600	8000
(b)	5019	<b>5020</b>	<b>5000</b>	<b>5000</b>
(c)	2347	<b>2350</b>	<b>2300</b>	<b>2000</b>
(d)	6666	<b>6670</b>	<b>6700</b>	<b>7000</b>
(e)	8463	<b>8460</b>	<b>8500</b>	<b>8000</b>
(f)	5249	<b>5250</b>	<b>5200</b>	<b>5000</b>
(g)	7324	<b>7320</b>	<b>7300</b>	<b>7000</b>
(h)	3969	<b>3970</b>	<b>4000</b>	<b>4000</b>
(i)	1459	<b>1460</b>	<b>1500</b>	<b>1000</b>
(j)	4738	<b>4740</b>	<b>4700</b>	<b>5000</b>

2. Estimate each sum to the nearest ten :

(a) 58 is estimated to the nearest ten = 60

43 is estimated to the nearest ten = 40

Hence, the required estimation = 60 + 40 = 100



- (b) 68 is estimated to the nearest ten = 70  
13 is estimated to the nearest ten = 10  
Hence the required estimation =  $7 + 10 = 80$
- (c) 96 is estimated to the nearest ten = 100  
59 is estimated to the nearest ten = 60  
Hence the required estimation =  $100 + 60 = 160$
- (d) 14 is estimated to the nearest ten = 10  
68 is estimated to the nearest ten = 70  
Hence the required estimation =  $10 + 70 = 80$
3. Estimate each sum to the nearest hundred :
- (a) 336 is estimated to the nearest hundred = 300  
798 is estimated to the nearest hundred = 800  
Hence, the required estimation =  $300 + 800 = 1100$
- (b) 5238 is estimated to the nearest hundred = 5200  
1470 is estimated to the nearest hundred = 1500  
Hence, the required estimation =  $5200 + 1500 = 6700$
- (c) 189 is estimated to the nearest hundred = 200  
325 is estimated to the nearest hundred = 300  
hence, required estimated =  $200 + 300 = 500$
- (d) 498 is estimated to the nearest hundred = 500  
111 is estimated to the nearest hundred = 100  
Hence, required estimation =  $500 + 100 = 600$
4. Estimate each sum to the nearest thousand :
- (a) 83837 is estimated to nearest thousand = 84000  
13469 is estimated to nearest thousand = 13000  
23567 is estimated to nearest thousand = 24000  
Hence, required estimation =  $84000 + 13000 + 24000 = 121000$
- (b) 57701 is estimated to nearest thousand = 58000  
11385 is estimated to nearest thousand = 11000  
23599 is estimated to nearest thousand = 24000  
Hence, required estimation =  $58000 + 11000 + 24000 = 93000$
5. Estimate each difference to the nearest ten :
- (a) 63 is estimated to the nearest ten = 60  
19 is estimated to the nearest ten = 20  
Difference =  $60 - 20 = 40$
- (b) 79 is estimated to the nearest ten = 80  
32 is estimated to the nearest ten = 30  
Difference =  $80 - 30 = 50$
- (c) 91 is estimated to the nearest ten = 90  
59 is estimated to the nearest ten = 60  
Difference =  $90 - 60 = 30$
- (d) 117 is estimated to the nearest ten = 120  
97 is estimated to the nearest ten = 100  
Difference =  $120 - 100 = 20$
6. Estimate each difference to the nearest hundred :
- (a) 778 is estimated to nearest hundred = 800  
317 is estimated to nearest hundred = 300  
Difference =  $800 - 300 = 500$
- (b) 867 is estimated to nearest hundred = 900



171 is estimated to nearest hundred = 200

Difference =  $900 - 200 = 700$

(c) 7359 is estimated to nearest hundred = 7400

2323 is estimated to nearest hundred = 2300

Difference =  $7400 - 2300 = 5100$

(d) 3619 is estimated to nearest hundred = 3600

1101 is estimated to nearest hundred = 1100

Difference =  $3600 - 1100 = 2500$

7. Estimate each difference to the nearest thousands :

(a) 53836 is estimated to the nearest thousand = 54000

23886 is estimated to the nearest thousand = 24000

Difference =  $54000 - 24000 = 30000$

(b) 88008 is estimated to the nearest thousand = 88000

66666 is estimated to the nearest thousand = 67000

Difference =  $88000 - 67000 = 21000$

8. Estimate each of the following products by rounding off each number to the nearest ten :

(a)  $16 \times 39$

16 estimated to the nearest ten = 20

39 estimated to the nearest ten = 40

Hence, the required estimation =  $20 \times 40 = 800$

(b)  $28 \times 63$

28 estimated to the nearest ten = 30

63 estimated to the nearest ten = 60

Hence, the required estimation =  $30 \times 60 = 1800$

(c)  $51 \times 49$

51 estimated to the nearest ten = 50

49 estimated to the nearest ten = 50

Hence, the required estimation =  $50 \times 50 = 2500$

(d)  $36 \times 63$

36 estimated to the nearest ten = 40

63 estimated to the nearest ten = 60

Hence, the required estimation =  $40 \times 60 = 2400$

9. Estimate each of the following products by rounding off each number to the nearest hundred :

(a)  $509 \times 189$

509 estimated to the nearest hundred = 500

189 estimated to the nearest hundred = 200

Hence, the estimated product =  $500 \times 200 = 100000$

(b)  $294 \times 123$

294 estimated to the nearest hundred = 300

123 estimated to the nearest hundred = 100

Hence, the estimated product =  $300 \times 100 = 30000$

(c)  $412 \times 178$

412 estimated to the nearest hundred = 400

178 estimated to the nearest hundred = 200

Hence, the estimated product =  $400 \times 200 = 80000$

(d)  $111 \times 777$

111 estimated to the nearest hundred = 100

777 estimated to the nearest hundred = 800

Hence, the estimated product =  $100 \times 800 = 80000$

10. Find the estimated quotient for each of the following :

- (a)  $627 \div 23$   
 $627 \div 23$  is estimated to  $= 600 \div 20 = 30$   
Hence, the required estimation  $= 30$
- (b)  $986 \div 49$   
 $900 \div 49$  is estimated to  $= 1000 \div 50 = 200$   
Hence the required estimation  $200$
- (c)  $725 \div 23$   
 $725 \div 23$  is estimated to  $= 700 \div 20 = 35$   
Hence, the required estimation  $= 35$
- (d)  $184 \div 23$   
 $184 \div 23$  is estimated to  $= 200 \div 20 = 10$   
Hence the required estimation  $= 10$



## Exercise-1.4

1. Write the Roman numerals for :

- (a)  $152 = 100 + 50 + 2 = C + L + II = CLII$   
(b)  $356 = 300 + 50 + 6 = CCC + L + VI = CCCLVI$   
(c)  $562 = 500 + 50 + 10 + 2 = D + L + X + II = DLXII$   
(d)  $690 = 500 + 100 + (100 - 10) = D + C + XC = DCXC$   
(e)  $774 = 500 + 200 + 50 + 20 + 4 = D + CC + L + XX + IV = DCCLXXIV$   
(f)  $888 = 500 + 300 + 50 + 30 + 5 + 3 = D + CCC + L + XXX + V + III = DCCCLXXXVIII$   
(g)  $1236 = 1000 + 200 + 30 + 5 + 1 = M + CC + XXX + V + I = MCCXXXVI$   
(h)  $1638 = 1000 + 500 + 100 + 30 + 8 = M + D + C + XXX + VIII = MDCXXXVIII$   
(i)  $759 = 1000 + 500 + 200 + 50 + (10 - 1) = M + D + CC + L + IX = MDCCLIX$   
(j)  $1846 = 1000 + 500 + 300 + 40 + 5 + 1 = M + D + CCC + XL + V + I = MDCCCXLVI$   
(k)  $1982 = 1000 + (1000 - 100) + 50 + 30 + 2 = M + CM + L + XXX + II = MCMLXXXII$   
(l)  $2090 = 1000 + 1000 + (100 - 10) = M + M + XC = MMXC$

2. Write the Hindu-Arabic numerals for :

- (a)  $XXIX = X + X + IX = 10 + 10 + (10 - 1) = 29$   
(b)  $CXLI = C + XL + I = 100 + (50 - 10) + 1 = 100 + 40 + 1 = 141$   
(c)  $MCLVIII = M + C + L + VIII = 1000 + 100 + 50 + 8 = 1158$   
(d)  $CLXXI = C + L + XX + I = 100 + 50 + 20 + 1 = 171$   
(e)  $CCCLXII = C + C + C + L + X + II = 100 + 100 + 100 + 50 + 10 + 2 = 362$   
(f)  $MDCLVI = M + D + C + L + VI = 1000 + 500 + 100 + 50 + 1 = 1656$   
(g)  $CLXXXIX = C + L + XXX + IX = 100 + 50 + 30 + (10 - 1) = 100 + 50 + 30 + 9 = 189$   
(h)  $MCDXII = M + CD + X + II = 1000 + (500 - 100) + 10 + 2 = 1000 + 400 + 10 + 2 = 1412$

**I. MCQs : Choose the correct option :**

1. (a) 2. (d) 3. (b) 4. (c) 5. (b) 6. (a) 7. (b) 8. (c) 9. (c) 10. (c)

**II. Fill in the blanks :**

- The predecessor of 400 is **399 (400 - 1)**.
- Yes every natural number a whole number.
- '0' is the smallest **whole** number.
- Every natural number is a **whole** number.
- There are **seven** symbols in Roman numerals.

### III. State True (T)/False (F) :

1. F 2. T 3. T 4. F 5. F

### Mental Maths

1. Short form

$$\begin{aligned}4 \times 10000 + 0 \times 1000 + 1 \times 100 + 5 \times 10 + 7 \\= 40000 + 0 + 100 + 50 + 7 \\= 40157\end{aligned}$$

2.  $7 \times 1000 + 0 \times 100 + 1 \times 10 + 0 = 7000 + 0 + 10 + 0 = 7010$

3. Face value of 8 in 283 is 8.

4. Place value of 3 in 208304 is 300.

5. The largest four-digit number = 9999

$$\text{Successor} = 9999 + 1 = 10000$$

6. The smallest six-digit number = 100000

$$\text{Predecessor} = 100000 - 1 = 99999$$

7. '403460' written in Indian system = 4,03,460

Four lakh three thousand four three hundred sixty.

8. '1450308793' Written in International system 1,450,308,793

One billion four hundred fifty million three hundred eight thousands seven hundred ninety three.

### Puzzle

$$\begin{array}{r}142857 \\ \times 3 \\ \hline 428571\end{array}$$

$$\begin{aligned}A &= 4 \\ B &= 2 \quad E = 7 \\ C &= 8 \quad D = 5\end{aligned}$$



# Whole Number

# 2



## Exercise-2.1

1. Write down the following :

(a) The smallest 6-digit number = 1000000      (b) The largest 5-digit number = 99999

(c) The smallest 7-digit number = 10000000      (d) The largest 6-digit number = 999999

Relation between (a) and (b) 1000000 is a successor of 99999 while 1000000 is successor of 999999.

2. Fill in the blanks :

(a) The smallest natural number is **1**.

(b) The smallest whole number is **0**.

(c) **0** is less than every natural number.

(d) The successor of the largest 2-digit number **100**.

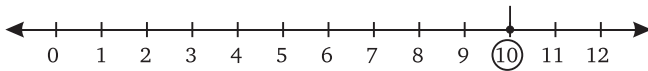
(e) The predecessor of the smallest 3-digit number is **99**.



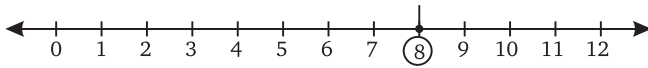


3. Represent the following numbers on the number line :

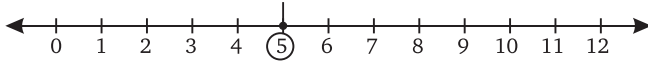
(a) 10



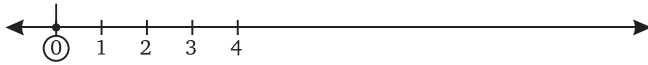
(b) 8



(c) 5



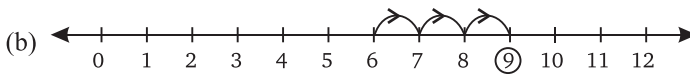
(d) 0



4. Using number line find the following :



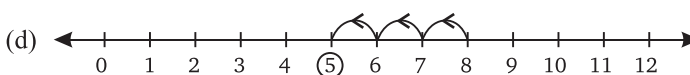
$$2 + 5 = 7$$



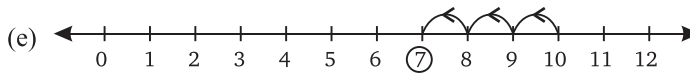
$$6 + 3 = 9$$



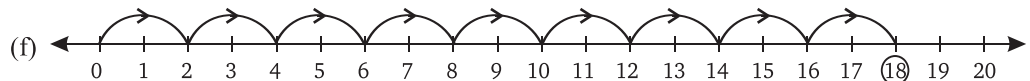
$$5 + 6 = 11$$



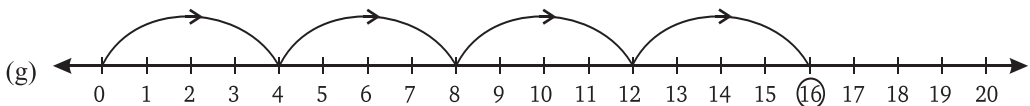
$$8 - 3 = 5$$



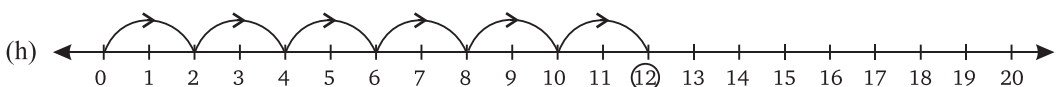
$$10 - 3 = 7$$



$$2 \times 9 = 18$$



$$4 \times 4 = 16$$



$$6 \times 2 = 12$$

5. Arrange the following in descending order :
- (a) Twenty lakh, one crore, one million, 999999  
or 2000000, 1000000, 1000000, 999999 arrange in in descending order  
 $1000000 > 1000000 > 2000000 > 999999$
- (b) 920390, 902903, 9009203, 900392 arrange in descending order.  
 $9009203 > 920390 > 900392 > 902903$
6. Arrange the following in ascending order :
- (a)  $50270 < 70250 < 73250 < 75020$
- (b)  $10180 < 11850 < 58110 < 85110$

## Exercise-2.2

1. Fill in the boxes :
- (a)  $0 + 515 = 515$  (b)  $5 + (105 + 2) = (5 + 105) + 2$
- (c)  $195 \times 405 = 405 \times 195$  (d)  $5 \times 92 \times 20 = 100 \times 92$
- (e)  $751 \div 751 = 1$  (f)  $128 \times (100 - 2) = 128 \times 100 - 128 \times 2$
2. Find the values of the following :
- (a)  $952 \times 15 - 5 \times 952$  (b)  $562 \times 4 \times 80 + 281 \times 20 \times 8 \times 4$   
 $= 952 \times (15 - 5)$   
 $= 952 \times 10$   
 $= 9520$   
 $= 562 \times 4 \times 80 + 281 \times 80 \times 8$   
 $= 80(562 \times 4 + 281 \times 8)$   
 $= 80(2248 + 2248)$   
 $= 80 \times 4496 = 359680$
- (c)  $697 \times 25 \times 282 + 3485 \times 5 \times 718$  (d)  $(639 \div 639) + (4250 + 425)$   
 $= 697 \times 25 \times 282 + 17425 \times 718$   
 $= 25(697 \times 282 + 697 \times 718)$   
 $= 25 \times 697(282 + 718)$   
 $= 25 \times 697 \times 1000$   
 $= 697 \times 25000 = 17425000$   
 $= 1 + 4675$   
 $= 4676$
- (e)  $(279 \div 279) + 999$  (f)  $(7569 \div 7569) + (99 \div 9)$   
 $= 1 + 999$   
 $= 1000$   
 $= 1 + 11$   
 $= 12$
3. Name the property :
- (a) Closure property of addition  
 (b) Associative property of addition  
 (c) Distribute property
4. Find the sum using suitable rearrangement of numbers :
- (a)  $266 + 508 + 234$  (b)  $205 + 196 + 104 + 95$  (c)  $521 + 378 + 79 + 122$   
 $= 266 + 234 + 508$   
 $= 500 + 508$   
 $= 1008$   
 $= (205 + 95) + (196 + 104)$   
 $= 300 + 300$   
 $= 600$   
 $= 521 + 79 + 122 + 378$   
 $= 600 + 500$   
 $= 1100$
5. If  $a = 256$ ,  $b = 362$  and  $c = 182$ , show that  $a - (b - c) \neq (a - b) - c$ .

Given value of  $a = 256$ ,  $b = 362$ ,  $c = 182$

$$\begin{aligned}
 a - (b - c) &= 256 - (362 - 182) \\
 &= 256 - 180 = 76 \\
 (a - b) - c &= (256 - 362) - 182 \\
 &= -106 - 182 = -288 \\
 76 &\neq -288 \\
 a - (b - c) &\neq (a - b) - c
 \end{aligned}$$

Hence proved.

6. In the sums given below replace the \* with suitable digits.

$$\begin{array}{r} * * 2 3 \\ - 5 7 * * \\ \hline 1 5 0 5 \end{array}$$

In first column we know that  $3 - * = 5$   
 $13 - 8 = 5$

$$* = 8$$

In second column  $2 - 1 - * = 0$

$$1 - * = 0$$

$$* = 1 - 1 = 0$$

$$* = 1$$

In third column or  $* - 7 = 5$   
 $5 + 7 = 12$

$$* = 2$$

In fourth column  $* - 5 = 1$

$$1 + * - 5 = 1$$

$$* = 1 + 5 + 1$$

$$* = 7$$

$$\begin{array}{r} * * 2 3 \\ - 5 7 * * \\ \hline 1 5 0 5 \end{array} \Rightarrow \begin{array}{r} 7 2 2 3 \\ - 5 7 1 8 \\ \hline 1 5 0 5 \end{array}$$

$$\begin{array}{r} 8 9 * * \\ - * * 6 5 \\ \hline 6 3 1 7 \end{array}$$

In first column  $* - 5 = 7$

We know  $12 - 5 = 7$

$$* = 7$$

In second column  $* - 6 = 1$

$$* - 1 - 6 = 1$$

$$* = 6 + 1 + 1 = 8$$

$$* = 8$$

In third column  $9 - * = 3$

$$* = 9 - 6 = 3$$

$$* = 6$$

In fourth column  $8 - * = 6$

$$8 - 2 = 6$$

$$* = 2$$

$$\begin{array}{r} 8 9 * * \\ - * * 6 5 \\ \hline 6 3 1 7 \end{array} \Rightarrow \begin{array}{r} 8 9 8 2 \\ - 2 6 6 5 \\ \hline 6 3 1 7 \end{array}$$

$$\begin{array}{r} 7 6 5 9 \\ - * * 2 8 \\ \hline 5 8 * * \end{array}$$

In first column  $9 - 8 = * = 9 - 8 = 1$   $* = 1$

In column  $5 - 2 = *$

Second  $5 - 2 = 3$   $* = 3$

In third column  $6 - * = 8$

$$16 - 8 = 8$$
  $* = 8$

In fourth column  $7 - * = 5$

$$7 - 1 - * = 5$$

$$6 - * = 5$$

$$* = 6 - 5 = 1$$
  $* = 1$

$$\begin{array}{r} 7 6 5 9 \\ - * * 2 8 \\ \hline 5 8 * * \end{array} \Rightarrow \begin{array}{r} 7 6 5 9 \\ - 1 8 2 8 \\ \hline 5 8 3 1 \end{array}$$

$$\begin{array}{r} * * * * \\ + 2 4 6 8 \\ \hline 8 0 2 0 \end{array} \quad \begin{array}{r} 8 0 2 0 \\ - 2 4 6 8 \\ \hline 5 5 5 2 \end{array}$$

(when we subtract one get of addend from the sum, we get other set of addend)

$$\begin{array}{r} \text{(e)} \quad 7 * 4 * \\ + * 8 6 9 \\ \hline 9 6 1 6 \end{array}$$

In first column =  $* + 9 = 16$   
 $* = 16 - 9 = 7 \quad * = 7$

In third column =  $* + 8 + 1 = 16$   
 $* = 16 - 9 = 7 \quad * = 7$

In fourth column =  $7 + 1 + * = 9$   
 $9 - 7 + 1 = 1 \quad * = 1$

$$\begin{array}{r} 7 * 4 * \\ + * 8 6 9 \\ \hline 9 6 1 6 \end{array} \Rightarrow \begin{array}{r} 7 7 4 7 \\ + 1 8 6 9 \\ \hline 9 6 1 6 \end{array}$$

$$\begin{array}{r} \text{(f)} \quad 2 * 7 5 \\ + * 5 6 9 \\ \hline 7 9 * * \end{array} \quad \begin{array}{l} \text{In first column} = 5 + 9 = * \\ 5 + 9 = 14 \\ * = 4 \\ \text{In second column} = 7 + 6 = * \\ = 7 + 6 + 1 = 14 \quad * = 4 \\ \text{In third column} = * + 1 + 5 = 9 \\ * = 9 - 6 = 3 \quad * = 3 \\ \text{In fourth column} = 2 + * = 7 \\ 7 - 2 = 5 \quad * = 5 \end{array}$$

$$\begin{array}{r} 2 * 7 5 \\ + * 5 6 9 \\ \hline 7 9 * * \end{array} \Rightarrow \begin{array}{r} 2 3 7 5 \\ + 5 5 6 9 \\ \hline 7 9 4 4 \end{array}$$

7. Divide and check using relation-dividend = (divisor  $\times$  quotient) + remainder :

(a)  $456 \div 17$

$$\begin{array}{r} 17 \overline{)456} \quad 26 \\ -34 \\ \hline 116 \\ -102 \\ \hline 14 \end{array}$$

Divisor = 17, quotient = 26

Remainder = 14

Check :

Dividend = (D  $\times$  Q) + R

$$\begin{aligned} 456 &= (17 \times 26) + 14 \\ &= 442 + 14 \\ &= 456 \end{aligned}$$

(b)  $259 \div 13$

$$\begin{array}{r} 13 \overline{)259} \quad 19 \\ -13 \\ \hline 129 \\ -117 \\ \hline 12 \end{array}$$

Divisor = 13, Quotient = 19

Remainder = 12

Check :

Dividend = D  $\times$  Q + R

$$\begin{aligned} 259 &= 13 \times 19 + 12 \\ &= 247 + 12 \\ &= 259 \end{aligned}$$

8. Find the difference between the largest 5 digit number and smallest 3 digit number.

**Ans.** The largest 5-digit number = 99999

The smallest 3-digit number = 100

Difference =  $99999 + 100 = 100099$

9. A shopkeeper sold 7 bed-sheets for ₹ 350 each and 13 pillow covers for ₹ 50 each. Find the amount he earned by selling the bed-sheets and pillow covers.

**Ans.**

$$\begin{aligned} \text{Cost of 1 bed sheet} &= ₹ 350 \\ \text{Cost of 7 bed sheets} &= ₹ 350 \times 7 \\ \text{Cost of 1 pillow} &= ₹ 50 \\ \text{Cost of 13 pillow} &= ₹ 50 \times 13 \\ \text{Total cost of both} &= 7 \times 350 + 13 \times 50 \\ &= 50(7 \times 7 + 13) \\ &= 50 \times (49 + 13) = 50 \times 62 = 3100 \end{aligned}$$

Thus shopkeeper earning ₹ 3100.

10. In a plate there were 9 sweets each. 3 of the sweets in each plate were rosogullas and the remaining were burfees. How many burfees are there in 7 plates? Write the mathematical statement.

**Ans.**

$$\begin{aligned} \text{Number sweets in each} &= 9 \\ \text{Number of rosogullas} &= 3 \\ \text{Number of burfees} &= 9 - 3 = 6 \\ \text{Number of burfees in 7 plate} &= (9 - 3)7 = 6 \times 7 = 42 \end{aligned}$$

11. I am a number between 20 and 30. If you divide 47 and 92 by me, the remainders are 3 and 4, respectively. What number am I?

**Ans.** Let the dividend be  $x$

Now, according to question,

By dividing 47 by  $x$ ; 3 got as remainder.  
By dividing 42 by  $x$ ; 4 got as remainder.

So,  $47 - 3 = 44$  and  $92 - 4 = 88$

Only 22 is number between 20 and 30 which is divisible by 44 and 88.

$$\begin{aligned} 44 \div 22 &= 4 \\ 88 \div 22 &= 4 \end{aligned}$$

Then I am number 22.

12. What number am I?

**Ans.** I am a number between 10 and 20. If you divide 100 or 122 by me, the remainder is 1.

Let the me  $x$

Now, according to question;

By dividing 100; 1 got as remainder.  
By dividing 122; 1 got as remainder.

So  $100 - 1 = 99$  and  $122 - 1 = 121$

Only 11 is number between 100 and 122 which is divisible by 99 and 121

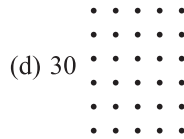
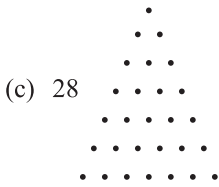
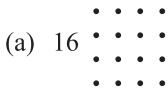
$$\begin{aligned} 99 \div 11 &= 9 \\ 121 \div 11 &= 11 \end{aligned}$$

I am number 11.

## Exercise-2.3

1. Represent numbers from 24 to 30 according to rectangular, square or triangular patterns.  
Numbers that can be represented as rectangle = 24, 26, 27, 28, 30  
Numbers that can be represented as squares = 25  
Numbers that can be represented as triangle = 28

2. Write the following numbers as directed using dots :



3. Study the following pattern :

(a) First 12 odd numbers.

According to given pattern, first 12 odd number

$$= 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 = (12)^2 = 144$$

(b) First 50 odd numbers.

According to given pattern

$$\text{First 50 odd number} = 1 + 3 + 5 + 7 + 9 + 11 + \dots = (50)^2 = 2500$$

4. Observe the following patterns and the missing numbers :

(a)

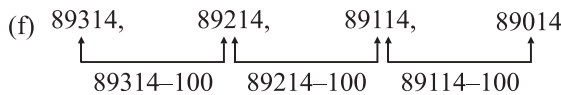
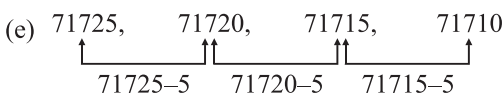
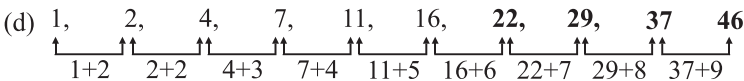
$$\begin{aligned} 1 \times 11 &= 11 \\ 11 \times 11 &= 121 \\ 111 \times 11 &= 1221 \\ 1111 \times 11 &= 12221 \\ \mathbf{11111 \times 11} &= \mathbf{122221} \\ \mathbf{111111 \times 11} &= \mathbf{1222221} \end{aligned}$$

(b)

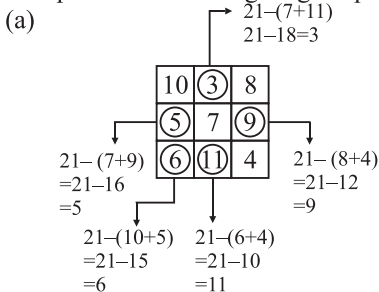
$$\begin{aligned} 37 \times 3 &= 111 \\ 37 \times 6 &= 222 \\ 37 \times 9 &= 333 \\ 37 \times 12 &= 444 \\ \mathbf{37 \times 15} &= \mathbf{555} \\ \mathbf{37 \times 16} &= \mathbf{666} \end{aligned}$$

(c)

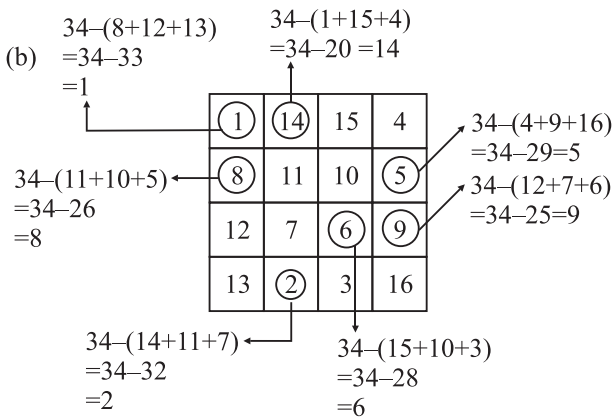
$$\begin{aligned} 9 \times 9 + 7 &= 88 \\ 9 \times 98 + 6 &= 888 \\ 9 \times 987 + 5 &= 8888 \\ \mathbf{9 \times 9876 + 3} &= \mathbf{88888} \\ 9 \times 9876 + 4 &= 888888 \end{aligned}$$



5. Complete the following magic squares :



Sum of diagonal =  $10 + 7 + 4 = 21$   
 We know the sum of diagonal = Sum of rows and sum of columns.  
 So, required number.



Sum of diagonal =  $13 + 7 + 10 + 4 = 34$   
 We know the sum of diagonal = sum of rows and sum of columns.  
 So, required number.

**I. MCQs : Choose the correct option :**

1. (c)      2. (b)      3. (a)      4. (c)      5. (d)      6. (a)      7. (b)

**II. Fill in the blanks :**

1. If any two whole numbers are added, we always get a **whole** number.  
This property is called the **closure** property of addition of whole numbers.
2. If any two whole numbers  $a$  and  $b$  are added,  $a$  to  $b$  or  $b$  to  $a$ , the **sum** is always **same**.  
This property is called **commutative** property of addition of whole numbers.
3. If **zero** is added to a number, the sum will remain the same. Hence **zero** is called the **additive identity** in the whole numbers.
4. When whole numbers are subtracted, say  $6 - 9 =$  does not have a value in whole numbers.  
Hence **closure** property does not exist in subtraction.
5.  $(7 - 3) - 2 \neq 7 - (3 - 2)$   
so **associative** property does not hold true.

**Mental Maths**

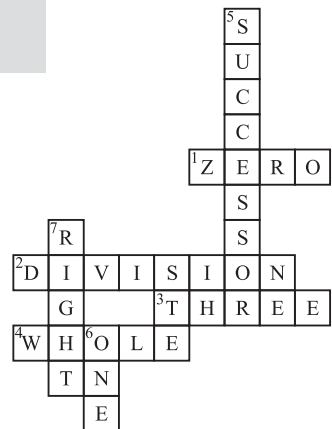
1.  $550 \times 50 \times 2 = 550 \times (50 \times 2) = 550 \times 100 = 55000$
2.  $8 \times 1 = 1 \times 8 = 8$   
This property known as multiplication identity.
3.  $8652 \div 206 = 42$   
Fact of dividend  
 $206 \times 42 = 8652$       and       $42 \times 206 = 8632$

**Puzzle**

Fill in the blanks to fill the crossword.

ACROSS →

1. **Zero** is a additive identity of whole numbers.
2. Closure property of whole numbers does not hold true for **Division**.
3. The only prime number that can be represented as a triangle is **three**.
4. All natural numbers are **whole** numbers except zero.





DOWN ↓

- To obtain the **successor** of a number, 1 is added to the number.
- Number **one** has no predecessor in natural numbers.
- Addition on number line involves, moving to the **right** of the number on the number line.



# Playing with Numbers

## 3

### Exercise-3.1

- Write all factors of the following number.

**Ans.** (a) Factors of 16

We know that;  $1 \times 16 = 16$ ,  $2 \times 8 = 16$ ,  $4 \times 4 = 16$   
Thus all factors of 16 are 1, 2, 4, 8, 16.

- Factors of 125

We know that;  $1 \times 125 = 125$ ,  $5 \times 25 = 125$   
Thus all factors of 125 are 1, 5, 25 and 125.

- Factors of 729

We know that;  $1 \times 729 = 729$ ,  $3 \times 243 = 729$ ;  $9 \times 81 = 729$ ,  $27 \times 27 = 729$ .  
Thus all factors of 729 are 1, 3, 9, 81, 27, 243, 729.

- Write the first four multiples of each :

**Ans.** (a) The first four multiples are :  $12 \times 1 = 12$ ,  $12 \times 2 = 24$ ,  $12 \times 3 = 36$ ,  $12 \times 4 = 48$   
12, 24, 36 and 48 are four multiples of 12.

- The first four multiples are :  $17 \times 1 = 17$ ,  $17 \times 2 = 34$   
 $17 \times 3 = 51$ ,  $17 \times 4 = 68$   
17, 34, 51 and 68 are four multiples of 17.

- Fill in the blanks.

**Ans.** (a) **2** is the smallest prime number.

- 4** is the smallest composite number.

- 0** is the smallest even number.

- 1 is neither a **prime** nor a **composite** number.

- Every number is a **factor** and **multiple** of itself.

- A number which has only two factors is called a **prime numbers**.

- A number which having more than two factors is called **composite** number.

- Write down the twin-primes between 40 and 50.

**Ans.** We know that two consecutive odd prime number are twin primes. So, twin prime in between 40 to 50 is 41 and 43.

- Express each of the following as a sum of two odd primes :

**Ans.** (a) Sum of 13 and 17 which are add primes  $13 + 17 = 30$

- Sum of 3 and 61 which are odd primes  $3 + 61 = 64$

- Sum of 19 and 79 which are odd primes  $19 + 79 = 98$

- Which of the following pairs are co-primes?

**Ans. Co-prime :** Two whole numbers are said to be co-prime if they have no common factor other than 1.  
So, (27, 36) and (10, 21) are co-prime.



7. Write 221 as a product of two prime numbers.

**Ans.** Multiplication of 13 and 17

$$13 \times 17 = 221$$

8. Find one perfect number between 1 and 30 except 6.

**Ans.** If the sum of all the factors of a number is twice the number, the number is called a perfect number. For example, 28 is a perfect number.

Factors of 28 are 1, 2, 4, 7, 14 and 28.

$$\text{Sum of the factors} = 1 + 2 + 4 + 7 + 14 + 28 = 56$$

$$\text{Twice times of 28} = 28 \times 2 = 56$$

9. Show that 1701 and 4400 are co-primes.

**Ans.** Factors of 1701 = 1, 3, 7, 9, 21, 27, 63, 81, 189, 243, 567, 1701

Factors of 4400 = 1, 2, 4, 5, 8, 10, 11, 16, 20, 22, 25, 40, 44, 50, 55, 80, 88, 100, 110, 176, 200, 220, 275, 400, 440, 550, 880, 1100, 2200, 4400

We know that the two whole numbers have no common factor other than 1.

We see that 1 is common factor in 1701 and 4400. So 1701 and 4400 are co-prime factors.

10. Write down two prime numbers whose difference is (a) 1 (b) 3.

**Ans.** (a) Two prime number = 2 and 3

$$\text{Difference} = 3 - 2 = 1$$

(b) Two prime number = 5 and 2

$$\text{Difference} = 5 - 2 = 3$$

11. Which is the largest prime number less than 99?

**Ans.** 97 is the largest prime number less than 99.

12. Write down the prime numbers between :

**Ans.** (a) Prime number between 1 and 20 = 2, 3, 5, 7, 11, 13, 17, 19.

(b) Prime number between 28 and 44 = 29, 31, 37, 41, 43.

(c) Prime number between 90 and 120 = 97, 101, 103, 107, 109, 113.

13. Which is the smallest odd composite number?

**Ans.** 9 is the smallest odd composite number.

14. Write two prime number whose product is the biggest even number less than 16.

**Ans.** 2 and 7 is two prime number whose product is biggest even less than 16.

15. Write True (T) or False (F) for the following

**Ans.** (a) F (b) T (c) F (d) F (e) T

## Exercise-3.2

1. Test whether the following numbers are divisible by 2, 3, 4, 5, 6, 9, 10, 11 (write ✓ or ✗).

**Ans.**

	Numbers	2	3	4	5	6	9	10	11
(a)	252	✓	✓	✓	✗	✓	✓	✗	✗
(b)	58332	✓	✓	✓	✗	✓	✗	✗	✗
(c)	33125	✗	✗	✗	✓	✗	✗	✗	✗
(d)	422381	✗	✗	✗	✗	✗	✗	✗	✗

(e)	7431	X	✓	X	X	X	X	X	X
(f)	35931	X	✓	X	X	✓	X	X	X
(g)	8734	✓	X	X	X	X	X	X	✓
(h)	542367	X	✓	X	X	X	✓	X	X
(i)	7473	X	X	X	X	X		X	X
(j)	92376	✓	✓	X	X	✓	✓	X	X

2. Fill the \* with the smallest digit to make the number divisible by 3 :

Ans. (a) Let \* is  $x$

$$\text{Number} = 6x247$$

$$\text{Sum of digit} = 6 + x + 2 + 4 + 7 = 19$$

The next number nearest to 19 which is divisible by 3 is 21.

Difference =  $21 - 19 = 2$  which is required number.

Hence, the number which is divisible by 3 is 62247.

(b) Let \* is  $x$

$$\text{Number } 47x93$$

$$\text{Sum of digit} = 4 + 7 + x + 9 + 3 = 23$$

The next number nearest to 23 which is divisible by 3 is 24.

Difference =  $24 - 23 = 1$  which is required number.

Hence the number which is divisible by 3 is 47193.

3. Fill the \* with the smallest digit to make the number divisible by 9 :

Ans. (a) We have \* 7868. Let \* is  $x$

$$\text{The sum of digits} = x + 7 + 8 + 6 + 8 = 29$$

The next number nearest to 29 which is divisible by 9 is 36.

$\therefore$  Difference =  $36 - 29 = 7$  which is the required number.

Hence, the number which is divisible by 9 is 77868

(b) We have  $93 * 7$ . Let \* is  $x$ .

$$\text{The sum of digits} = 9 + 3 + x + 7 = 19 + x$$

The number nearest to 19 which is divisible by 9 is 27.

Difference =  $27 - 19 = 8$  which is the required number.

Hence, the number which is divisible by 9 is 9387.

4. Fill the \* with the smallest digit to make the number divisible by 11 :

Ans. (a)  $304 * 5$  is divisible by 11

Let \* is  $x$

$$\text{Now number} = 304x5$$

According to rule  $\rightarrow$  difference between sum its digits in odd place and its even place is either 0 or a multiple of 11. Number is divisible by 11.

$$\text{Sum of odd place} = 0 + x = x$$

$$\text{Sum of even place} = 3 + 4 + 5 = 12$$

$$\text{Difference between odd place and even place} = 12 - x$$

For given number to be divisible by 11 we have  $12 - x = 11$

$$\text{and} \quad 12 - 1 = 11$$

So, value of  $x = 1$

Number 30415 is divisible by 11.

(b)  $7 * 3593$  is divisible by 11

Let \* is  $x$

$$\text{Now, number} = 7x3593$$

According to rule : Difference between sum its digits in odd place and its even place is either 0 or a multiple of 11. Number is divisible by 11

$$7x \ 3593$$

Sum of odd place =  $7 + 3 + 9 = 19$

Sum of even difference of place =  $x + 5 + 3 = x + 8$

odd place and even place =  $19 - (x + 8) = 19 - x - 8 = 11 - x$

For given number to be divisible by 11 we get  $11 - x = 11$

and

$$11 - 11 = 0$$

So,

$$\text{value of } x = 0$$

Number 703593 is divisible by 11.

5. Is 2430780 divisible by 7?

**Ans.** In the number,

The difference between twice the digit at once place and the number formed by other digits is either zero or a multiple of 7.

Number 2430780. Its we remove 0

$$\text{Next step} = 24307 - 8 \times 2 = 24307 - 16 = 24291$$

$$\text{Then } 2429 - 1 \times 2 = 2429 - 2 = 2427$$

$$242 - 2 \times 7 = 242 - 14 = 228$$

$$22 - 8 \times 2 = 22 - 16 = 4$$

4 is not a multiples of 7. So, 2430780 is not divisible by 7.

6. A number is divisible by both 5 and 12. By which other number will that number be always divisible?

**Ans.** 5 and 2 is co-prime number product of 5 and 12 =  $5 \times 12 = 60$

So, we say that 60 is a number is divisible by both 5 and 12.

7. Which of the following numbers are prime numbers?

**Ans.** Prime number : Natural numbers (greater than 1) which have only two factors, viz. 1 and the number itself are called prime number.

So, (a) 53, (c) 149, (e) 299, (f) 577, (h) 263

8. Add 99 and 108 and find whether the result is prime or not.

**Ans.** Add 99 and 108 =  $99 + 108 = 207$

Thus, 207 is not prime.

9. Is 439 a prime number ? If yes, give reason.

**Ans.** By applying the tests of divisibility, we find that 439 is not divisible only by any of the prime numbers 2, 3, 5 and 7. So, 439 is a prime number.

10. Find the largest number that you need to test as a divisor to determine whether each of the following is a prime number :

**Ans.** (a) 101 Test the divisibility of 101 by each one of the prime numbers 2, 3, 5, 7, 11 and 13 we find that 101 is not divisible by any of them we find that now,  $7 \times 7 = 49$  ;  $11 \times 11 = 121$ ;  $13 \times 13 = 169$ .

(b) 111 We know that 111 has a factors of 1, 3, 37 and 11.

So it is not a prime numbers.

(c) 397

We test the divisibility of 397 by each one of the prime numbers 2, 3, 7, 11, 13, 17, 19 and 23.

We find that 397 is not divisible by any of them.

We find that now,  $17 \times 17 = 289$ ,  $19 \times 19 = 361$ ,  $23 \times 23 = 529$

So, we have to check till 19 as a greater prime number for divisibility of 397.

11. Write True (T) or False (F) for the following :

Ans. (a) F (b) T (c) F (d) T

## Exercise-3.3

1. Write the prime factorisation of the following number :

Ans. (a) 

2	120
2	60
2	30
3	15
5	5
	1

(b) 

3	225
3	75
5	25
5	5
	1

(c) 

2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

Prime factors of

$$120 = 2 \times 2 \times 2 \times 3 \times 5$$

Prime factors of

$$225 = 3 \times 3 \times 5 \times 5$$

Prime factors of

$$256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

(d) 

2	2448
2	1224
2	612
2	306
3	153
3	51
17	17
	1

(e) 

3	4335
5	1445
17	289
17	17
	1

(f) 

2	9282
3	4641
7	1547
13	221
17	17
	1

Prime factors of 2448

$$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 17$$

Prime factors of

$$4335 = 3 \times 5 \times 17 \times 17$$

Prime factors of

$$9282 = 2 \times 3 \times 7 \times 13 \times 17$$

(g) 

2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

(h) The greatest 4-digit Number = 9999

3	9999
3	3333
11	1111
101	101
	1

Prime factors of 9999

$$= 3 \times 3 \times 11 \times 101$$

Prime factor  $1024 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

2. Write the smallest and the largest 4-digit numbers and determine the prime factorisation of each.

The smallest 4-digit number = 1000

2	1000
2	500
2	250
5	125
5	25
5	5
	1

The largest 4-digit number = 9999

3	9999
3	3333
11	1111
101	101
	1

Prime factors of 9999 =  $3 \times 3 \times 11 \times 101$

Prime factor of 1000 =  $2 \times 2 \times 2 \times 5 \times 5 \times 5$

3. Find the smallest number having 5 different Prime factors.

**Ans.** Five smallest prime factor = 2, 3, 5, 7, 11

Multiple of 2, 3, 5, 7, 11 =  $2 \times 3 \times 5 \times 7 \times 11 = 2310$

So, required number = 2310.

### Exercise-3.4

1. Find the common factors of :

- Ans.** (a) Factors of 35 = ①, ⑤, 7, 35  
 Factors of 50 = ①, 2, ⑤, 10, 25, 50  
 Common factors of 35 and 50 = 1, 5
- (b) Factors of 50 = ①, ②, ⑤, ⑩, 25, 50  
 Factors of 120 = ①, ②, 3, 4, ⑤, 6, 8, ⑩, 12, 15, 20, 24, 40, 30, 60, 120  
 Common factors of 50 and 120 = 1, 2, 5, 10
- (c) Factors of 4 = ①, ②, ④  
 Factors of 8 = ①, ②, ④, 8  
 Factors of 12 = ①, ②, 3, ④, 6, 12  
 Common factors of 4, 8 and 12 = 1, 2, 4
- (d) Factors of 6 = ①, ②, ③, ⑥  
 Factors of 12 = ①, ②, ③, 4, ⑥, 12  
 Factors of 36 = ①, ②, ③, 4, ⑥, 9, 21, 18, 36  
 Common factors of 6, 12 and 36 = 1, 2, 3, 6

2. Find first three common multiples of:

- Ans.** (a) Multiples of 4 = 4, 8, ⑫, 16, 20, ⑲, 28, 32, ⑳, 40  
 Multiples of 6 = 6, ⑫, 18, ⑲, 30, ⑳, 42, 48,.....  
 First three common multiples = 12, 24, 36
- (b) Multiples 12 = 12, 24, ⑳, 48, 60, ⑲, 84, 96, ⑳  
 Multiples 18 = 18, ⑳, 54, ⑲, 90, ⑳, 126, 144,.....  
 First three common multiples 36, 72, 108.

- (c) Multiples 3 = 3, 6, 9, 12, 15, 18, 21, 27,  $\textcircled{30}$ , 33, 36, 39, 42, 45, 48, 51, 54, 57,  $\textcircled{60}$ , 63, 66, 69, 72, 75, 78, 81, 84, 87,  $\textcircled{90}$   
 Multiples of 5 = 5, 10, 15, 20, 25,  $\textcircled{30}$ , 35, 40, 45, 50, 55,  $\textcircled{60}$ , 65, 70, 75, 80, 85,  $\textcircled{90}$ , 95  
 Multiples of 6 = 6, 12, 18, 24,  $\textcircled{30}$ , 36, 42, 48, 54,  $\textcircled{60}$ , 66, 72, 78, 84,  $\textcircled{90}$   
 First three common multiples = 30, 60, 90.
- (d) Multiples 2 = 2, 4, 6,  $\textcircled{8}$ , 10, 12, 14,  $\textcircled{16}$ , 18, 20, ...  $\textcircled{24}$ ..... 28, ...  $\textcircled{32}$ , 36.....  
 Multiples of 4 = 4,  $\textcircled{8}$ ,  $\textcircled{16}$ , 20,  $\textcircled{24}$ , 28,  $\textcircled{32}$ , 36 .....  
 Multiples of 8 =  $\textcircled{8}$ ,  $\textcircled{16}$ ,  $\textcircled{24}$ ,  $\textcircled{32}$ , 36 .....  
 First three common multiples = 8, 16, 24, 32.

3. Determine the HCF of the following numbers by prime factorization method.

Ans. (a) Prime factors of 36, 84

2	36
2	18
3	9
3	3
	1

Prime factors 36 =  $\textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 3$   
 HCF of 36 and 84 =  $2 \times 2 \times 3 = 12$

2	84
2	42
3	21
7	7
	1

Prime factor 84 =  $\textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 7$

(b)

3	81
3	27
3	9
3	3
	1

Prime factors of 81 =  $\textcircled{3} \times \textcircled{3} \times 3 \times 3$   
 HCF of 81 and 117 =  $3 \times 3 = 9$

3	117
3	39
13	13
	1

Prime factors of 117 =  $\textcircled{3} \times \textcircled{3} \times 13$

(c)

3	39
13	13
	1

Prime factors of 39 =  $3 \times \textcircled{13}$   
 HCF of 39 and 52 = 13

2	52
2	26
13	13
	1

Prime factors of 52 =  $2 \times 2 \times \textcircled{13}$

(d)

2	20
2	10
5	5
	1

2	170
5	85
17	17
	1

2	520
2	260
2	130
5	65
13	13
	1



Prime factors of 20 =  $2 \times 2 \times 5$   
 Prime factors of 170 =  $2 \times 5 \times 17$   
 Prime factors of 520 =  $2 \times 2 \times 2 \times 5 \times 13$   
 HCF of 20, 17 and 520 =  $2 \times 5 = 10$

(e)	<table border="1" style="border-collapse: collapse; text-align: center;"><tr><td style="padding: 5px;">2</td><td style="padding: 5px;">14</td></tr><tr><td style="padding: 5px;">7</td><td style="padding: 5px;">7</td></tr><tr><td style="padding: 5px;"></td><td style="padding: 5px;">1</td></tr></table>	2	14	7	7		1	<table border="1" style="border-collapse: collapse; text-align: center;"><tr><td style="padding: 5px;">2</td><td style="padding: 5px;">42</td></tr><tr><td style="padding: 5px;">3</td><td style="padding: 5px;">21</td></tr><tr><td style="padding: 5px;">7</td><td style="padding: 5px;">7</td></tr><tr><td style="padding: 5px;"></td><td style="padding: 5px;">1</td></tr></table>	2	42	3	21	7	7		1	<table border="1" style="border-collapse: collapse; text-align: center;"><tr><td style="padding: 5px;">2</td><td style="padding: 5px;">84</td></tr><tr><td style="padding: 5px;">2</td><td style="padding: 5px;">42</td></tr><tr><td style="padding: 5px;">3</td><td style="padding: 5px;">21</td></tr><tr><td style="padding: 5px;">7</td><td style="padding: 5px;">7</td></tr><tr><td style="padding: 5px;"></td><td style="padding: 5px;">1</td></tr></table>	2	84	2	42	3	21	7	7		1
2	14																										
7	7																										
	1																										
2	42																										
3	21																										
7	7																										
	1																										
2	84																										
2	42																										
3	21																										
7	7																										
	1																										

Prime factors 14 =  $2 \times 7$   
 Prime factors 42 =  $2 \times 3 \times 7$   
 Prime factors 84 =  $2 \times 2 \times 3 \times 7$   
 HCF of 14, 42 and 84 =  $2 \times 7 = 14$

(f)	<table border="1" style="border-collapse: collapse; text-align: center;"><tr><td style="padding: 5px;">3</td><td style="padding: 5px;">69</td></tr><tr><td style="padding: 5px;">23</td><td style="padding: 5px;">23</td></tr><tr><td style="padding: 5px;"></td><td style="padding: 5px;">1</td></tr></table>	3	69	23	23		1	<table border="1" style="border-collapse: collapse; text-align: center;"><tr><td style="padding: 5px;">11</td><td style="padding: 5px;">253</td></tr><tr><td style="padding: 5px;">23</td><td style="padding: 5px;">23</td></tr><tr><td style="padding: 5px;"></td><td style="padding: 5px;">1</td></tr></table>	11	253	23	23		1
3	69													
23	23													
	1													
11	253													
23	23													
	1													

Prime factors of 69 =  $3 \times 23$   
 Prime factors of 253 =  $11 \times 23$   
 HCF of 69 and 253 = 23

4. Determine the LCM of each of the following :

**Ans.** (a) 

2	12
2	6
3	3
	1

2	20
2	10
5	5
	1

Prime factors of 12 =  $2 \times 2 \times 3$   
 Prime factors of 20 =  $2 \times 2 \times 5$   
 We observe that 2 occurs as prime factor maximum two times, 3 and 5 occurs only once.  
 Hence, the required LCM is  $2 \times 2 \times 3 \times 5 = 60$

(b) 

2	20
2	10
5	5
	1

2	36
2	18
3	9
3	3
	1

Prime factors of 20 =  $2 \times 2 \times 5$   
 Prime factors of 36 =  $2 \times 2 \times 3 \times 3$   
 We observe that 2 and 3 occurs as prime factor maximum two times 5 occurs only once.  
 Hence, the required LCM is  $2 \times 2 \times 3 \times 3 \times 5 = 180$

(c)	3	49, 63, 84	
	3	49, 21, 28	
	4	49, 7, 28	
	7	49, 7, 7	
	7	7, 1, 1	
		1, 1, 1	LCM of 49, 63 and 84 = $3 \times 3 \times 4 \times 7 \times 7 = 1764$
(d)	2	81, 126, 135, 252	
	2	81, 63, 135, 126	
	3	81, 63, 135, 63	
	3	27, 21, 45, 21	
	3	9, 7, 15, 7	
	3	3, 7, 5, 7	
	5	1, 7, 5, 7	
	7	1, 7, 1, 7	LCM of 81, 126, 135 and 252
		1, 1, 1, 1	= $2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5 \times 7 = 11340$

5. Find the HCF of the following numbers by continued division method :

Ans. (a) HCF of 513 and 783

$$\begin{array}{r}
 513 \overline{)783} (1 \\
 \underline{-513} \\
 270 \overline{)513} (1 \\
 \underline{-270} \\
 243 \overline{)270} (1 \\
 \underline{243} \\
 27 \overline{)243} (9 \\
 \underline{-243} \\
 0
 \end{array}$$

Now, the HCF of 513 and 783 is 27.

(b) HCF of 1260 and 2376

$$\begin{array}{r}
 1260 \overline{)2376} (1 \\
 \underline{-1260} \\
 1116 \overline{)1260} (1 \\
 \underline{-1116} \\
 144 \overline{)1116} (7 \\
 \underline{-1008} \\
 108 \overline{)144} (1 \\
 \underline{-108} \\
 0
 \end{array}$$

HCF of 1260 and 2376 is 36.

(c) HCF of 2628 and 8541

$$\begin{array}{r} 2628 \overline{)8541} \quad (3 \\ \underline{-7884} \\ 657 \overline{)2628} \quad (4 \\ \underline{-2628} \\ 0 \end{array}$$

HCF of 2628 and 8541 is 657.

(d) HCF of 1197, 1311 and 627.

HCF of 1311 and 1197

$$\begin{array}{r} 1197 \overline{)1311} \quad (1 \\ \underline{-1197} \\ 114 \overline{)1197} \quad (10 \\ \underline{-1140} \\ 57 \overline{)114} \quad (2 \\ \underline{-114} \\ 0 \end{array}$$

HCF of 1197 and 1311 are 57

HCF of 57 and 627

$$\begin{array}{r} 57 \overline{)627} \quad (111 \\ \underline{-57} \\ 57 \\ \underline{-57} \\ 0 \end{array}$$

HCF of 1197, 1311 and 627 = 57

6. Find the LCM of the denominators of the following fractions:

(a)  $\frac{7}{8}, \frac{9}{11}$

Ans. LCM of denominators = 8, 11

8	8, 11
11	1, 11
	1, 1

LCM of denominators =  $8 \times 11 = 88$

(b)  $\frac{4}{65}, \frac{13}{91}, \frac{1}{117}$

LCM of denominators, 65, 91 and 117

3	65, 91, 117
3	65, 91, 39
7	65, 91, 13
5	65, 13, 13
13	13, 13, 13
	1, 1, 1

LCM of denominators =  $3 \times 3 \times 7 \times 5 \times 13 = 4095$

(c)  $\frac{1}{24}, \frac{3}{23}, \frac{5}{48}$

LCM of denominators = 24, 23 and 48

2	24, 23, 48
2	12, 23, 24
2	6, 23, 12
2	3, 23, 6
23	3, 23, 3
23	1, 23, 1
	1, 1, 1

LCM of 24, 23 and 48 =  $2 \times 2 \times 2 \times 2 \times 3 \times 23 = 1104$

(d)  $\frac{23}{91}, \frac{1}{1547}$

LCM of denominators = 91 and 1547

7	91, 1547
13	13, 221
17	17, 17
	1, 1

LCM of denominators  $7 \times 13 \times 17 = 1547$

7. Reduce these fractions to the lowest terms by cancelling the HCF of the numerator and the denominator :

**Ans.** (a) In  $\frac{696}{2048}$ ; numerator = 696 and denominator = 2048

HCF of numerator and denominator = 696 and 2048.

$$\begin{array}{r}
 696 \overline{)2048} \quad (2 \\
 \underline{1392} \\
 656 \overline{)696} \quad (1 \\
 \underline{-656} \\
 40 \overline{)656} \quad (16 \\
 \underline{640} \\
 16 \overline{)40} \quad (2 \\
 \underline{-32} \\
 8 \overline{)16} \quad (2 \\
 \underline{-16} \\
 0
 \end{array}$$

HCF of 696 and 2048 is 8.

Lowest term of  $\frac{696}{2048}$  is  $\frac{696 \div 8}{2048 \div 8} = \frac{87}{256}$

(b) In  $\frac{248}{341}$ ; numerator = 248 and denominator = 341

HCF of numerator and denominator = 248 and 341

$$\begin{array}{r} 248 \overline{)341} ( 1 \\ \underline{-248} \\ 93 \overline{)248} ( 2 \\ \underline{-186} \\ 62 \overline{)93} ( 1 \\ \underline{-62} \\ 31 \overline{)62} ( 2 \\ \underline{62} \\ 0 \end{array}$$

HCF of 248 and 341 is 31

Lowest term of  $\frac{248}{341}$  is  $\frac{248 \div 31}{341 \div 31} = \frac{8}{11}$

(c) In  $\frac{1250}{6250}$ ; numerator = 1250 and denominator = 6250

HCF of numerator and denominator = 1250 and 6250

$$\begin{array}{r} 1250 \overline{)6250} ( 5 \\ \underline{-6250} \\ 0 \end{array}$$

$\therefore$  HCF of 1250 and 6250 is 1250

Lowest term of  $\frac{1250}{6250} = \frac{1250 \div 1250}{6250 \div 1250} = \frac{1}{5}$

(d) In  $\frac{468}{1080}$ ; numerator = 468 and denominator = 1080

HCF of numerator and denominator = 468 and 1080

$$\begin{array}{r} 468 \overline{)1080} ( 2 \\ \underline{-936} \\ 144 \overline{)468} ( 3 \\ \underline{-432} \\ 36 \overline{)144} ( 4 \\ \underline{-144} \\ 0 \end{array}$$

HCF of 468 and 1080 is 36

Lowest term of  $\frac{468}{1080} = \frac{468 \div 36}{1080 \div 36} = \frac{13}{30}$

**8.** Find the largest number that divides 2011 and 2623 leaving remainders 9 and 5 respectively.

**Ans.** We when 2011 is divided by the number remainder of 9 is left.

Thus  $2011 - 9 = 2002$  is divisible number.

When 2623 is divided by the number remainder 5 is left.

Thus  $2623 - 5 = 2618$  is divisible number.

HCF of 2002 and 2618

$$\begin{array}{r}
 2002 \overline{)2618} \quad (1 \\
 \underline{-2002} \\
 616 \overline{)2002} \quad (3 \\
 \underline{-1848} \\
 154 \overline{)616} \quad (4 \\
 \underline{-616} \\
 0
 \end{array}$$

9. Find the largest number that divides 445, 572 and 699 leaving remainders 4, 5 and 6 respectively.

**Ans.** When 445 is divided by the number remainder 4 is left.

Thus,  $445 - 4 = 441$  is divisible number.

When 572 is divided by the number remainder 5 is left.

Thus,  $572 - 5 = 567$  is divisible number.

When 699 is divided by the number remainder 6 is left.

Thus,  $699 - 6 = 693$  is divisible number.

So for calculation required number finding HCF of 441, 567 and 693

HCF of 567 and 693

$$\begin{array}{r}
 567 \overline{)693} \quad (1 \\
 \underline{-567} \\
 126 \overline{)567} \quad (4 \\
 \underline{-504} \\
 63 \overline{)126} \quad (2 \\
 \underline{-126} \\
 0
 \end{array}$$

HCF of 441 and 63

$$\begin{array}{r}
 63 \overline{)441} \quad (7 \\
 \underline{441} \\
 0
 \end{array}$$

HCF of 567, 693 and 44 is 63

Thus, required number is 63.

10. A rectangular wall of size 11 m 20 cm and 9 m 60 cm is paved with square marble stones of the same size. Find the least number of marble stones required.

**Ans.** Length of rectangular wall 11 m 20 cm

(1 m = 100 cm)

=  $(11 \times 100 + 20)$  cm

= 1120 cm

Length of rectangular wall = 9 m 60 cm (1 m = 100 cm)

=  $(9 \times 100 + 60)$  cm

= 960 cm

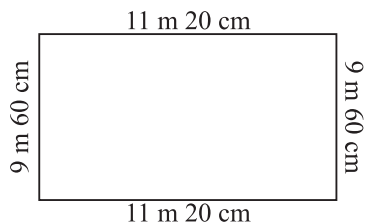
Side of one stone = 160

Least number of stones =  $\frac{1120 \times 960}{160 \times 160} = 42$

Hence the least number of marble stones required 42

HCF of 1120 and 960

$$\begin{array}{r}
 960 \overline{)1120} \quad (1 \\
 \underline{-960} \\
 160 \overline{)960} \quad (6 \\
 \underline{960} \\
 0
 \end{array}$$



11. Find the smallest number which when divided by 18 and 37 leaves remainder 3 in each case.

Ans. Find the LCM of the divisor = 18 and 37

18	18, 37
37	1, 37
	1 1

LCM of 18 and 37 =  $18 \times 37 = 666$

Required number =  $666 + 3 = 669$

12. Three bells toll at intervals of 16, 24 and 32 seconds. If they begin to toll together, after how much time will they toll together again?

Ans. Bells toll together find the LCM of 16, 24 and 32

2	16, 24, 32
2	8, 12, 16
2	4, 6, 8
2	2, 3, 4
2	1, 3, 2
3	1, 3, 1
	1, 1, 1

LCM of 16, 24 and 32 =  $2 \times 2 \times 2 \times 2 \times 2 \times 3 = 96$

They toll together after 96 sec.

13. A, B and C start running on a circular track from their respective points. A completes a full circle in 110 seconds, B in 130 seconds and C in 150 seconds. If they all start from the same point, when will they all next be at the starting point considering that they all run at the same speed?

Ans. 'A' completes a full circle = 110 sec

'B' completes a full circle = 130 sec

'C' completes a full circle = 150 sec

The time when they all consider same time

LCM 110 sec, 130 sec, 150 sec

2	110, 130, 150
3	55, 65, 75
5	55, 65, 25
5	11, 13, 5
11	11, 13
13	1, 13, 1
	1, 1, 1

LCM of 110, 130 and 150 =  $2 \times 3 \times 5 \times 5 \times 11 \times 13 = 21450$  sec

they will together after 21450 sec is starting point.



**14.** A dealer has three different qualities of rice filled in containers of 208 kg, 494 kg and 949 kg. If he wants to pack them in exact number of bags, what should be the capacity of a bag?

**Ans.** Size of three container for rice = 208 kg, 494 kg and 949 kg

Finding extant number of bags capacity of bags = HCF of rice contains

HCF of 208 kg, 494 kg and 949 kg

HCF of 949 and 494

$$\begin{array}{r}
 494 \overline{)949} \text{ (1)} \\
 \underline{-494} \\
 455 \overline{)494} \text{ (1)} \\
 \underline{-455} \\
 39 \overline{)455} \text{ (11)} \\
 \underline{-429} \\
 26 \overline{)39} \text{ (1)} \\
 \underline{-26} \\
 13 \overline{)26} \text{ (2)} \\
 \underline{-26} \\
 0
 \end{array}$$

HCF of 208 and 13

$$\begin{array}{r}
 13 \overline{)208} \text{ (16)} \\
 \underline{-13} \\
 78 \\
 \underline{-78} \\
 0
 \end{array}$$

HCF of 949, 494 and 208 = 13

Hence 13 containers we need to fill the rice.

**15.** Three water tankers contain 1470 l, 2688 l and 4032 l of water respectively. Find the maximum capacity of a container which can measure the water of each container in exact number of times.

**Ans.** Water tankers contain water respectively = 1470 l, 2688 l and 4032 l

Finding maximum capacity of container = HCF of 1470 l, 2688 l and 4032 l

HCF of 4032 and 2688

HCF of 1470 and 1344

$$\begin{array}{r}
 2688 \overline{)4032} \text{ (1)} \\
 \underline{-2688} \\
 1344 \overline{)2688} \text{ (2)} \\
 \underline{-2688} \\
 0
 \end{array}$$

$$\begin{array}{r}
 1344 \overline{)1470} \text{ (1)} \\
 \underline{-1344} \\
 126 \overline{)1344} \text{ (10)} \\
 \underline{-1260} \\
 84 \overline{)126} \text{ (1)} \\
 \underline{-84} \\
 42 \overline{)84} \text{ (2)} \\
 \underline{-84} \\
 0
 \end{array}$$

HCF of 4032 and 2688 = 1344

HCF of 1470, 2688 and 4032 = 42

Hence maximum capacity of water tanker = 42 l

**16.** A heap of shots when made up into groups of 28, 32 and 42 leaves always a remainder 5. Find the least number of shots such a heap can contain.

**Ans.** A heap of sheets made of group = 28, 32 and 42

First, we find LCM of 28, 32 and 42

2	28, 32, 42
2	14, 16, 21
2	7, 8, 21
2	7, 4, 21
2	7, 2, 21
3	7, 1, 21
7	7, 1, 7
	1, 1, 1

LCM of 28, 32 and 42 =  $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 7 = 572$

Always remainder = 5

Then, the least number of shots  $672 + 5 = 677$ .

17. In a morning walk, three persons step off together. Their steps measure 80 cm, 85 cm and 90 cm respectively. What is the minimum distance each should walk so that all can cover the same distance in complete steps? Properties of HCF and LCM

**Ans.** Three person covered the distance = 80 cm, 85 cm and 90 cm

Minimum distance covered in same distance and same complete steps together.

LCM of 80, 85, 90

2	80, 85, 90
2	40, 85, 45
2	20, 85, 45
2	10, 85, 45
3	5, 85, 45
3	5, 85, 15
5	5, 85, 5
17	1, 17, 1
	1, 1, 1

LCM of 80, 85 and 90 =  $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 17 = 12240$

Hence, Minimum distance covered in same distance = 12240 cm.

### Exercise-3.5

1. The product of two numbers is 4800. If their HCF is 24, find their LCM.

**Ans.** Here, product the two numbers = 4800

HCF of the numbers = 24

$$\therefore \text{HCF of the numbers} = \frac{\text{Product of the numbers}}{\text{LCM of the numebrs}}$$

$$\frac{4800}{24} = 200$$

Thus, HCF of the numbers = 200

2. The HCF and LCM of two numbers are 17 and 1666 respectively. If one of the numbers is 119, find the other.

**Ans.** HCF of two numbers = 17  
 LCM of two numbers = 1666  
 One number = 119  
 $\therefore$  One number  $\times$  other numbers = LCM  $\times$  HCF  
 $119 \times \text{other number} = 1666 \times 17$   
 Other number =  $\frac{1666 \times 17}{119} = 238$

Hence, the other number is 238

3. The product of two numbers is 1564 and their LCM is 782. Find their HCF.

**Ans.** Product of two numbers = 1564  
 LCM of two numbers = 782  
 HCF of the numbers =  $\frac{\text{Product the numbers}}{\text{LCM of the number}} = \frac{1564}{782} = 2$

Thus, HCF of the number = 2

4. Find the HCF and LCM of the numbers 3, 4 and 5. Also find the product of the HCF and LCM. Check whether the product of HCF and LCM is equal to the product of the three numbers.

**Ans.** HCF of 3, 4, 5 = 1

3	3, 4, 5
4	1, 4, 5
5	1, 1, 5
	1, 1, 1

LCM of 3, 4 and 5 =  $3 \times 4 \times 5 = 60$

Product of HCF and LCM =  $1 \times 60 = 60$

Product of three product =  $3 \times 4 \times 5 = 60$

Thus, we say that yes, product of HCF and LCM is equal to product of three product.

5. The HCF of two numbers is 17. Can their LCM be 999? Why?

**Ans.** The HCF of two numbers is 17.

17 is prime number

No, 999 is not LCM of their because 17 is not a factor of 999.

6. Find the HCF and LCM of the numbers 1111 and 2222.

**Ans.** HCF of 1111 and 2222

$$\begin{array}{r} 1111 \overline{)2222} \quad (2 \\ -2222 \\ \hline 0 \end{array}$$

HCF of 1111 and 2222 = 1111

LCM of 1111 and 2222

1111	1111, 2222
2	1, 2
	1, 1

LCM of 1111 and 2222 =  $1111 \times 2 = 2222$

7. The HCF and LCM of two numbers are 29 and 1160 respectively. If one of the numbers is 290, find the other number.

**Ans.** HCF of two numbers = 29  
LCM of two numbers = 1160

One of the number is 290

One number  $\times$  other number = LCM  $\times$  HCF

$$290 \times \text{other number} = 29 \times 1160$$

$$\text{Other number} = \frac{29 \times 1160}{290} = 116$$

Other number = 116.

## Exercise-3.6

**Simplify the following :**

1.  $49 \div \{81 - (37 \times 2)\}$

**Ans.**  $49 \div \{81 - (37 \times 2)\}$   
 $= 49 \div \{81 - 74\} = 49 \div 7 = 7$

2.  $80 + \{48 - (4 \times 3)\} \div 3$

**Ans.**  $80 + \{48 - (4 \times 3)\} \div 3$   
 $= 80 + \{48 - 12\} \div 3$   
 $= 80 + 36 \div 3$   
 $= 80 + 12 = 92$

3.  $25 + [12 - \{8 + 3 - (9 \text{ of } 6 - 13 \times 4 + 1)\}]$

**Ans.**  $25 + [12 - \{8 + 3 - (9 \text{ of } 6 - 13 \times 4 + 1)\}]$   
 $= 25 + [12 - \{8 + 3 - (54 - 52 + 1)\}]$   
 $= 25 + [12 - \{8 + 3 - (55 - 52)\}]$   
 $= 25 + [12 - \{11 - 3\}] = 25 + [12 - 8]$   
 $= 25 + 4 = 29$

4.  $75 - \{6 + 4 - (4 + 2 - 3 + 5)\}$

**Ans.**  $75 - \{6 + 4 - (4 + 2 - 3 + 5)\}$   
 $= 75 - \{6 + 4 - (6 - 8)\}$   
 $= 75 - \{6 + 4 - (-2)\} = 75 - \{6 + 4 + 2\}$   
 $= 75 - 12 = 63$

5.  $37 + 26 \div 2 + 2 \text{ of } 14 - 80 \div 2$

**Ans.**  $37 + 26 \div 2 + 2 \times 14 - 80 \div 2$   
 $= 37 + 13 + 2 \times 14 - 40$

$$= 37 + 13 + 28 - 40$$

$$= 78 - 40 = 38$$

6.  $200 [30 - \{15 - (3 \text{ of } 4)\}]$

Ans.  $200 [30 - \{15 - (3 \text{ of } 4)\}]$   
 $= 200 [30 - \{15 - (3 \times 4)\}]$   
 $= 200 [30 - \{15 - 12\}] = 200 [30 - 3]$   
 $= 200 \times 27 = 5400$

7.  $[7835 + \{752 + (825 + 115 - 415 \div 5)\}]$

Ans.  $[7835 + \{752 + (825 + 115 - 415 \div 5)\}]$   
 $= [7835 + \{752 + (825 + 115 - 83)\}]$   
 $= [7835 + \{752 + (940 - 83)\}] = [7835 + \{752 + 857\}]$   
 $= 7835 + 1609 = 9444$

8.  $2225 + [721 - \{922 + 152 - (81 \text{ of } 17 - 21 \times 17 + 1)\}]$

Ans.  $2225 + [721 - \{922 + 152 - (81 \text{ of } 17 - 21 \times 17 + 1)\}]$   
 $= 2225 + [721 - \{922 + 152 - (81 \times 17 - 21 \times 17 + 1)\}]$   
 $= 2225 + [721 - \{922 + 152 - (1377 - 357 + 1)\}]$   
 $= 2225 + [721 - \{922 + 152 - (1378 - 357)\}]$   
 $= 2225 + [721 - \{922 + 152 - 1021\}]$   
 $= 2225 + [721 - \{1072 - 1021\}]$   
 $= 2225 + [721 - 53]$   
 $= 2225 + 668 = 2893$

### I. MCQs : choose the correct option :

1. (b)   2. (a)   3. (c)   4. (b)   5. (b)   6. (b)   7. (d)   8. (b)   9. (b)   10. (b)

### II. Fill in the blanks:

- Ans. 1. A natural number greater than 1, which has no factor other than 1 and itself is called a **prime** number.  
 2. Write all prime numbers between 20 and 30, **23, 29**.  
 3. The product of HCF and LCM of two numbers is equal to the **product of then number**.  
 4. The HCF of two co-prime number is **1**.

### III. State True (T)/False (F):

1. F      2. F      3. T

### HOTS

- Smallest number : Let digit 'p'  

$$5 \ p \ 7 \ 2 \ 9$$
 Sum of digit =  $5 + p + 7 + 2 + 9 = 23$   
 Next number nearest to 23 which is divisible by 3 is 24  

$$24 - 23 = 1$$
 Hence, the number which is divisible by 3 is = 51729
- Largest number  

$$23 < 27 < 30$$
 Largest number  $30 - 23 = 7$   
 So, largest divisible number 57729



# Integers

# 4



## Exercise-4.1

1. Find whether the following statements are true or false. If the statement is false, correct it.

- Ans.** (a) False,  $-1$  is the greatest negative integer  
 (b) True  
 (c) True  
 (d) False, zero is neither positive nor negative  
 (e) True

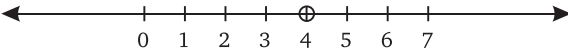
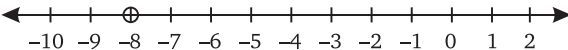
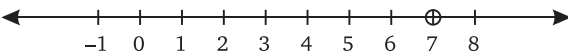
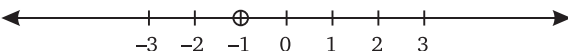
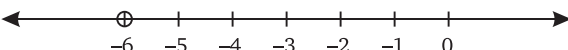
2. Write the opposite of the following situation :

- Ans.** (a) 20 km west of India Gate (b) Profit of ₹ 100  
 (c) Decrease in 9 kg weight (d) 300 m above sea level  
 (e) Withdraw of ₹ 300 (f) Early by 20 minutes

3. Arrange the following integers as follows :

- Ans.** (a) Ascending order  
 (i)  $-10 < -9 < -7 < -5 < 0 < 3 < 5$  (ii)  $-84 < -48 < -45 < -33 < -30$   
 (b) Descending order  
 (i)  $0 > -37 > -68 > -73 > -86$  (ii)  $-157 > -175 > -517 > -715$

4. Represent the following integers on a number line.

- Ans.** (a) 
- (b) 
- (c) 
- (d) 
- (e) 

5. Write the integers lying between :

- Ans.** (a) Integer between  $-4$  and  $2$ ,  $\Rightarrow -3, -2, -1, 0, 1$   
 (b) Integer between  $-3$  and  $3$   $\Rightarrow -2, -1, 0, 1, 2$   
 (c) Integer between  $-711$  and  $-715$   $\Rightarrow -714, -713, -712$

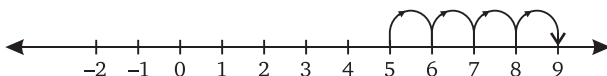
6. Write three negative integers :

- Ans.** (a) Three negative integers greater than  $-22 = -21, -20, -19$   
 (b) Three negative integers greater than  $-96 = -95, -94, -93$   
 (c) Three negative integers less than  $-32$  are  $-33, -34, -35$

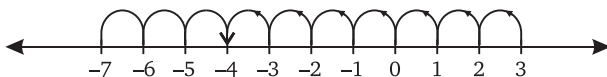


7. Using the number line, write the integer which is :

Ans. (a)  $5 + 4 = 9$



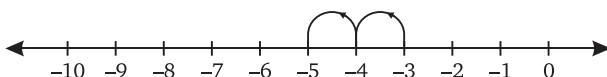
(b)  $3 + (-7) = 3 - 7 = -4$



(c)  $2 - 8 = -6$



(d)  $-3 - 2 = -5$



8. Which is the greatest negative integer? Can you also find the greatest positive integer?

Ans. 1 is greatest negative integer. No, you cannot find the greatest positive integer.

9. Write the next three integers in each of the following patterns :

Ans. (a)  $-40, -35, -30, -25, -20, -15$   
 $\begin{array}{cccccc} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \hline (-40+5) & (-35+5) & (-30+5) & (-25+5) & (-20+5) & \end{array}$

(b)  $-66, -60, -54, -48, -42, -36$   
 $\begin{array}{cccccc} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \hline (-66+6) & (-60+6) & (-54+6) & (-48+6) & (-42+6) & \end{array}$

(c)  $-21, -18, -15, -12, -9, -6$   
 $\begin{array}{cccccc} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \hline (-21+3) & (-18+3) & (-15+3) & (-12+3) & (-9+3) & \end{array}$

(d)  $-84, -72, -60, -48, -36, -24$   
 $\begin{array}{cccccc} \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \hline (-84+12) & (-72+12) & (-60+12) & (-48+12) & (-36+12) & \end{array}$

## Exercise-4.2

1. Add the following :

Ans. (a)  $(-138) + (-122)$   
 $= -138 - 122$   
 $= -260$

(b)  $(-269) + 169$   
 $= -269 + 169$   
 $= -100$

(c)  $(-965) + 400$   
 $= -965 + 400 = -565$

(d)  $(-139) + (-456)$   
 $= -139 - 456 = -595$

(e)  $(-278) + 278$   
 $= -278 + 278 = 0$

(f)  $(-3) + 5 + (-2)$   
 $= -3 + 5 - 2 = 0$

2. Write the successor :

Ans. (a) Successor of  $-391 = -391 + 1 = -390$

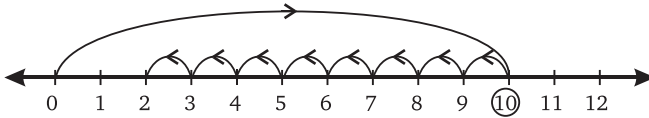
(b) Successor of  $-1079 = -1079 + 1 = -1078$

(c) Successor of 1 lakh (100000) =  $100000 + 1 = 100001$

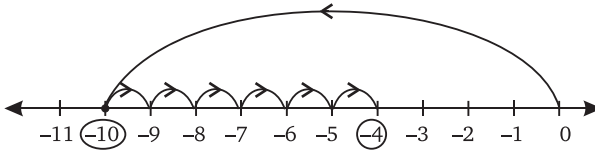
(d) Successor of 9 thousands or 9000 =  $9000 + 1 = 9001$

3. Draw a number line and show the following additions on it :

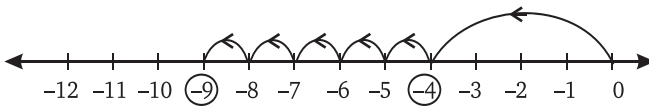
Ans. (a)  $10 + (-8) = 10 - 8 = 2$



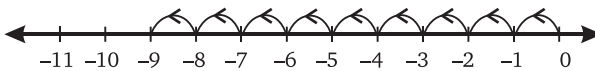
(b)  $(-10) + 6 = -10 + 6 = -4$



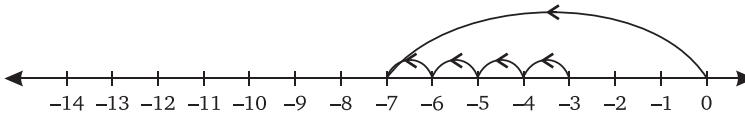
(c)  $(-4) + (-5) = -4 + (-5) = -4 - 5 = -9$



(d)  $0 + (-9) = -9$



(e)  $(-6) + (-1) + 4 = -6 - 1 + 4 = -7 + 4 = -3$



4. Find the value of the following :

Ans. (a)  $(-63) + (-93) + (-123) + (-243)$   
 $= -63 - 93 - 123 - 243$   
 $= -522$

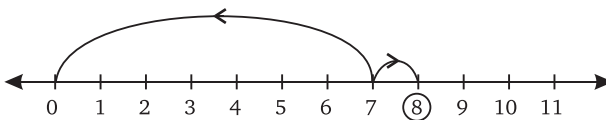
(b)  $687 + 0 + (-79) + (-548) + (-223)$   
 $= 687 + (-79) + (-548) + (-223)$   
 $= 687 - 79 - 548 - 223$   
 $= 687 - 850 = -163$

(c)  $(-156) + 165 + (-134) + (-123) + 134$   
 $= 165 + 134 + (-156) + (-134) + (-123)$   
 $= 299 - 156 - 134 - 123$   
 $= 299 - 413 = -114$

(d)  $(-230) + (-457) + (-393) + 205$   
 $= -230 - 457 - 393 + 205$   
 $= -1080 + 205$   
 $= -875$

5. Using a number line, write the integer which is :

Ans. (a) 7 more than 1  $\Rightarrow 7 + 1 = 8$

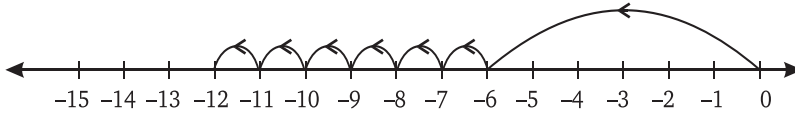


(b) 4 more than -4  $\Rightarrow 4 + 4 = 0$

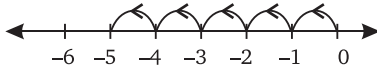




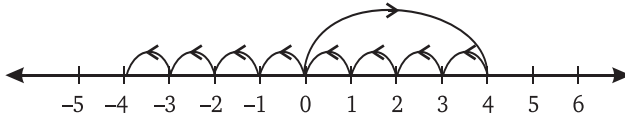
(c) 6 less than  $-6 \Rightarrow -6 - 6 = -12$



(d) 5 less than  $0 \Rightarrow 0 - 5 = -5$



(e) 8 less than  $4 \Rightarrow 4 - 8 = -4$



(f) 4 more than  $-2 \Rightarrow -2 + 4 = -2$



6. In Leh, the temperature was  $6^{\circ}\text{C}$  in the morning. It dropped by 9 degrees at night. Find the temperature of Leh at night.

**Ans.** Temperature in the morning  $6^{\circ}\text{C}$

Temperature dropped by  $9^{\circ}\text{C}$  at night

The temperature of Leh at night  $6^{\circ}\text{C} - 9^{\circ}\text{C} = -3^{\circ}\text{C}$

### Exercise-4.3

1. Find the predecessor of the following :

(a) Predecessor of  $-301 = -301 - 1 = -302$

(b) Predecessor of  $9001 = 9001 - 1 = 9000$

(c) Predecessor of  $-6991 = -6991 - 1 = -6992$

2. Find the value of  $x$  in the following :

(a)  $34 - x = 10$

$-x = 10 - 34$

$-x = -24$

$x = 24$

(c)  $-7 + x = 0$

$x = 0 + 7 = +7$

$x = +7$

(e)  $-4 + x = -12$

$x = -12 + 4$

$x = -8$

(b)  $x + 8 = -19$

$x = -19 - 8$

$= -27$

$x = -27$

(d)  $841 + x = 512$

$x = 512 - 841$

$x = -329$

(f)  $-5 + x = -5$

$x = -5 + 5$

$x = 0$

3. Subtract the following :

(a) Subtract  $-625$  from  $275$   
 $= 275 - (-625)$   
 $= 275 + 625$   
 $= 900$

(c) Subtract  $900$  from  $830$   
 $= 830 - 900$   
 $= -70$

(e) Subtract  $151$  from  $(-251)$   
 $= -251 - 151$   
 $= -402$

(b) Subtract  $219$  from  $369$   
 $= 369 - 219$   
 $= 150$

(d) Subtract  $(-18)$  from  $(-10)$   
 $= (-10) - (-18)$   
 $= -10 + 18 = +8$

(f) Subtract  $(-50)$  from  $(-46)$   
 $= -46 - (-50)$   
 $= -46 + 50 = 4$

4. Simplify :

(a)  $-15 + 34 - 14 - 6$   
 $= +34 - 14 - 6 - 15$   
 $= -1$

(c)  $-55 - (-19) - 21 + 25$   
 $= -55 + 19 - 21 + 25$   
 $= -55 - 21 + 19 + 25$   
 $= -76 + 19 + 25$   
 $= -76 + 44 = -32$

(e)  $-46 + (-13) + (-32)$   
 $= -46 - 13 - 32$   
 $= -91$

(g)  $28 - (-26) - 3 - (-7) + 9$   
 $= 28 + 26 - 3 + 7 + 9$   
 $= 70 - 3$   
 $= 67$

(b)  $-8 + (-9) + (-80)$   
 $= -8 - 9 - 80$   
 $= -97$

(d)  $100 - (-100) - (-100)$   
 $= 100 + 100 + 100$   
 $= 300$

(f)  $-13 + (-17) - (-22) - (-40)$   
 $= -13 - 17 + 22 + 40$   
 $= -30 + 62 = 32$

(h)  $70 + (-99) + 47 - (-28) - 46$   
 $= 70 - 99 + 47 + 28 - 46$   
 $= 70 + 47 + 28 - 99 - 46$   
 $= 145 - 145 = 0$

5. A submarine was situated  $700$  m below the sea level. If it ascends  $250$  m, what is its new position?

**Ans.** Original position of submarine  $= -700$  m

Ascend position of submarine  $= 250$  m

New position of submarine  $= -750$  m  $+ 250$  m  $= -450$  m

6. In Shimla, the temperature was  $2^{\circ}\text{C}$  one afternoon. If the temperature dropped by  $5^{\circ}\text{C}$  at night, find the temperature of Shimla at night.

**Ans.** Temperature at after noon  $= 2^{\circ}\text{C}$

Drop in temperature at night  $= 5^{\circ}\text{C}$

Temperature at night  $= 2^{\circ}\text{C} - 5^{\circ}\text{C} = -3^{\circ}\text{C}$

7. In a quiz, positive marks are given for correct answers and negative marks given for incorrect answers. If Reeta's scores in four successive rounds were  $35, -5, -10, 20$  what was her total score at the end?

**Ans.** Scores of Reeta in four successive round  $= 35, -5, -10, 20$

Correct answer  $= 35 + 20 = 55$

Total scored  $= 55 - 15 = 40$

8. The sum of two integers is  $12$ . If one integer is  $(-48)$ . Find the other. Check your answer.

**Ans.** Sum of two integer  $= 12$

One integer  $= -48$

Let's second integer be  $x$

now  $x + (-48) = 12 \Rightarrow x - 48 = 12 \Rightarrow x = 12 + 48 \Rightarrow x = 60$

so second integer  $= 60$

Check :  $60 - 48 = 12$

### I. MCQs : Choose the correct option :

1. (b)    2. (b)    3. (c)    4. (c)    5. (c)    6. (a)    7. (c)    8. (b)

### II. Fill in the blanks :

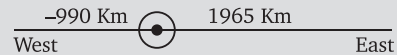
- The sum of an integer and its additive inverse is always **zero**.
- The difference between the successor and predecessor of any integer is **2**.
- An integer which is neither positive nor negative is **zero**.
- Every positive integer is **greater** than every negative integer.
- Absolute value of an integer is its **numerical value** to the given integer.

### III. State True (T)/False (F) :

1. T    2. F    3. T    4. T    5. F

### Mental Maths

- Plane flies in west of Tokyo = 990 km  
Plane flies in east of Tokyo = 1965 km  
Now, Plane from Tokyo =  $(1965 - 990)$  km  
= 975 km



The plane is 975 east of Tokyo

- Won the first game = ₹ 500 or 500      Lost the second game = ₹ 700 or - 700  
Lost the third game = ₹ 1000 or - 1000      Won four game = ₹ 1500 or + 1500  
Lost last game = ₹ 1600 or - 1600  
Total over all gain on loss =  $500 - 700 - 1000 + 1500 - 1600 = -1300$   
Thus her overall loss ₹ 1300.
- If we added a positive and a negative integer.  
Then, we get negative integer.
- The absolute value of an integer is its numerical value regardless of its sign Absolute value of an integer  $a$  is denoted by  $|a|$ .

$$|-5 + 4| \text{ or } |-5| + |4|$$

$$|-5 + 4| = |-1| = 1$$

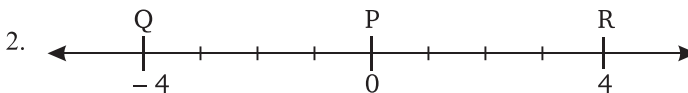
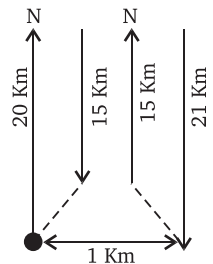
$$|-5| + |4| = 5 + 4 = 9$$

$$1 < 9$$

$$|-5 + 4| < |-5| + |4|$$

### HOTS

- Distance over to ward north = 20 km (going up)  
Distance cover toward south = 15 km (going down)  
Distance cover toward north = 15 km (going up)  
Distance cover toward south = 21 km (going down).  
To final position =  $20 - 15 - 15 + 21 = 1$



Since  $P$  is the successor of  $-1$

*i.e.*,  $P = -1 + 1 = 0$

Now, we can conclude the value of  $Q$  and  $R$

Since  $Q$  is the 4 step left words to  $P$

So,  $Q = 0 - 4 = -4$

Similarly  $R$  is  $S$  to  $P$  right side to the  $P$

So,  $R = 0 + 4 = 4$

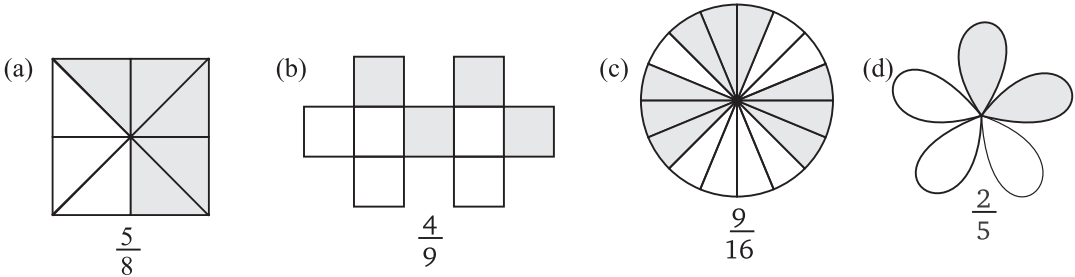


# Fractions







# 5

## Exercise-5.1

1. Shade the figure according to the given fraction :



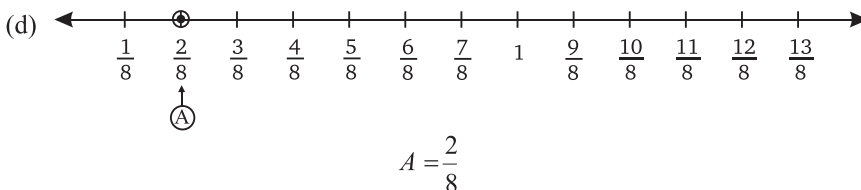
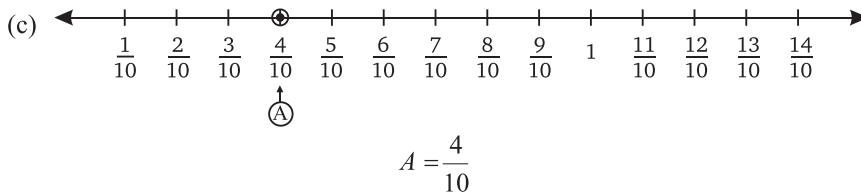
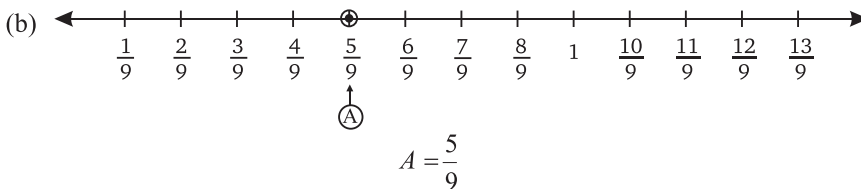
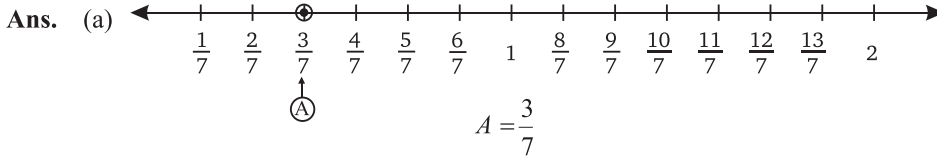
2. Complete the table given below. Shade the boxes according to the fraction formed :

	Shaded Parts	Fraction	Fractional Number
(a)	3 out of 5 parts	$\frac{3}{5}$	three-fifths 
(b)	2 out of 6 parts	$\frac{2}{6}$	Two-sixths 
(c)	5 out of 7 parts	$\frac{5}{7}$	Five-seventh 
(d)	6 out of 9 parts	$\frac{6}{9}$	Six-ninths 
(e)	8 out of 10 parts	$\frac{8}{10}$	Eight-tenths 
(f)	4 out of 8 parts	$\frac{4}{8}$	Four-eighths 

3. Find what fraction of

- Ans. (a) Fraction of a day is 6 hours =  $\frac{6}{24}$  or  $\frac{1}{4}$  (1 day = 24 hours)
- (b) Fraction of hours is 15 minutes =  $\frac{15}{60}$  or  $\frac{1}{4}$  (1 hrs = 60 mins)
- (c) Fraction of a year is 1 months =  $\frac{1}{12}$  (1 year = 12 months)
- (d) Fraction of a week is 3 days =  $\frac{3}{7}$  (1 week = 7 day)

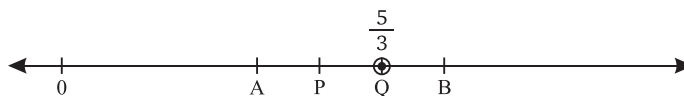
4. Draw number line and show the following fractions on it :



5. Draw number lines and show the following fractions on it :

Ans. (a)  $\frac{5}{3} = 1\frac{2}{3}$

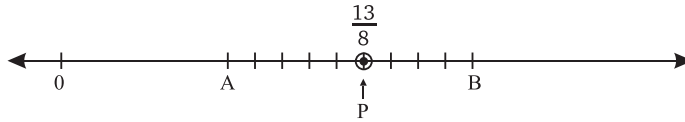
So,  $\frac{2}{3}$  will lie between 1 and 2. Since 3 is the denominator, we will divide the distance between 1 and 2 into 3 equal part. Points  $PQ$  do this.



The point  $Q$  represent  $1\frac{2}{3}$  or  $\frac{5}{3}$ .

(b)  $\frac{13}{8} = 1\frac{5}{8}$

So,  $\frac{13}{8}$  will lie between 1 and 2. Since 8 is denominator, we will divide the distance between 1 and 2 into 8 equal parts.

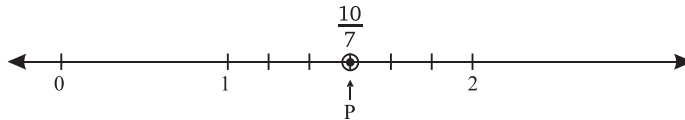


The point  $P$  represent  $1\frac{5}{8}$  or  $\frac{13}{8}$

(c)  $\frac{10}{7} = 1\frac{3}{7}$

So,  $\frac{10}{7}$  will lie between 1 and 2.

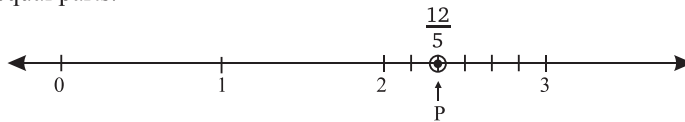
Since 7 is denominator, we will divide the distance between 1 and 2 into 7 equal parts.



The point  $P$  represent  $1\frac{3}{7}$  or  $\frac{10}{7}$ .

(d)  $\frac{12}{5} = 2\frac{2}{5}$

So,  $\frac{12}{5}$  will lie between 2 and 3. Since 5 is denominator, we will divide the distance between 2 and 3 into 5 equal parts.



The point  $P$  represent  $2\frac{2}{5}$  or  $\frac{12}{5}$ .

6. Find how many :

Ans. (a) Three make  $\frac{1}{3}$  as one whole

(b) Six make  $\frac{1}{6}$  as one whole.

7. In a box of 60 mangoes, 12 mangoes were rotten. What fraction of the mangoes is :

Ans. Number of total mangoes = 60

Rotten mangoes = 12

Then, fresh mangoes =  $60 - 12 = 48$

(a) Fraction of fresh mangoes =  $\frac{48}{60}$  or  $\frac{4}{5}$

(b) Fraction of rotten mangoes =  $\frac{12}{60} = \frac{1}{5}$

8. Nidhi has 10 chocolates. She gives half of them to Sarika. How many chocolates does she give to Sarika?

**Ans.** Nidhi have chocolates = 10

$$\text{Nidhi gives half chocolates} = \frac{1}{2}$$

$$\text{Number of chocolates her give} = 10 \times \frac{1}{2} = 5$$

9. A bag contains 20 balls, of which 3 balls are green, 10 balls are red and the remaining are blue. What fractions of the balls represent red, blue and green balls?

**Ans.** Total number of balls = 20

Number of green balls = 3

Numbers of red ball = 10

$$\text{Numbers of blue ball} = 20 - 3 - 10 = 7$$

$$\text{Fractions represent of red ball} = \frac{10}{20} = \frac{1}{2}$$

$$\text{Fractions represent of blue ball} = \frac{7}{20}$$

$$\text{Fractions represent of green ball} = \frac{3}{20}$$

10. Sonam had packet of 36 toffees. She gave half of the packet to Peter and the remaining half to Monu.

**Ans.** Sonam had toffees = 36

$$\text{She gave toffee to peter} = 36 \times \frac{1}{2} = 18$$

$$\text{Remaining toffees} = 36 - 18 = 18$$

(a) Peter get toffees = 18

(b) Monu get toffees = 18



## Exercise-5.2

1. Convert the following into mixed fractions :

**Ans.** Mixed Fraction = Quotient  $\frac{\text{Remainder}}{\text{Denominator}}$

(a)  $\frac{200}{65} \Rightarrow$  On dividing 200 by 65 ( $200 \div 65$ )

We get 3 as the quotient and 5 as the remainder.

So,  $\frac{200}{65} = 3 \frac{5}{65}$

(b)  $\frac{1024}{112} \Rightarrow$  On dividing 112 by 1124 ( $1124 \div 112$ )

We get 9 as the quotient and 16 as the remainder

So,  $\frac{1024}{112} = 9 \frac{16}{112}$

(c)  $\frac{2700}{92} \Rightarrow$  On dividing 2700 by 92 ( $2700 \div 92$ )

We get 29 as a quotient and 32 as a remainder

$$\frac{2700}{92} = 29 \frac{32}{92}$$

$$\begin{array}{r} 65 \overline{)200} \quad (3 \rightarrow \text{Quotient} \\ \underline{195} \\ 5 \quad \rightarrow \text{Remainder} \end{array}$$

$$\begin{array}{r} 112 \overline{)1024} \quad (9 \rightarrow \text{Quotient} \\ \underline{-1008} \\ 16 \quad \rightarrow \text{Remainder} \end{array}$$

$$\begin{array}{r} 92 \overline{)2700} \quad (29 \rightarrow \text{Quotient} \\ \underline{-184} \\ 860 \\ \underline{-828} \\ 32 \quad \rightarrow \text{Remainder} \end{array}$$



(d)  $\frac{2375}{175} \Rightarrow$  On dividing 2372 by 175 ( $2372 \div 175$ )

We get 13 as a quotient and 100 as a remainder

$$\frac{2375}{175} = 13 \frac{100}{175}$$

$\begin{array}{r} 175 \overline{)2375} \quad (13 \rightarrow \text{Quotient}) \\ \underline{-175} \phantom{00} \\ 625 \\ \underline{-525} \phantom{00} \\ 100 \phantom{00} \rightarrow \text{Remainder} \end{array}$
--

2. Convert the following into improper fractions :

**Ans.** Improper Fraction =  $\frac{(\text{Whole number} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$

(a)  $38 \frac{2}{15} = \frac{(38 \times 15) + 2}{15}$   
 $= \frac{570 + 2}{15} = \frac{572}{15}$

(b)  $56 \frac{11}{21} = \frac{(56 \times 21) + 11}{21}$   
 $= \frac{1176 + 11}{21} = \frac{1187}{21}$

(c)  $17 \frac{37}{200} = \frac{(17 \times 200) + 37}{200}$   
 $= \frac{3400 + 37}{200} = \frac{3437}{200}$

(d)  $11 \frac{3}{80} = \frac{(11 \times 80) + 3}{80}$   
 $= \frac{880 + 3}{80} = \frac{883}{80}$

3. Write any five equivalent fractions of the following :

**Ans.** (a)  $\frac{6}{7} \Rightarrow$  Five equivalent fractions of  $\frac{6}{7}$  are

$$\frac{6 \times 1}{7 \times 1} = \frac{6}{7}; \quad \frac{6 \times 2}{7 \times 2} = \frac{12}{14}; \quad \frac{6 \times 3}{7 \times 3} = \frac{18}{21}; \quad \frac{6 \times 4}{7 \times 4} = \frac{24}{28}; \quad \frac{6 \times 5}{7 \times 5} = \frac{30}{35}$$

$\frac{6}{7}, \frac{12}{14}, \frac{18}{21}, \frac{24}{28}$  and  $\frac{30}{35}$  are equivalent fractions.

(b)  $\frac{9}{13} \Rightarrow$  Five equivalent fraction of  $\frac{9}{13}$  are

$$\frac{9 \times 1}{13 \times 1} = \frac{9}{13}; \quad \frac{9 \times 2}{13 \times 2} = \frac{18}{26}; \quad \frac{9 \times 3}{13 \times 3} = \frac{27}{39}; \quad \frac{9 \times 4}{13 \times 4} = \frac{36}{52}; \quad \frac{9 \times 5}{13 \times 5} = \frac{45}{65}; \quad \frac{9 \times 6}{13 \times 6} = \frac{54}{78}$$

$\frac{9}{13}, \frac{18}{26}, \frac{27}{39}, \frac{36}{52}, \frac{45}{65}$  and  $\frac{54}{78}$  are equivalent fractions.

(c)  $\frac{3}{5} \Rightarrow$  Five equivalent fractions of  $\frac{3}{5}$  are

$$\frac{3 \times 1}{5 \times 1} = \frac{3}{5}; \quad \frac{3 \times 2}{5 \times 2} = \frac{6}{10}; \quad \frac{3 \times 3}{5 \times 3} = \frac{9}{15}; \quad \frac{3 \times 4}{5 \times 4} = \frac{12}{20}; \quad \frac{3 \times 5}{5 \times 5} = \frac{15}{25}; \quad \frac{3 \times 6}{5 \times 6} = \frac{18}{30}$$

$\frac{3}{5}, \frac{6}{10}, \frac{9}{15}, \frac{12}{20}, \frac{15}{25}$  and  $\frac{18}{30}$  are equivalent fractions.

4. Fill the boxes to make equivalent fractions :

**Ans.** (a)  $\frac{2}{5} = \frac{\boxed{6}}{15}$  ( $2 \times 3$ )

(b)  $\frac{(5 \times 3) \boxed{15}}{(6 \times 3) 18} = \frac{5}{6}$

(c)  $\frac{1}{8} = \frac{\boxed{4}}{32}$  ( $1 \times 4$ )

(d)  $\frac{4}{7} = \frac{\boxed{12}}{21}$  ( $4 \times 3$ )

(e)  $\frac{5}{12} = \frac{\boxed{60}}{144}$  ( $5 \times 12$ )

(f)  $\frac{3}{10} = \frac{\boxed{300}}{\boxed{1000}}$  ( $3 \times 100$ )

5. Reduce the following fractions to their lowest forms :

**Ans.** (a)  $\frac{36}{144}$

The HCF of 36 and 144 is 36  
 Dividing both 36 and 144 by 36

(b)  $\frac{65}{117}$

The HCF of 65 and 117 is 13  
 Dividing both 65 and 117 by 13



$$\frac{36 \div 36}{144 \div 36} = \frac{1}{4}$$

(c)  $\frac{180}{120}$

The HCF of 180 and 120 is 60  
Dividing both 180 and 120 by 60

$$\frac{180 \div 60}{120 \div 60} = \frac{3}{2}$$

(e)  $\frac{19}{57}$

The HCF of 19 and 57 is 19  
Dividing both 19 and 57 by 19

$$\frac{19}{57} = \frac{19 \div 19}{57 \div 19} = \frac{1}{3}$$

$$\frac{65 \div 13}{117 \div 13} = \frac{5}{9}$$

(d)  $\frac{440}{990}$

The HCF of 440 and 990 is 110  
Dividing both 440 and 990 by 110

$$\frac{440 \div 110}{990 \div 110} = \frac{4}{9}$$

(f)  $\frac{69}{207}$

HCF of 69 and 207 is 69  
Dividing both 69 and 207 by 69

$$\frac{69}{207} = \frac{69 \div 69}{207 \div 69} = \frac{1}{3}$$

6. Circle the fractions which are in the simplest form.

**Ans.** (**Note :** We know that to derive the simplest form of a fraction, you have to find a fraction whose numerator and denominator have no common factor except 1.)

(a)  $\frac{27}{36}$ ,  $\frac{4}{9}$ ,  $\frac{8}{26}$ ,  $\frac{22}{24}$

(b)  $\frac{1}{2}$ ,  $\frac{3}{12}$ ,  $\frac{1}{4}$ ,  $\frac{36}{42}$

(c)  $\frac{7}{11}$ ,  $\frac{36}{42}$ ,  $\frac{2}{9}$ ,  $\frac{8}{16}$

7. Find the equivalent fractions of  $\frac{4}{7}$  having :

**Ans.** (a) The given question implies  $\frac{4}{7} = \frac{100}{?}$

You know that  $4 \times 25 = 100$ , so you need multiply both the denominator and the numerator with 25 to get the required equivalent fraction.

$$\frac{4}{7} = \frac{4 \times 25}{7 \times 25} = \frac{100}{175}$$

(b) The given question implies  $\frac{4}{7} = \frac{180}{?}$

You know that  $4 \times 45 = 180$ , So, you need multiply both denominator and the numerator with 45 to get the required equivalent fraction.

$$\frac{4}{7} = \frac{4 \times 45}{7 \times 45} = \frac{180}{315}$$

(c) The given question implies  $\frac{4}{7} = \frac{x}{84}$

You know that  $7 \times 12 = 84$ . This means by multiply the denominator 84 of the given fraction by 12. You get the required fraction. You also need multiple both numerator and denominator.

$$\frac{4}{7} = \frac{4 \times 12}{7 \times 12} = \frac{48}{84}$$

(d) The given question implies  $\frac{4}{7} = \frac{x}{175}$

You know that  $7 \times 25 = 175$ . This means by multiply the denominator of the given fraction by 25. You get the required fraction. You also need multiple both numerator and denominator.

$$\frac{4}{7} = \frac{4 \times 25}{7 \times 25} = \frac{100}{175}$$

8. Find the equivalent fractions of  $\frac{54}{72}$  with :

Ans. (a) Equivalent fractions =  $\frac{54}{72}$

Then given question implies  $\frac{54}{72} = \frac{6}{x}$

You know that;  $54 \div 9 = 6$ . This means by divide the numerator 54 of the given fractions by 9. You get required fractions.

You are need divide both numerator and denominator.

$$\frac{54}{72} = \frac{54 \div 9}{72 \div 9} = \frac{6}{8}$$

(b) The given equation implies =  $\frac{54}{72} = \frac{?}{4}$ .

You know that  $72 \div 18 = 4$ . This means by divide the denominator 72 of the given fraction by 18. You get the required fraction. you also need divide both numerator and denominator.

$$\frac{54 \div 18}{72 \div 18} = \frac{3}{4}$$

9. Check whether the given fractions are equivalent.

Ans. (a) Cross multiplying the given fractions, you get

$$\frac{4}{5} \times \frac{28}{35}$$

$$4 \times 35 = 140; \quad 28 \times 5 = 140$$

This means  $4 \times 35 = 28 \times 5$

So, the given fractions are equivalent.

(b) Cross multiplying the given fractions, you get  $\frac{8}{9} \times \frac{40}{45}$

$$8 \times 45 = 360; \quad 9 \times 40 = 360$$

This means  $8 \times 45 = 9 \times 40$

So, the given fraction are equivalent.

(c) Cross multiplying the given fractions, you get

$$\frac{4}{7} \times \frac{24}{56}$$

$$4 \times 56 = 224; \quad 7 \times 24 = 168$$

This means  $4 \times 56 \neq 7 \times 24$

So, the given fraction are not equivalent.

(d) Cross multiplying the given fractions, you get

$$\frac{7}{13} \times \frac{5}{11}$$

$$7 \times 11 = 77; \quad 13 \times 5 = 65$$

This means  $7 \times 11 \neq 13 \times 5$

So, the given fraction are not equivalent.

10. Who am I ?

(a) Let I am be  $x$ .

The given question implies =  $\frac{4}{5} = \frac{x}{80}$

$$5 \times 16 = 80$$

You know that. This means by multiply the denominator 80 of the given fraction by 16. You get the required fraction. You also need multiple both numerator and denominator.

$$\frac{4}{5} = \frac{4 \times 16}{5 \times 16} = \frac{64}{80}$$

Thus, I am 64.

- (b) The given question implies
- $$\frac{12}{18} = \frac{4}{x}$$

You know that  $12 \div 3 = 4$ , So you need divided both the denominator and the numerator with 3 to get the required equivalent fraction  $\frac{12}{18} = \frac{12 \div 3}{18 \div 3} = \frac{4}{6}$

Thus, I am 6.

11. Are the following fractions equivalent? Why?

Ans. (a) Cross multiplying the given fraction, you get

$$\frac{3}{4} \quad \frac{21}{28}$$

$$28 \times 3 = 84; \quad 4 \times 21 = 84$$

Thus,  $28 \times 3 = 4 \times 21$

$\frac{3}{4}$  and  $\frac{21}{28}$  are equivalent given fraction because product of numerator of the first fraction and the denominator of the second fraction = Numerator of the second fraction and the denominator of the first fraction.

(b) Cross multiplying the given fraction, you get

$$\frac{8}{9} \quad \frac{8}{10}$$

$$8 \times 10 = 80; \quad 8 \times 9 = 72$$

Thus,  $8 \times 10 \neq 8 \times 9$

$\frac{8}{9}$  and  $\frac{8}{10}$  are not equivalent

given fraction is not equivalent because product of numerator of the first fraction and the denominator of second fraction  $\neq$  numerator of the second fraction and the denominator of the first fraction.

(c) Cross multiply  $3\frac{1}{5}$  on  $\frac{16}{5}$  and given fraction  $\frac{32}{10}$ .

$$\frac{16}{5} \quad \frac{32}{10}$$

$$16 \times 10 = 32 \times 5$$

Thus,  $160 = 160$

or  $16 \times 10 = 32 \times 5$

$3\frac{1}{5}$  are  $\frac{32}{10}$  are equivalent fraction because product of numerator of the first fraction and the denominator of the second fraction = Numerator of the second fraction and the denominator of the first fraction.

12. Stuti had 40 toffees, Arunima had 60 toffees and Alisha has 80 toffees. After one week, Stuti was left with 20 toffees, Arunima with 30 and Alisha with 40. What fraction of toffees did each have after a week? Check whether each consumed an equal fraction of their toffees?

Ans. Stuti had toffees = 40

Arunima had toffees = 60

Alisha had toffees = 80

**After a week**

Stuti left toffees = 20

Arunima left toffees = 30

Alisha left toffees = 40

$$\text{Fraction of Stuti's toffees} = \frac{20}{40} = \frac{1}{2}$$

$$\text{Fraction of Arunima's toffees} = \frac{30}{60} = \frac{1}{2}$$

$$\text{Fraction of Alisha's toffees} = \frac{40}{80} = \frac{1}{2}$$

$$\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$$

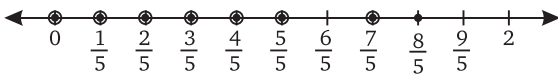
Thus, consumed an equal fraction.



## Exercise-5.3

1. Show  $\frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{5}{5}, \frac{7}{5}$  on the number line. Put appropriate signs  $<$  or  $>$  or  $=$  between the following fractions:

Ans.



(a)  $\frac{4}{5} > \frac{2}{5}$

(b)  $\frac{5}{5} < \frac{7}{5}$

(c)  $\frac{1}{5} < \frac{5}{5}$

(d)  $\frac{3}{5} > \frac{0}{5}$

2. Compare the fractions and put an appropriate sign  $<$ ,  $>$  or  $=$ .

Ans.

(a)  $\frac{4}{7} < \frac{6}{7}$

(b)  $\frac{1}{9} < \frac{1}{4}$

(c)  $\frac{4}{5} > \frac{3}{5}$

(d)  $\frac{8}{25} < \frac{11}{25}$

(e)  $\frac{1}{6} > \frac{1}{7}$

(f)  $\frac{4}{19} < \frac{8}{19}$

(g)  $\frac{16}{11} > \frac{0}{11}$

(h)  $\frac{18}{18} > \frac{17}{18}$

3. Make 10 more pairs as given in question number 2 and put appropriate signs.

Ans.

$\frac{3}{6} < \frac{4}{6}$

$\frac{1}{7} < \frac{1}{3}$

$\frac{2}{5} > \frac{2}{7}$

$\frac{5}{6} > \frac{1}{6}$

$\frac{3}{6} > 0$

$\frac{5}{6} > \frac{3}{6}$

$\frac{3}{4} = \frac{3}{4}$

$\frac{1}{3} > \frac{1}{5}$

$\frac{1}{7} < \frac{2}{7}$

$\frac{5}{6} > \frac{1}{6}$

4. Use cross-multiplication method to compare the following pairs of fractions. Put correct signs ( $<$ ,  $>$  or  $=$ ).

(a)  $\frac{3}{4} \square \frac{7}{8}$

By cross-multiplication

$$\begin{array}{ccc} 3 & \nearrow & 7 \\ 4 & \searrow & 8 \end{array}$$

$3 \times 8 < 7 \times 4$

$24 < 28$

So,  $\frac{3}{4} < \frac{7}{8}$

(b)  $\frac{6}{10} \square \frac{12}{15}$

By cross-multiplication

$$\begin{array}{ccc} 6 & \nearrow & 12 \\ 10 & \searrow & 15 \end{array}$$

$6 \times 15 < 12 \times 10$

$90 < 120$

So,  $\frac{6}{10} < \frac{12}{15}$



(c)  $\frac{1}{3} \square \frac{1}{4}$

By cross-multiplication

$$\frac{1}{3} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{1}{4}$$

$$4 > 3$$

$$4 > 3$$

So,  $\frac{1}{3} > \frac{1}{4}$

(e)  $\frac{1}{4} \square \frac{3}{8}$

By cross-multiplication

$$\frac{1}{4} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{3}{8}$$

$$8 \times 1 < 3 \times 4$$

$$8 < 12$$

$$\frac{1}{4} < \frac{3}{8}$$

(g)  $\frac{7}{10} \square \frac{4}{5}$

By cross-multiplication

$$\frac{7}{10} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{4}{5}$$

$$7 \times 5 < 4 \times 10$$

$$35 < 40$$

$$\frac{7}{10} < \frac{4}{5}$$

(i)  $\frac{9}{16} \square \frac{5}{9}$

By cross-multiplication

$$\frac{9}{16} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{5}{9}$$

$$9 \times 9 > 5 \times 16$$

$$81 > 80$$

$$\frac{9}{16} > \frac{5}{9}$$

(d)  $\frac{5}{7} \square \frac{4}{9}$

By cross-multiplication

$$\frac{5}{7} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{4}{9}$$

$$5 \times 9 > 4 \times 7$$

$$45 > 28$$

So,  $\frac{5}{7} > \frac{4}{9}$

(f)  $\frac{5}{7} \square \frac{15}{21}$

By cross-multiplication

$$\frac{5}{7} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{15}{21}$$

$$21 \times 5 = 15 \times 7$$

$$105 = 105$$

$$\frac{5}{7} = \frac{15}{21}$$

(h)  $\frac{5}{17} \square \frac{6}{16}$

By cross-multiplication

$$\frac{5}{17} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{6}{16}$$

$$5 \times 16 < 6 \times 17$$

$$80 < 102$$

$$\frac{5}{17} < \frac{6}{16}$$

(j)  $\frac{1}{18} \square \frac{8}{36}$

By cross-multiplication

$$\frac{1}{18} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{8}{36}$$

$$1 \times 36 < 8 \times 18$$

$$36 < 144$$

$$\frac{1}{18} < \frac{8}{36}$$

5. The following fractions represent just four different numbers. Separate them into four groups of equal fractions by changing one to its simplest form.

Ans. (a) Simplest form of  $\frac{9}{45} = \frac{9 \div 9}{45 \div 9} = \frac{1}{5}$

(b) Simplest form of  $\frac{12}{16} = \frac{12 \div 4}{16 \div 4} = \frac{3}{4}$

(c) Simplest form of  $\frac{49}{56} = \frac{49 \div 7}{56 \div 7} = \frac{7}{8}$

(d) Simplest form of  $\frac{84}{96} = \frac{84 \div 12}{96 \div 12} = \frac{7}{8}$

(e) Simplest form of  $\frac{75}{100} = \frac{75 \div 25}{100 \div 25} = \frac{3}{4}$

(f) Simplest form of  $\frac{16}{80} = \frac{16 \div 16}{80 \div 16} = \frac{1}{5}$

(g) Simplest form of  $\frac{9}{18} = \frac{9 \div 9}{18 \div 9} = \frac{1}{2}$

(h) Simplest form of  $\frac{102}{136} = \frac{102 \div 34}{136 \div 34} = \frac{3}{4}$

(i) Simplest form of  $\frac{30}{150} = \frac{30 \div 30}{150 \div 30} = \frac{1}{5}$

(k) Simplest form of  $\frac{202}{404} = \frac{202 \div 202}{404 \div 202} = \frac{1}{2}$

(m) Simplest form of  $\frac{45}{60} = \frac{45 \div 15}{60 \div 15} = \frac{3}{4}$

(o) Simplest form of  $\frac{182}{208} = \frac{182 \div 26}{208 \div 26} = \frac{7}{8}$

(j) Simplest form of  $\frac{105}{120} = \frac{105 \div 15}{120 \div 15} = \frac{7}{8}$

(l) Simplest form of  $\frac{25}{125} = \frac{25 \div 25}{125 \div 25} = \frac{1}{5}$

(n) Simplest form of  $\frac{500}{1000} = \frac{500 \div 500}{1000 \div 500} = \frac{1}{2}$

(p) Simplest form of  $\frac{36}{48} = \frac{36 \div 12}{48 \div 12} = \frac{3}{4}$

From the above, we can make four different groups as follows on the bases of lowest term.

$$\frac{1}{5} \rightarrow \frac{9}{45}, \frac{16}{80}, \frac{30}{150}, \frac{25}{125}$$

$$\frac{7}{8} \rightarrow \frac{49}{56}, \frac{84}{96}, \frac{105}{120}, \frac{182}{208}$$

$$\frac{3}{4} \rightarrow \frac{12}{16}, \frac{75}{100}, \frac{102}{136}, \frac{45}{60}, \frac{36}{48}$$

$$\frac{1}{2} \rightarrow \frac{1}{18}, \frac{202}{404}, \frac{500}{1000}$$

6. Parul and Tanu ran a 200 m race. Parul completed the race in  $\frac{2}{3}$  minutes and tanu in  $\frac{4}{8}$  minutes.

Who took more time? Give reason.

**Ans.** Total distance = 200 m

Time taken for covered the race =  $\frac{2}{3}$  min

Time taken for covered =  $\frac{4}{8}$  min

Compassion of  $\frac{2}{3}$  and  $\frac{4}{8}$

$$\begin{array}{r} \frac{2}{3} & & \frac{4}{8} \\ \swarrow & & \searrow \\ 2 \times 8 & > & 3 \times 4 \\ 16 & > & 12 \\ \frac{2}{3} & > & \frac{4}{8} \end{array}$$

Parul take more time for race.

7. Shivi read 50 pages of a book containing 200 pages. Vidushi read  $\frac{1}{5}$  of same book. Who read less?

**Ans.** Total number of pages in book = 200

Shivi read pages of book = 50

Vidushi read page of book =  $200 \times \frac{1}{5} = 40$  page

Comparison =  $50 > 40$

Vidushi read read less pages.

8. Mayank exercised for 50 minutes and Sulabh exercised for  $\frac{3}{4}$  of an hour. Who exercised for a longer time?

**Ans.** Mayank take time for exercised = 50 min

Sulabh take time for exercised =  $\frac{3}{4}$  of an hour

$$\frac{3}{4} \times 60 = 45 \text{ min}$$

Comarision of time = 50 min > 45 min

Mayank exercised for long time.

9. Saurabh finished his homework in  $\frac{8}{16}$  of an hour, while his sister Surabhi finished her homework in  $\frac{3}{4}$  of an hour. Who took less time?

**Ans.** Saurabh finished his homework =  $\frac{8}{16}$  of an hour

$$\frac{8}{16} \times 60 \text{ min} = 30 \text{ min}$$

Surabhi finished his home work  $\frac{3}{4}$  of an hour

$$\frac{3}{4} \times 60 = 45 \text{ min}$$

$$\text{Comparison} = 30 \text{ min} < 45 \text{ min}$$

Thus, Saurabh took less time.

10. Out of 40 students of class VI A, 10 scored more than 90 marks in the Mathematics paper. In class VI B having 36 students, 6 scored more than 90 in the same paper. In which section did more students get over 90 marks in the Mathematics paper?

**Ans.** In class VI number of students = 40

In class VI A Number of students got more than 90 marks = 10

$$\text{Fraction} = \frac{10}{40} \text{ or } \frac{1}{4}$$

In class VI B, number of students = 36

Number of students got more than 90 = 6

$$\text{Fraction} = \frac{6}{36} \text{ or } \frac{1}{6}$$

Comparison of  $\frac{1}{4}$  and  $\frac{1}{6} = \frac{1}{4} < \frac{1}{6}$

So, we say that In class VI B got more than 90 marks.

11. Isha, Preeti and Shinky bought a packet of biscuit each. Their packets contain 8, 12 and 15 biscuits, respectively. Isha ate 4 biscuits from her packet, preeti ate 8 biscuits and Shinky ate 10 biscuits. What fraction of biscuits did each eat? Who ate the least number of biscuits?

**Ans.** Number of biscuits Isha's contain packets = 8

Number of biscuits Preeti's contain packets = 12

Number of biscuits Shinky's contain packets = 15

Number of biscuits ate by Isha = 4

Number of biscuits ate by Preeti = 8

Number of biscuits ate by Shinky = 10

$$\text{Fraction of biscuits eaten by Isha} = \frac{4}{8} = \frac{1}{2}$$

$$\text{Fraction of biscuits eaten by Preeti} = \frac{8}{12} = \frac{2}{3}$$

$$\text{Fraction of biscuits eaten by Shinky} = \frac{10}{15} = \frac{2}{3}$$

Comparison of  $\frac{1}{2}, \frac{2}{3}, \frac{2}{3}$

LCM of 2, 3 and 3 = 6

To make same denotation

$$\frac{1 \times 3}{2 \times 3} = \frac{3}{6}, \frac{2 \times 2}{3 \times 2} = \frac{4}{6}, \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

$$\frac{3}{6} < \frac{4}{6} = \frac{4}{6}$$

Isha at least biscuits.

12. Arrange a, b, c in ascending order and d, e, f in descending order.

Arrange in ascending order :

- Ans. (a) Arranging  $\frac{1}{6}, \frac{5}{6}, \frac{7}{6}, \frac{9}{6}, \frac{17}{6}$  in ascending order.

We know that if the denominator of fractions are same, than the fraction with greater numerator is greater than the fraction with smaller numerator.

$$\frac{1}{6} < \frac{5}{6} < \frac{7}{6} < \frac{9}{6} < \frac{17}{6}$$

- (b) Arranging  $\frac{1}{11}, \frac{3}{11}, \frac{2}{11}, \frac{11}{11}, \frac{0}{11}, \frac{15}{11}$  in ascending order.

We know that if the denominator of fraction are same than the fraction with greater numerator is greater than fraction with small numerator.

$$\frac{0}{11} < \frac{1}{11} < \frac{2}{11} < \frac{3}{11} < \frac{11}{11} < \frac{15}{11}$$

- (c) Arranging  $\frac{1}{12}, \frac{1}{23}, \frac{1}{4}, \frac{1}{5}, \frac{1}{7}, \frac{1}{50}$  in ascending order.

We know that if number of two fractions have same numerators but different denominators; than the fraction with greater denominator is smaller.

Arrange in descending order  $\frac{1}{50} < \frac{1}{23} < \frac{1}{12} < \frac{1}{7} < \frac{1}{5} < \frac{1}{4}$

- (d) Arranging  $\frac{5}{6}, \frac{5}{11}, \frac{5}{8}, \frac{5}{2}, \frac{5}{14}, \frac{5}{19}$  order in descending order.

We know that if numerator of fractions are same, than the fraction with smaller denominator is greater than the fraction denominator.

$$\frac{5}{2} > \frac{5}{6} > \frac{5}{8} > \frac{5}{11} > \frac{5}{14} > \frac{5}{19}$$

- (e) Arrange  $\frac{3}{2}, \frac{1}{5}, \frac{1}{4}, \frac{5}{8}$  in descending order.

LCM of denominator = 2, 5, 4, 8

Here, given fractions are in like fraction.

Denominators of the fractions are 2, 5, and 8

We convert  $\frac{3}{2}, \frac{1}{5}, \frac{1}{4}$  and  $\frac{5}{8}$  into like fraction having 40 as

denominator.

$$\frac{3}{2} = \frac{3 \times 20}{2 \times 20} = \frac{60}{40}; \frac{1}{5} = \frac{1 \times 8}{5 \times 8} = \frac{8}{40}$$

$$\frac{1}{4} = \frac{1 \times 10}{4 \times 10} = \frac{10}{40} \text{ and } \frac{5}{8} = \frac{5 \times 5}{8 \times 5} = \frac{25}{40}$$

$$60 > 25 > 10 > 8$$

So,  $\frac{60}{40} > \frac{25}{40} > \frac{10}{40} > \frac{8}{40}$

$\frac{3}{2} > \frac{5}{8} > \frac{1}{4} > \frac{1}{5}$  are in descending order.

2	2, 5, 4, 8
2	1, 5, 2, 4
2	1, 5, 1, 2
5	1, 5, 1, 1
	1, 1, 1, 1

$$= 2 \times 2 \times 2 \times 5 = 40$$



(f)  $\frac{2}{7}, \frac{2}{5}, \frac{0}{7}$  and  $\frac{6}{10}$  are unlike factors

Denominator of fractions are 7, 5, 7, 10

LCM of denominator =  $2 \times 5 \times 7 = 70$

We convert  $\frac{2}{7}, \frac{2}{5}, \frac{0}{7}$  and  $\frac{6}{10}$  in like fraction having 70 as

denominator.

$$\frac{2}{7} = \frac{2 \times 10}{7 \times 10} = \frac{20}{70}, \quad \frac{2}{5} = \frac{2 \times 14}{5 \times 14} = \frac{28}{70}$$

$$\frac{0}{7} = \frac{0 \times 10}{7 \times 10} = \frac{0}{70}, \quad \frac{6}{10} = \frac{6 \times 7}{10 \times 7} = \frac{42}{70}$$

$$42 > 28 > 20 > 0$$

So,  $\frac{42}{70} > \frac{28}{70} > \frac{20}{70} > \frac{0}{70}$

$\frac{6}{10} > \frac{2}{5} > \frac{2}{7} > \frac{0}{70}$  are in descending order.

2	7, 5, 7, 10
5	7, 5, 7, 5
7	7, 1, 7, 1
	1, 1, 1, 1



## Exercise-5.4

1. Add the following.

**Ans.** (a)  $\frac{1}{2} + \frac{1}{10}$

(LCM of 2 and 10 = 10)

$$= \frac{5+1}{10} = \frac{6}{10} = \frac{3}{5}$$

(c)  $\frac{1}{4} + \frac{1}{20}$

(LCM of 4 and 20 = 20)

$$= \frac{5+1}{20} = \frac{6}{20} \text{ or } \frac{3}{10}$$

(b)  $\frac{1}{8} + \frac{1}{24}$

(LCM of 8 and 24 = 24)

$$= \frac{3+1}{24} = \frac{4}{24} = \frac{1}{6}$$

(d)  $\frac{1}{9} + \frac{1}{3}$

(LCM of 9 and 3 = 9)

$$= \frac{1+3}{9} = \frac{4}{9}$$

2. What should be added to the following to get 1?

**Ans.** (a) Let  $x$  should be added to  $\frac{3}{4}$  to get 1

$$\frac{3}{4} + x = 1$$

$$x = 1 - \frac{3}{4} = \frac{(1 \times 4) - 3}{4} = \frac{4 - 3}{4} = \frac{1}{4}$$

(b) Let  $x$  should be added to  $\frac{7}{50}$  to get 1

$$\frac{7}{50} + x = 1$$

$$x = 1 - \frac{7}{50} = \frac{(50 \times 1) - 7}{50} = \frac{50 - 7}{50} = \frac{43}{50}$$

(c) Let  $x$  should be added to  $\frac{8}{35}$  to get 1

$$\frac{8}{35} + x = 1$$



$$x = 1 - \frac{8}{35} = \frac{35-8}{35} = \frac{27}{35}$$

- (d) Let  $x$  should be added to  $\frac{81}{100}$  to get 1

$$x + \frac{81}{100} = 1$$

$$x = 1 - \frac{81}{100} = \frac{100-81}{100} = \frac{19}{100}$$

- (e) Let  $x$  should be added to  $\frac{7}{1000}$  to get 1

$$x + \frac{7}{1000} = 1$$

$$x = 1 - \frac{7}{1000} = \frac{1 \times 1000 - 7}{1000} = \frac{1000-7}{1000} = \frac{997}{1000}$$

- (f) Let  $x$  should be added to  $\frac{221}{225}$  to get 1

$$x + \frac{221}{225} = 1$$

$$x = 1 - \frac{221}{225} = \frac{225-221}{225} = \frac{4}{225}$$

- (g) Let  $x$  should be added to  $\frac{199}{200}$  to get 1

$$x + \frac{199}{200} = 1$$

$$x = 1 - \frac{199}{200} = \frac{200-199}{200} = \frac{1}{200}$$

- (h) Let  $x$  should be added to  $\frac{998}{1000}$  to get 1

$$x + \frac{998}{1000} = 1$$

$$x = 1 - \frac{998}{1000} = \frac{1000-998}{1000} = \frac{2}{1000} = \frac{1}{500}$$

3. Convert the following unlike fractions into like fractions and add them.

- Ans.** (a)  $\frac{2}{14} + \frac{1}{7}$  = By doing denominator same LCM of denominators 14 and 7 = 14

$$\frac{2}{14} = \frac{2 \times 1}{14 \times 1} = \frac{2}{14}; \quad \frac{1}{7} = \frac{1 \times 2}{7 \times 2} = \frac{2}{14}$$

$$\frac{2}{14} + \frac{2}{14} = \frac{2+2}{14} = \frac{4}{14} \text{ or } \frac{2}{7}$$

- (b)  $\frac{1}{8} + \frac{1}{24}$  = By doing denominator same LCM of denominators 8 and 24 = 24

$$\frac{1 \times 3}{8 \times 3} = \frac{3}{24}; \quad \frac{1 \times 1}{24 \times 1} = \frac{1}{24}$$

$$\frac{3}{24} + \frac{1}{24} = \frac{3+1}{24} = \frac{4}{24} \text{ or } \frac{1}{6}$$

- (c)  $\frac{1}{9} + \frac{1}{6}$  = By doing denominator same LCM of denominators 9 and 6 = 18

$$\frac{1 \times 2}{9 \times 2} = \frac{2}{18}; \quad \frac{1 \times 3}{6 \times 3} = \frac{3}{18}$$

$$\frac{2}{18} + \frac{3}{18} = \frac{2+3}{18} = \frac{5}{18}$$

(d)  $\frac{1}{2} + \frac{5}{8} =$  By doing denominator same LCM of denominators 2 and 8 = 8

$$\frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}; \quad \frac{5}{8} = \frac{5 \times 1}{8 \times 1} = \frac{5}{8}$$

$$\frac{4}{8} + \frac{5}{8} = \frac{4+5}{8} = \frac{9}{8} \text{ or } 1\frac{1}{8}$$

(e)  $1\frac{1}{4} + 3\frac{3}{4} = \frac{5}{4} + \frac{15}{4} = \frac{5+15}{4} = \frac{20}{4} = 5$

(f)  $8\frac{2}{3} + 5\frac{1}{4} = \frac{26}{3} + \frac{21}{4} =$  By doing denominator same LCM of denominators 3 and 4 = 12

$$\frac{26}{3} = \frac{26 \times 4}{3 \times 4} = \frac{104}{12}; \quad \frac{21}{4} = \frac{21 \times 3}{4 \times 3} = \frac{63}{12}$$

$$\frac{104}{12} + \frac{63}{12} = \frac{104+63}{12} = \frac{167}{12} \text{ or } 13\frac{11}{12}$$

(g)  $\frac{8}{3} + \frac{0}{7} + \frac{5}{7} + \frac{1}{2} =$  By doing denominator same LCM of denominators 3, 7, 7, 2 = 42

$$\frac{8 \times 14}{3 \times 14} = \frac{112}{42}; \quad \frac{0}{7} = \frac{0 \times 6}{7 \times 6} = \frac{0}{42}; \quad \frac{5}{7} = \frac{5 \times 6}{7 \times 6} = \frac{30}{42}; \quad \frac{1}{2} = \frac{1 \times 21}{2 \times 21} = \frac{21}{42}$$

$$\frac{112}{42} + \frac{0}{42} + \frac{30}{42} + \frac{21}{42} = \frac{112+0+30+21}{42} = \frac{163}{42} \text{ or } 3\frac{37}{42}$$

(h)  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} =$  By doing denominator same LCM of denominators 2, 3, 4 = 12

$$\frac{1}{2} = \frac{1 \times 6}{2 \times 6} = \frac{6}{12}; \quad \frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}; \quad \frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$$

$$\frac{6}{12} + \frac{4}{12} + \frac{3}{12} = \frac{6+4+3}{12} = \frac{13}{12}$$

4. Subtract the following :

Ans. (a)  $\frac{1}{1} - \frac{3}{7} = \frac{7-3}{7} = \frac{4}{7}$

(b)  $\frac{3}{4} - \frac{3}{8} = \frac{3 \times 2 - 3}{8} = \frac{6-3}{8} = \frac{3}{8}$

(c)  $\frac{1}{2} - \frac{1}{6} = \frac{3-1}{6} = \frac{2}{6} \text{ or } \frac{1}{3}$

(d)  $\frac{17}{10} - \frac{3}{2} = \frac{17-3 \times 5}{10} = \frac{17-15}{10} = \frac{2}{10} \text{ or } \frac{1}{5}$

(e)  $\frac{5}{24} - \frac{1}{24} = \frac{5-1}{24} = \frac{4}{24} = \frac{1}{6}$

(f)  $3\frac{3}{4} - 2\frac{1}{5} = \frac{15}{4} - \frac{11}{5} = \frac{15 \times 5 - 11 \times 4}{20}$   
 $= \frac{75-44}{20} = \frac{31}{20} \text{ or } 1\frac{11}{20}$

(g)  $8\frac{1}{4} - 2\frac{5}{6} = \frac{33}{4} - \frac{17}{6} = \frac{33 \times 3 - 17 \times 2}{12} = \frac{99-34}{12} = \frac{65}{12} \text{ or } 5\frac{5}{12}$

(h)  $8\frac{9}{14} - 6\frac{3}{14} = \frac{121}{14} - \frac{87}{14} = \frac{121-87}{14} = \frac{34}{14} \text{ or } \frac{17}{7} \text{ or } 2\frac{3}{7}$

5. Find the value of y :

Ans. (a)  $y + \frac{4}{9} = \frac{6}{9} \Rightarrow y = \frac{6}{9} - \frac{4}{9} = \frac{6-4}{9} = \frac{2}{9}$

(b)  $y + \frac{0}{5} = \frac{2}{5} \Rightarrow y = \frac{2}{5} - \frac{0}{5} = \frac{2-0}{5} = \frac{2}{5}$

$$(c) \ y - \frac{3}{17} = \frac{5}{17} \Rightarrow y = \frac{5}{17} + \frac{3}{17} = \frac{5+3}{17} = \frac{8}{17}$$

$$(d) \ y + \frac{4}{5} = 5 \frac{4}{5} \Rightarrow y + \frac{4}{5} = \frac{29}{5}, \ y = \frac{29}{5} - \frac{4}{5} = \frac{29-4}{5} = \frac{25}{5} = 5$$

$$(e) \ 8 + y = 8 \frac{1}{3} \Rightarrow 8 + y = \frac{25}{3}, \ y = \frac{25}{3} - 8 = \frac{25-24}{3} = \frac{1}{3}$$

$$(f) \ y - \frac{5}{8} = \frac{1}{4} \Rightarrow y = \frac{1}{4} + \frac{5}{8} = \frac{2+5}{8} = \frac{7}{8}$$

6. Subtract  $3\frac{1}{4}$  from  $4\frac{2}{3}$ .

**Ans.** Subtract  $3\frac{1}{4}$  from  $4\frac{2}{3}$

$$= \frac{13}{4} \text{ from } \frac{14}{3} = \frac{14}{3} - \frac{13}{4} = \frac{14 \times 4 - 13 \times 3}{12} = \frac{56 - 39}{12} = \frac{17}{12} \text{ or } 1\frac{5}{12}$$

7. Subtract  $4\frac{1}{3}$  from  $5\frac{1}{6}$ .

Subtract  $\frac{13}{3}$  from  $\frac{31}{6}$  or  $\frac{31}{6} - \frac{13}{3}$  (LCM of 3 and 6 = 6)

$$\frac{31 - 13 \times 2}{6} = \frac{31 - 26}{6} = \frac{5}{6}$$

8. Find the difference of  $\frac{15}{27}$  and  $\frac{7}{18}$ .

$$\frac{15}{27} - \frac{7}{18} = \frac{15 \times 2 - 7 \times 3}{54} = \frac{30 - 21}{54} = \frac{9}{54} \text{ or } \frac{1}{6}$$

9. Ahmed bought  $2\frac{7}{9}$  kg of mangoes and  $1\frac{5}{18}$  kg of apples. How much fruits did he buy in all?

**Ans.** Quantity of mangoes =  $2\frac{7}{9}$  kg or  $\frac{25}{9}$  kg                      Quantity of apples =  $1\frac{5}{18}$  kg or  $\frac{23}{18}$  kg

$$\text{Total quantity} = \frac{25}{9} + \frac{23}{18} = \frac{2 \times 25 + 23}{18} = \frac{50 + 23}{18} = \frac{73}{18} = 4\frac{1}{18} \text{ kg}$$

10. From a piece of  $10\frac{3}{4}$  m long ribbon,  $2\frac{4}{5}$  m is cut. Find the length of the remaining ribbon.

**Ans.** Length of piece of ribbon =  $10\frac{3}{4}$  m or  $\frac{43}{4}$  m                      Cut ribbon =  $2\frac{4}{5}$  m or  $\frac{14}{5}$  m

$$\begin{aligned} \text{Length of the remaining ribbon} &= \frac{43}{4} - \frac{14}{5} \text{ m} \\ &= \frac{43 \times 5 - 14 \times 4}{20} \text{ m} = \frac{215 - 56}{20} = \frac{159}{20} \text{ m} = 7\frac{19}{20} \text{ m} \end{aligned}$$

11. The perimeter of a triangle is  $15\frac{1}{7}$  m. If the sum of its two sides is  $9\frac{1}{14}$  m, find the length of the third side.

**Ans.** Perimeter of a triangle =  $15\frac{1}{7}$  m or  $\frac{106}{7}$  m                      Sum of two sides =  $9\frac{1}{14}$  m =  $\frac{127}{14}$  m

$$\text{length of third side} = \frac{106}{7} - \frac{127}{14} = \frac{106 \times 2 - 127}{14} = \frac{212 - 127}{14} = \frac{85}{14} \text{ or } 6\frac{1}{14} \text{ cm}$$

Thus length of third side of triangle  $6\frac{1}{14}$  cm.

12. Sarika's house is  $5\frac{2}{3}$  km from her college. She covers  $4\frac{1}{2}$  km by metro train and the remaining by rickshaw. How much distance does she cover by rickshaw?

Ans. Distance between Sarika's house and her college =  $5\frac{2}{3}$  km or  $\frac{17}{3}$  km

Distance covered by metro train =  $4\frac{1}{2}$  km or  $\frac{9}{2}$  km

Remaining distance covered by rickshaw =  $\frac{17}{3} - \frac{9}{2} = \frac{17 \times 2 - 9 \times 3}{6} = \frac{34 - 27}{6} = \frac{7}{6}$  km

Sarika covered  $\frac{7}{6}$  km or  $1\frac{1}{6}$  km by rickshaw.

13. A piece of wire  $\frac{14}{15}$  metre long broke into two pieces. One piece was  $\frac{1}{3}$  metre long. How long was the other piece?

Ans. Length of total wire =  $\frac{14}{15}$  m

Length of one piece wire =  $\frac{1}{3}$  m

Length of second piece wire =  $\frac{14}{15} - \frac{1}{3} \text{ m} = \frac{14 - 1 \times 5}{15} \text{ m} = \frac{14 - 5}{15} = \frac{9}{15} \text{ m}$  or  $\frac{3}{5}$  m

14. Geeta bought  $3\frac{1}{2}$  kg potatoes,  $2\frac{1}{4}$  kg onions and  $1\frac{1}{2}$  kg tomatoes. Find the total weight of vegetables purchased by Geeta.

Ans. Quantity of potatoes =  $3\frac{1}{2}$  kg or  $\frac{7}{2}$  kg

Quantity of onions =  $2\frac{1}{4}$  kg or  $\frac{9}{4}$  kg

Quantity of tomatoes =  $1\frac{1}{2}$  kg or  $\frac{3}{2}$  kg

Total quantity of vegetables =  $\frac{7}{2} + \frac{9}{4} + \frac{3}{2} = \frac{7 \times 2 + 9 \times 1 + 3 \times 2}{4} = \frac{14 + 9 + 6}{4} = \frac{29}{4} \text{ kg} = 7\frac{1}{4} \text{ kg}$

Geeta bought  $7\frac{1}{4}$  kg vegetables.

### I. MCQs : Choose the correct option :

1. (b)    2. (a)    3. (d)    4. (a)    5. (c)    6. (a)    7. (b)    8. (d)

### II. Fill in the blanks :

1. A mixed fraction can be converted into **improper** fraction.
2. In two like fractions, the one having the greater numerator is **greater**.
3. Fractions having different denominators are called **unlike fractions**.
4. A fraction is said to be in **simplest or lowest** form if its numerator and denominator are , **prime numbers**.
5. Two unlike fractions can be added by first converting them into **like** fractions.

### III. State True (T)/False (F) :

1. F    2. T    3. T    4. T    5. F

## HOTS

Let number of student =  $x$

$$\text{Number of girls} = \frac{4}{9}x$$

$$\begin{aligned} \text{Number of boys} &= \frac{4}{9}x + 17 \\ &= \frac{4x + 17 \times 9}{9} \\ &= \frac{4x + 153}{9} \end{aligned}$$

$$\begin{aligned} \text{Total student} &= \frac{4x}{9} + \frac{4x + 153}{9} = x \\ \frac{4x + 4x + 153}{9} &= x \end{aligned}$$

$$\frac{8x + 153}{9} = x$$

$$8x + 153 = 9x$$

$$153 = 9x - 8x$$

$$153 = x$$

Number of students = 153

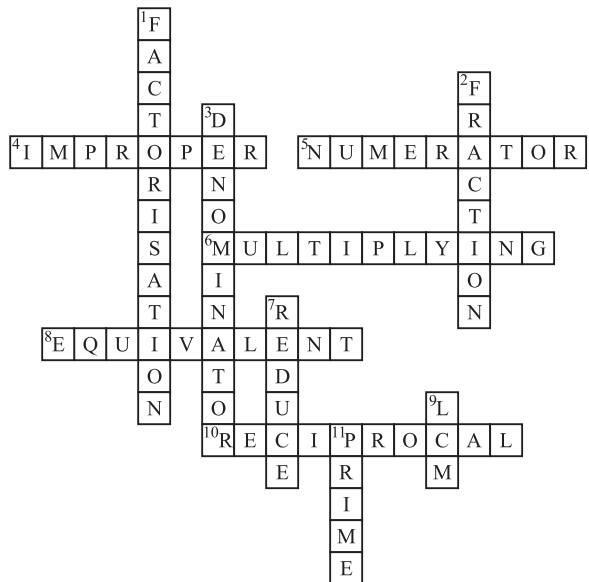
## Puzzle : Fill in the blanks to fill the crossword.

### ACROSS →

4. **Improper** fractions have larger numerator than the denominator.
5. Tells how many equal parts are used, shaded, etc. **Numerator**
6. Common denominators are not required while **multiplying** two fractions.
8. Fractions that have the same value are **equivalent** fractions.
10. The product of a number and its **reciprocal** equals one.

### DOWN ↓

1. Prime **factorisation** is when prime numbers are multiplied together to get the original number.
2. Part of a Whole is a **fraction**.
3. Tells how many equal parts make one whole. **Denominators**
7. To change a fraction to its lowest terms. **Reduce**
9. It is useful in finding the least common denominator when adding unlike denominators. **LCM**
11. A whole number greater than 1 with only two factors is a **prime** number.





# Decimals

# 6

## Exercise-6.1

1. Write the following fractions in decimal form :

Ans. (a)  $\frac{5}{10} = 0.5$  (b)  $\frac{7}{10} = 0.7$  (c)  $\frac{3}{100} = 0.03$   
(d)  $\frac{57}{100} = 0.57$  (e)  $\frac{75}{1000} = 0.075$

2. Write the following decimals in words :

- (a) 35.6 = Thirty five point six  
(b) 14.25 = Fourteen point two five  
(c) 127.13 = One hundred twenty-seven point one three  
(d) 103.22 = One hundred three point two two  
(e) 715.104 = Seven hundred fifteen point one zero four

3. Write in decimal form :

- (a) Twelve-hundredths = 0.12  
(b) Twenty-three point zero five = 23.05  
(c) Nine point zero zero nine = 9.009  
(d) One hundred sixty-seven point three zero seven = 167.307

4. Fill in the boxes :

(a)  $3.69 = 3 + \frac{6}{10} + \frac{9}{100}$  (b)  $25.309 = 20 + 5 + \frac{3}{10} + \frac{9}{1000}$   
(c)  $47.906 = 40 + 7 + \frac{9}{10} + \frac{6}{1000}$  (d)  $83.708 = 80 + 3 + \frac{7}{10} + \frac{8}{1000}$   
(e)  $123.658 = 100 + 20 + 3 + \frac{6}{10} + \frac{5}{100} + \frac{8}{1000}$

5. Write in expanded form :

(a)  $6.23 = 6 + \frac{2}{10} + \frac{3}{100}$   
(b)  $10.049 = 10 + 0 + \frac{0}{10} + \frac{4}{100} + \frac{9}{1000} = 10 + \frac{4}{100} + \frac{9}{1000}$   
(c)  $44.444 = 40 + 4 + \frac{4}{10} + \frac{4}{100} + \frac{4}{1000}$   
(d)  $193.26 = 100 + 90 + 3 + \frac{2}{10} + \frac{6}{100}$   
(e)  $205.19 = 200 + 0 + 5 + \frac{1}{10} + \frac{9}{100} = 200 + 5 + \frac{1}{10} + \frac{9}{100}$



6. Write in short form :
- (a)  $0.8 + 0.07 + 0.009 = 0.879$   
 (b)  $3 + .008 + 0.0005 = 3.0085$   
 (c)  $30 + 1 + 0.2 + 0.08 = 31.28$   
 (d)  $10 + 7 + 0.5 + 0.02 + 0.006 = 17.526$   
 (e)  $30 + 9 + 0.008 + 0.0004 = 39.0084$
7. Give next three numbers in the sequence:
- (a) 1.1, 1.2, 1.3 **1.4, 1.5 1.6**  
 (b) 6.123, 6.124, 6.125, **6.126, 6.127, 6.128**  
 (c) 11.8, 11.9, 12.0, **12.1, 12.2, 12.3**  
 (d) 9.001, 9.02, 9.003, **9.004, 9.005, 9.006**  
 (e) 27.14, 27.15, 27.16, **27.17, 27.18, 27.19**
8. Write three equivalent decimals for the following:
- (a)  $0.6 = 0.60 = 0.600 = 0.6000$   
 (b)  $2.6 = 2.60 = 2.600 = 2.6000$   
 (c)  $130.5 = 130.50 = 130.500 = 130.5000$   
 (d)  $129.6 = 129.60 = 129.600 = 129.6000$

 **Exercise-6.2**

1. Compare using  $<$ ,  $>$  or  $=$  :
- (a)  $0.3 \leq 2.34$                       (b)  $0.5 \geq 0.15$                       (c)  $6.6 \geq 6.066$   
 (d)  $7.3 \equiv 7.30$                       (e)  $6.359 \leq 6.4$                       (f)  $0.81 \geq 0.18$   
 (g)  $9.099 < 9.99$                       (h)  $70.08 < 70.7$                       (i)  $96.550 = 96.55$
2. Convert the following unlike decimals into like decimals :
- (a) 1.200, 2.150, 5.123 are like decimals  
 (b) 6.050, 6.600, 6.007 are like fractions  
 (c) 8.600, 8.060, 8.006 are like decimals  
 (d) 3.150, 3.000, 3.627 are like decimals
3. Rewrite in ascending order :
- (a)  $0.04 < 0.14 < 1.04 < 1.14$                       (b)  $19.09 < 19.9 < 20 < 20.001$   
 (c)  $6 < 6.23 < 6.32 < 6.4$                       (d)  $1.945 < 19.4 < 19.45 < 194.5$
4. Convert the following decimals into fractions :
- (a)  $1.8 = \frac{18}{10} = 1\frac{8}{10} = 1\frac{4}{5}$                       (b)  $0.05 = \frac{5}{100} = \frac{1}{20}$   
 (c)  $0.55 = \frac{55}{100} = \frac{11}{20}$                       (d)  $1.66 = \frac{166}{100} = \frac{83}{50} = 1\frac{33}{50}$   
 (e)  $0.125 = \frac{125}{1000} = \frac{1}{8}$                       (f)  $0.038 = \frac{38}{1000} = \frac{19}{500}$   
 (g)  $21.26 = \frac{2126}{100} = 21\frac{26}{100} = 21\frac{13}{50}$                       (h)  $87.001 = \frac{87001}{1000} = 87\frac{1}{1000}$
5. Convert the following fractions into decimals :
- (a)  $\frac{7}{10} = 0.7$                       (b)  $\frac{23}{10} = 2.3$                       (c)  $\frac{153}{10} = 15.3$                       (d)  $\frac{12}{100} = 0.12$



$$(e) \frac{8}{100} = 0.08 \quad (f) \frac{1030}{100} = 10.30 \quad (g) \frac{30}{1000} = 0.030 \quad (h) \frac{87}{1000} = 0.087$$

$$(i) \frac{9}{1000} = 0.009 \quad (j) \frac{255}{1000} = 0.255$$

6. Convert the following fractions into decimals by changing denominators to 10 or multiple of 10.

$$(a) \frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10} = 0.6 \quad (b) \frac{5}{2} = \frac{5 \times 5}{2 \times 5} = \frac{25}{10} = 2.5$$

$$(c) \frac{7}{4} = \frac{7 \times 25}{4 \times 25} = \frac{175}{100} = 1.75 \quad (d) \frac{1}{8} = \frac{1 \times 125}{8 \times 125} = \frac{125}{1000} = 0.125$$

$$(e) \frac{3}{25} = \frac{3 \times 4}{25 \times 4} = \frac{12}{100} = 0.12 \quad (f) \frac{17}{20} = \frac{17 \times 5}{20 \times 5} = \frac{85}{100} = 0.85$$

$$(g) \frac{33}{30} = \frac{33 \div 3}{30 \div 3} = \frac{11}{10} = 1.1 \quad (h) \frac{8}{125} = \frac{8 \times 8}{125 \times 8} = \frac{64}{1000} = 0.064$$

$$(i) 1\frac{5}{10} = \frac{10 \times 1 + 5}{10} = \frac{10 + 5}{10} = \frac{15}{10} = 1.5$$

$$(j) 2\frac{3}{5} = \frac{2 \times 5 + 3}{5} = \frac{13}{5} = \frac{13 \times 2}{5 \times 2} = \frac{26}{10} = 2.6$$

7. Convert the following fractions into decimals by the division method :

$$(a) \frac{1}{4} = \frac{5}{4} = 1.25$$

$$4 \overline{) 5} \left( 1.25 \right.$$

$$\begin{array}{r} -4 \\ \hline 10 \\ -8 \\ \hline 20 \\ -20 \\ \hline \times \end{array}$$

$$(b) \frac{5}{8} = 0.625$$

$$8 \overline{) 50} \left( 0.625 \right.$$

$$\begin{array}{r} -48 \\ \hline 20 \\ -16 \\ \hline 40 \\ -40 \\ \hline \times \end{array}$$

$$(c) \frac{3}{5} = 0.6$$

$$5 \overline{) 30} \left( 0.6 \right.$$

$$\begin{array}{r} -30 \\ \hline \times \end{array}$$

$$(d) \frac{12}{25} = 0.48$$

$$25 \overline{) 120} \left( 0.48 \right.$$

$$\begin{array}{r} -100 \\ \hline 200 \\ -200 \\ \hline \times \end{array}$$

$$(e) 9\frac{3}{5} = \frac{9 \times 5 + 3}{5} = \frac{48}{5} = 9.6$$

$$5 \overline{) 48} \left( 9.6 \right.$$

$$\begin{array}{r} -45 \\ \hline 30 \\ -30 \\ \hline \times \end{array}$$

$$(f) 7\frac{3}{4} = \frac{7 \times 4 + 3}{4} = \frac{31}{4} = 7.75$$

$$4 \overline{) 31} \left( 7.75 \right.$$

$$\begin{array}{r} -28 \\ \hline 30 \\ -28 \\ \hline 20 \\ -20 \\ \hline \times \end{array}$$

$$\begin{aligned} \text{(g)} \quad & 4\frac{1}{8} \\ & = \frac{4 \times 8 + 1}{8} \\ & = \frac{33}{8} \\ & = 4.125 \end{aligned}$$

$$\begin{array}{r} 8 \overline{) 33} \quad (4.125 \\ \underline{-32} \phantom{0} \\ 10 \phantom{0} \\ \underline{-8} \phantom{0} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ \times \end{array}$$

$$\begin{aligned} \text{(h)} \quad & 8\frac{6}{10} \\ & = \frac{8 \times 10 + 6}{10} \\ & = \frac{86}{10} \\ & = 8.6 \end{aligned}$$

$$\begin{array}{r} 10 \overline{) 86} \quad (8.6 \\ \underline{-80} \phantom{0} \\ 60 \phantom{0} \\ \underline{-60} \\ \times \end{array}$$

8. Put the following numbers into the appropriate boxes :

Numbers  $> \frac{1}{2} = 0.125, 0.449, 0.3, 0.089, 0.007$

Numbers  $> \frac{1}{2} = 0.9, 0.506, 0.867$

## Exercise-6.3

1. Add the following :

$$\begin{array}{r} \text{(a)} \quad 12.03 + 0.170 \\ 12.03 \\ + 0.170 \\ \hline 12.200 \end{array}$$

$$\begin{array}{r} \text{(b)} \quad 500 + 0.5 \\ 500.0 \\ + 0.5 \\ \hline 500.50 \end{array}$$

$$\begin{array}{r} \text{(c)} \quad 2.167 + 3.64 \\ 2.167 \\ + 3.640 \\ \hline 5.807 \end{array}$$

$$\begin{array}{r} \text{(d)} \quad 6.3 + 12.37 \\ 6.30 \\ + 12.37 \\ \hline 18.67 \end{array}$$

$$\text{(e)} \quad 14.354 + 19.109$$

$$\begin{array}{r} 14.354 \\ + 19.109 \\ \hline 33.463 \end{array}$$

$$\text{(f)} \quad 106.778 + 27.653$$

$$\begin{array}{r} 106.778 \\ + 27.653 \\ \hline 134.431 \end{array}$$

$$\text{(g)} \quad 3.58 + 8.9 + 4.13$$

$$\begin{array}{r} 3.58 \\ 8.90 \\ + 4.13 \\ \hline 16.61 \end{array}$$

$$\text{(h)} \quad 16.5 + 26.47 + 3.9$$

$$\begin{array}{r} 16.50 \\ 26.47 \\ + 3.90 \\ \hline 46.87 \end{array}$$

2. Subtract the following :

$$\begin{array}{r} \text{(a)} \quad 6 - 0.66 \\ 6.00 \\ - 0.66 \\ \hline 5.34 \end{array}$$

$$\begin{array}{r} \text{(b)} \quad 2 - 1.15 \\ 2.00 \\ - 1.15 \\ \hline 0.85 \end{array}$$

$$\begin{array}{r} \text{(c)} \quad 12 - 7.89 \\ 12.00 \\ - 7.89 \\ \hline 4.11 \end{array}$$

$$\begin{array}{r} \text{(d)} \quad 91.001 - 72.900 \\ 91.001 \\ - 72.900 \\ \hline 18.101 \end{array}$$

$$\text{(e)} \quad 11.111 - 1.1111$$

$$\begin{array}{r} 11.1110 \\ - 1.1111 \\ \hline 9.9999 \end{array}$$

$$\text{(f)} \quad 100.000 - 99.999$$

$$\begin{array}{r} 100.000 \\ - 99.999 \\ \hline 00.001 \end{array}$$

$$\text{(g)} \quad 300.6 - 197.715$$

$$\begin{array}{r} 300.600 \\ - 197.715 \\ \hline 102.885 \end{array}$$

$$\text{(h)} \quad 108.032 - 86.8$$

$$\begin{array}{r} 108.032 \\ - 86.800 \\ \hline 21.232 \end{array}$$

3. Simplify the following :

(a)  $3 - 3.3 + 2.8$

$$\begin{array}{r} 3.00 \\ + 2.80 \\ \hline 5.80 \end{array} \quad \begin{array}{r} 5.80 \\ - 3.30 \\ \hline 2.50 \end{array}$$

$\therefore 3 - 3.3 + 2.8 = 2.50$

(c)  $3.28 + 6.23 - 4.9$

$$\begin{array}{r} 3.28 \\ + 6.23 \\ \hline 9.51 \end{array} \quad \begin{array}{r} 9.51 \\ - 4.90 \\ \hline 4.61 \end{array}$$

$\therefore 3.28 + 6.23 - 4.9 = 4.61$

(e)  $6.3 + 4 - 3.5$

$$\begin{array}{r} 6.3 \\ + 4.0 \\ \hline 10.3 \end{array} \quad \begin{array}{r} 10.3 \\ - 3.5 \\ \hline 6.8 \end{array}$$

$\therefore 6.3 + 4 - 3.5 = 6.8$

(g)  $12.121 + 121.21 - 121.12$

$$\begin{array}{r} 12.121 \\ + 121.210 \\ \hline 133.331 \end{array} \quad \begin{array}{r} 133.331 \\ - 121.120 \\ \hline 12.211 \end{array}$$

$\therefore 12.121 + 121.21 - 121.12 = 12.211$

(i)  $43.16 + 493.28 - 507.34$

$$\begin{array}{r} 43.16 \\ + 493.28 \\ \hline 536.44 \end{array} \quad \begin{array}{r} 536.44 \\ - 507.34 \\ \hline 29.10 \end{array}$$

$\therefore 43.16 + 493.28 - 507.34 = 29.10$

(b)  $2.9 + 1.2 - 3.5$

$$\begin{array}{r} 2.9 \\ + 1.2 \\ \hline 4.1 \end{array} \quad \begin{array}{r} 4.1 \\ - 3.5 \\ \hline 0.6 \end{array}$$

$\therefore 2.9 + 1.2 - 3.5 = 0.6$

(d)  $2.36 - 3.24 + 4.57$

$$\begin{array}{r} 2.36 \\ + 4.57 \\ \hline 6.93 \end{array} \quad \begin{array}{r} 6.93 \\ - 3.24 \\ \hline 3.69 \end{array}$$

$\therefore 2.36 - 3.24 + 4.57 = 3.69$

(f)  $6 - 12.237 + 8.46$

$$\begin{array}{r} 6.00 \\ + 8.46 \\ \hline 14.46 \end{array} \quad \begin{array}{r} 14.460 \\ - 12.237 \\ \hline 2.223 \end{array}$$

$\therefore 6 - 12.237 + 8.46 = 2.223$

(h)  $24 - 27.047 + 15.26$

$$\begin{array}{r} 24.00 \\ + 15.26 \\ \hline 39.26 \end{array} \quad \begin{array}{r} 39.260 \\ - 27.047 \\ \hline 12.213 \end{array}$$

$\therefore 24 - 27.047 + 15.26 = 12.213$

(j)  $101.28 + 29.19 - 30.27$

$$\begin{array}{r} 101.28 \\ + 29.19 \\ \hline 130.47 \end{array} \quad \begin{array}{r} 130.47 \\ - 30.27 \\ \hline 100.20 \end{array}$$

$\therefore 101.28 + 29.19 - 30.27 = 100.20$

4. What should be added to 6.125 to get 10?

Ans.

$$\begin{array}{r} 10.000 \\ - 6.125 \\ \hline 3.875 \end{array}$$

$\therefore 3.875$  should be added to 6.125 to get 10

5. What should be subtracted from 102.55 to get the greatest two-digit numbers?

Greatest two-digit number = 99  $102.55$

Ans.

$$\begin{array}{r} 102.55 \\ - 99.00 \\ \hline 3.55 \end{array}$$

$\therefore 3.55$  should be subtracted from 102.55 to get greatest two-digit number

6. Subtract the sum of 0.0016 and 993.450 from 1000.

Ans.

$$\begin{array}{r} 0.0016 \\ + 993.4500 \\ \hline 993.4516 \end{array} \quad \begin{array}{r} 1000.0000 \\ - 993.4516 \\ \hline 6.5484 \end{array}$$

7. The normal human body temperature is 98.6°F. If the temperature of a person rose to 102.69. how much above normal was his temperature?

$$\begin{aligned} \text{Temperature given} &= 102.69 \\ \text{Normal temperature} &= \underline{-98.60} \\ \text{Temperature above normal} &= \underline{4.09} \end{aligned}$$

8. Subtract the sum of 5.39 and 8.06 from 16.

$$\begin{array}{r} 5.39 \\ + 8.06 \\ \hline 13.45 \end{array} \qquad \begin{array}{r} 16.00 \\ - 13.45 \\ \hline 2.55 \end{array}$$

9. Subtract the difference of 68.01 and 58.6 from their sum.

$$\begin{array}{r} \text{Sum} \\ 68.01 \\ + 58.60 \\ \hline 126.61 \end{array} \qquad \begin{array}{r} \text{Difference} \\ 68.01 \\ - 58.60 \\ \hline 9.41 \end{array} \qquad \therefore \begin{array}{r} 126.61 \\ - 9.41 \\ \hline 117.20 \end{array}$$

10. The maximum temperature of Delhi on Thursday was 39.2°C and on Wednesday, it was 27.6°C. Find the temperature difference of these two days.

$$\begin{aligned} \text{Temperature on thursday} &= 39.2^\circ\text{C} \\ \text{Temperature on wednesday} &= \underline{-27.6^\circ\text{C}} \\ \text{difference} &= \underline{1.6^\circ\text{C}} \end{aligned}$$

### I. MCQs : Choose the correct options :

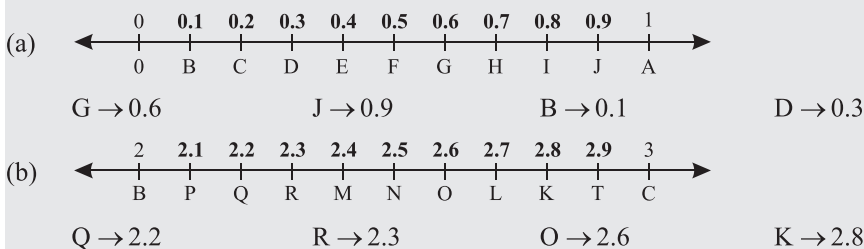
1. (b) 2. (a) 3. (c) 4. (c) 5. (d) 6. (d) 7. (c) 8. (b) 9. (c) 10. (b)

### II. Match the following :

Colume 'A'	Colume 'B'
(a) $\frac{16}{100}$	(i) 35.89
(b) $24\frac{3}{5}$	(ii) 4.40000
(c) 4.4	(iii) 24.6
(d) $30 + 5 + \frac{8}{10} + \frac{9}{100}$	(iv) 0.35 m
(e) 35 cm	(v) 0.16

### Mental Maths :

Write the decimals represented by the given points on the number line.



### Puzzle

The number is **2 5 . 4 3**



# Ratio and Proportion

# 7



## Exercise-7.1

1. Fill in the blanks :

- (a) Ratio has **no** unit.
- (b) The first term of a ratio is called as **antecedent**.
- (c) The second term of a ratio is called the **consequent**.

2. Express each one of the following ratios in its simplest form:

- (a)  $65 : 91 = \frac{65}{91} = \frac{5}{7}$  or  $5 : 7$
- (b)  $50 : 225 = \frac{50}{225} = \frac{2}{9}$  or  $2 : 9$
- (c)  $450 : 270 = \frac{450}{270} = \frac{5}{3}$  or  $5 : 3$
- (d)  $500 : 1000 = \frac{500}{1000} = \frac{1}{2}$  or  $1 : 2$

3. Find the ratios of the following :

- (a)  $\frac{4\text{ cm}}{5\text{ m}} = \frac{4\text{ cm}}{500\text{ cm}} = \frac{4}{500} = \frac{1}{125} = 1 : 125$
- (b)  $\frac{45\text{ kg}}{180\text{ kg}} = \frac{45}{180} = \frac{1}{4} = 1 : 4$
- (c)  $\frac{3.6\text{ m}}{54\text{ m}} = \frac{36}{540} = \frac{1}{15} = 1 : 15$
- (d)  $\frac{70\text{ minutes}}{210\text{ seconds}} = \frac{70 \times 60\text{ seconds}}{210\text{ seconds}} = \frac{4200}{210} = \frac{20}{1} = 20 : 1$
- (e)  $\frac{25\text{ Paise}}{\text{₹ } 50} = \frac{25\text{ Paise}}{5000\text{ Paise}} = \frac{1}{200} = 1 : 200$
- (f)  $\frac{2.3}{9.2} = \frac{23}{92} = \frac{1}{4} = 1 : 4$

4. Compare the following ratios:

(a)  $1 : 5$  or  $3 : 17$   
 $\frac{1}{5}$  or  $\frac{3}{17}$

$1 \times 17$  or  $3 \times 5$   
 $\therefore 17 > 15$   
 $\therefore 1 : 5 > 3 : 17$

(c)  $2 : 15$  or  $4 : 7$

$\frac{2}{15}$  or  $\frac{4}{7}$

$2 \times 7$  or  $4 \times 15$

$\therefore 14 < 60$

$\therefore 2 : 15 < 4 : 7$

(b)  $5 : 13$  or  $2 : 5$

$\frac{5}{13}$  or  $\frac{2}{5}$

$5 \times 5$  or  $2 \times 13$

$\therefore 25 < 26$

$\therefore 5 : 13 < 2 : 5$

(d)  $11 : 9$  or  $3 : 5$

$\frac{11}{9}$  or  $\frac{3}{5}$

$11 \times 5$  or  $3 \times 9$

$\therefore 55 > 27$

$\therefore 11 : 9 > 3 : 5$



5. In each of the following which ratio is smaller?

(a)  $10 : 7$  or  $15 : 22$   
 $\frac{10}{7}$  or  $\frac{15}{22}$

$10 \times 22$  or  $15 \times 7$   
 $\therefore 220 > 105$   
 $\therefore 10 : 7 > 15 : 22$

(c)  $9 : 16$  or  $4 : 11$   
 $\frac{9}{16}$  or  $\frac{4}{11}$

$9 \times 11$  or  $4 \times 16$   
 $\therefore 99 > 64$   
 $\therefore 9 : 16 > 4 : 11$

(b)  $5 : 9$  or  $23 : 14$   
 $\frac{5}{9}$  or  $\frac{23}{14}$

$5 \times 14$  or  $23 \times 9$   
 $\therefore 70 < 207$   
 $\therefore 5 : 9 < 23 : 14$

(d)  $7 : 21$  or  $2 : 5$   
 $\frac{7}{21}$  or  $\frac{2}{5}$

$7 \times 5$  or  $2 \times 21$   
 $\therefore 35 < 41$   
 $\therefore 7 : 21 < 2 : 5$

6. Which ratio is greater ?

(a)  $1 : 2$  or  $3 : 7$   
 $\frac{1}{2}$  or  $\frac{3}{7}$

$1 \times 7$  or  $3 \times 2$   
 $\therefore 7 > 6$   
 $\therefore 1 : 2 > 3 : 7$

(c)  $3 : 4$  or  $5 : 6$   
 $\frac{3}{4}$  or  $\frac{5}{6}$

$3 \times 6$  or  $5 \times 4$   
 $\therefore 18 < 20$   
 $\therefore 3 : 4 < 5 : 6$

(b)  $5 : 13$  or  $2 : 5$   
 $\frac{5}{13}$  or  $\frac{2}{5}$

$5 \times 5$  or  $2 \times 13$   
 $\therefore 25 < 26$   
 $\therefore 5 : 13 < 2 : 5$

(d)  $9 : 11$  or  $7 : 3$   
 $\frac{9}{11}$  or  $\frac{7}{3}$

$9 \times 3$  or  $7 \times 11$   
 $\therefore 27 < 77$   
 $\therefore 9 : 11 < 7 : 3$

7. Divide ₹ 3500 Among A, B and C in the ratio 3 : 2 : 2.

**Ans.** Sum of the terms of ratio =  $3 + 2 + 2 = 7$

A get =  $\frac{3}{7} \times 3500 = 3 \times 500 = ₹ 1500$

B get =  $\frac{2}{7} \times 3500 = ₹ 1000$

C get =  $\frac{2}{7} \times 3500 = 2 \times 500 = ₹ 1000$

8. Distribute 1000 in two part such that one part is  $\frac{12}{13}$ th of the other.

**Ans.** Ratio is  $\frac{12}{13} : 1$  or  $12 : 13$

$\therefore$  Sum of the terms of ratio =  $12 + 13 = 25$

Ist part =  $\frac{12}{25} \times 1000 = 12 \times 40 = 480$

IInd part =  $\frac{13}{25} \times 1000 = 13 \times 40 = 520$

9. Two numbers are in the ratio 2 : 5. If the sum of the numbers is 49, find the numbers.

**Ans.** Sum of the terms of ratio =  $2 + 5 = 7$

Ist number =  $\frac{2}{7} \times 49 = 2 \times 7 = 14$

$$\text{Ind number} = \frac{5}{7} \times 49 = 5 \times 7 = 35$$

10. The length of a classroom is 18.6 m and its breadth is 6.2 m. Find the ratio of its length to its breadth.

Ans.  $\frac{18.6 \text{ m}}{6.2 \text{ m}} = \frac{186}{62} = \frac{3}{1}$  or 3 : 1

11. Express each of the following as instructed:

Ans. (a) Defective bulbs = 25

Good bulbs =  $70 - 25 = 45$

$\therefore$  ratio =  $\frac{25}{45} = \frac{5}{9} = 5 : 9$

(b)  $\frac{\text{Passing students}}{\text{Appeared students}} = \frac{3}{\frac{4}{1}} = \frac{3}{4} = 3 : 4$

(c)  $\frac{36}{42} = \frac{6}{7}$  or 6 : 7

(d)  $\frac{AB}{CD} = \frac{9}{7} = 9 : 7$

12. The scale of a map is 1 : 3000000. What is the actual distance between the two towns if they are 3 cm apart on the map?

Ans.  $\frac{1}{3000000} = \frac{3}{x}$

$x = 3 \times 3000000 \Rightarrow x = 9000000 \text{ cm}$

$x = 90000 \text{ m} \Rightarrow x = 90 \text{ km}$

$\therefore$  towns are 90 km apart in actual

13. The ratio of the heights of two brothers is 8 : 7. If the height of the shorter brother is 161 cm, what is the height of the taller one?

Ans. Let height of taller brother =  $8x$

Let height of shorter brother =  $7x$

$\therefore$  shorter brother = 161 cm

$7x = 161 \Rightarrow x = 23$

$\therefore$  height of taller brother =  $8x = 8 \times 23 = 184 \text{ cm}$

## Exercise-7.2

1. Which of the following are true by the rule of proportion:

(a)  $10 : 15 :: 20 : 25$

Product of Means =  $15 \times 20 = 300$

Product of Extremes =  $10 \times 25 = 250$

$\therefore$  Product of means  $\neq$  Product of extremes

$\therefore$  False

(b)  $24 : 96 :: 16 : 54$

Product of Means =  $96 \times 16 = 1536$

Product of Extremes =  $24 \times 54 = 1296$

$\therefore$  Product of means  $\neq$  Product of extremes

$\therefore$  False

(c)  $1 : 2 :: 3 : 6$

Product of means =  $2 \times 3 = 6$

Product of Extremes =  $1 \times 6 = 6$

- $\therefore$  Product of means = Product of extremes  
 $\therefore$  False
- (d)  $75 : 150 :: 3 : 18$   
 Product of means =  $150 \times 3 = 450$   
 Product of Extremes =  $75 \times 18 = 1350$   
 $\therefore$  Product of means  $\neq$  Product of extremes  
 $\therefore$  False
- (e)  $63 : 105 :: 18 : 30$   
 Product of means =  $105 \times 18 = 1890$   
 Product of extremes =  $63 \times 30 = 1890$   
 $\therefore$  Product of means = Product of extremes  
 $\therefore$  True
- (f)  $5 : 25 :: 30 : 150$   
 Product of means =  $25 \times 30 = 750$   
 Product of Extremes =  $5 \times 150 = 750$   
 $\therefore$  Product of means = Product of extremes  
 $\therefore$  True
- (g)  $66 : 22 :: 22 : 66$   
 Product of means =  $22 \times 22 = 484$   
 Product of extremes =  $66 \times 66 = 4356$   
 $\therefore$  Product of means  $\neq$  Product of extremes  
 $\therefore$  Not true
- (h)  $18 : 24 :: 15 : 20$   
 Product of means =  $24 \times 15 = 360$   
 Product of extremes =  $18 \times 20 = 360$   
 $\therefore$  Product of means = Product of extremes  
 $\therefore$  True

2. Find  $x$  in the following proportions:

- (a)  $169 : x :: x : 1$   
 Product of means = Product of extremes  
 $x \times x = 169 \times 1$   
 $x^2 = 169 \Rightarrow x = \sqrt{169} \Rightarrow x = 13$
- (b)  $80 : 32 :: x : 16$   
 Product of means = Product of extremes  
 $32 \times x = 16 \times 80 \Rightarrow x = \frac{16 \times 80}{32} \Rightarrow x = 40$
- (c)  $x : 3 :: 57 : 19$   
 Product of means = Product of extremes  
 $3 \times 57 = x \times 19 \Rightarrow \frac{3 \times 57}{19} = x \Rightarrow 9 = x$
- (d)  $18 : x :: 27 : 3$   
 Product of means = Product of extremes  
 $x \times 27 = 3 \times 18 \Rightarrow x = \frac{3 \times 18}{27} \Rightarrow x = 2$
- (e)  $125 : x :: x : 5$   
 Product of means = Product of extremes  
 $x \times x = 5 \times 125 \Rightarrow x^2 = 625 \Rightarrow x = \sqrt{625}$   
 $\Rightarrow x = 25$
- (f)  $10 : 15 :: 12 : x$   
 Product of means = Product of extremes



$$15 \times 12 = x \times 10 \Rightarrow \frac{15 \times 12}{10} = x \Rightarrow 18 = x$$

3. Find the fourth term of the following proportions:

(a) Let fourth proportion be  $x$

$$\therefore 21 : 27 :: 14 : x$$

Product of means = Product of extremes

$$27 \times 14 = x \times 21 \Rightarrow \frac{27 \times 14}{21} = x \Rightarrow 18 = x$$

$\therefore$  fourth proportion is 18.

(b) Let fourth proportion be  $x$

$$\therefore 57 : 76 :: 108 : x$$

$\therefore$  Product of means = Product of Extremes

$$\therefore 76 \times 108 = 57 \times x \Rightarrow \frac{76 \times 108}{57} = x \Rightarrow 144 = x$$

$\therefore$  fourth proportion is 144.

(c) Let the fourth proportion be  $x$

$$\therefore 3 : 9 :: x : 27 : x$$

$\therefore$  Product of means = Product of extremes

$$9 \times 27 = 3 \times x \Rightarrow \frac{9 \times 27}{3} = x \Rightarrow 81 = x$$

$\therefore$  fourth proportion is 81.

(d) Next fourth proportion be  $x$

$$\therefore 1 : 10 :: 100 : x$$

$\therefore$  Product of means = Product of Extremes

$$\therefore 10 \times 100 = 1 \times x \Rightarrow 1000 = x$$

$\therefore$  fourth proportion is 1000.

4. Write the extremes in the following:

(a) Extremes of  $4 : 5 :: 20 : 25$  are 4 and 25

(b) Extremes of  $5 : 7 :: 25 : 35$  are 5 and 35

(c) Extremes of  $16 : 24 :: 24 : 36$  are 16 and 36

(d) Extremes of  $50 : 150 :: 100 : 300$  are 50 and 300

5. Write the mean in the following:

(a) Means of  $25 : 5 :: 20 : 4$  are 5 and 20

(b) Means of  $1 : 4 :: 8 : 32$  are 4 and 8

(c) Means of  $25 : 30 :: 16 : 36$  are 30 and 16

(d) Means of  $15 : 32 :: 135 : 288$  are 32 and 135

6. Find the mean proportion between the numbers:

(a) Let mean proportion be  $x$

$$\therefore 36 : x :: x : 16$$

$\therefore$  Product of mean = Product of extremes

$$x \times x = 36 \times 16$$

$$x^2 = 36 \times 16$$

$$x = \sqrt{36 \times 16}$$

$$x = 6 \times 4$$

$$\Rightarrow x = 24$$

$\therefore$  mean proportion is 24.

(b) Let mean proportion be  $x$

$$\therefore 4 : x :: x : 9$$

$$\begin{aligned} \therefore \text{Product of means} &= \text{Product of extremes} \\ x \times x &= 4 \times 9 & x^2 &= 36 & x &= \sqrt{36} & x &= 6 \end{aligned}$$

$\therefore$  Mean proportion is 6.

(c) Let mean proportion be  $x$

$$\therefore 4 : x :: x : 16$$

$\therefore$  Product of means = Product of extremes

$$x \times x = 4 \times 16 \Rightarrow x^2 = 4 \times 16 \Rightarrow x = \sqrt{4 \times 16} \quad x = 8$$

$\therefore$  Mean proportion is 8.

(d) Let the mean proportion be  $x$

$$\therefore 125 : x :: x : 5$$

$\therefore$  Product of means = Product of Extremes

$$x \times x = 125 \times 5 \Rightarrow x^2 = 625$$

$$x = \sqrt{625} \Rightarrow x = 25$$

Mean proportion is 25.

(e) Let mean proportion be  $x$

$$\therefore 121 : x :: x : 100$$

$\therefore$  Product of means = Product of extremes

$$\therefore x \times x = 121 \times 100 \Rightarrow x^2 = 12100$$

$$x = \sqrt{12100} \Rightarrow x = 110$$

$\therefore$  Fourth proportion is 110.

(f) Let mean proportion be  $x$

$$\therefore 32 : x :: x : 50$$

$\therefore$  Product of means = Product of extremes

$$\therefore x \times x = 50 \times 32 \Rightarrow x^2 = 1600$$

$$x = \sqrt{1600} \Rightarrow x = 40$$

$\therefore$  Mean proportion is 40.

(g) Let mean proportion be  $x$

$$\therefore 4 : x :: x : 36$$

$\therefore$  Product of means = Product of extremes

$$\therefore x \times x = 36 \times 4 \Rightarrow x^2 = 36 \times 4$$

$$x^2 = \sqrt{36 \times 4} \Rightarrow x = 12$$

$\therefore$  Mean proportion is 12.

(h) Let mean proportion be  $x$

$$\therefore 25 : x :: x : 36$$

$\therefore$  Product of means = Product of extremes

$$x \times x = 36 \times 25$$

$$x^2 = 36 \times 25$$

$$x = \sqrt{36 \times 25} \Rightarrow x = 30$$

$\therefore$  Mean proportion is 30.

7. The first three terms of a proportion are 15, 20, 30. Find the fourth term.

**Ans.** Let fourth proportion be  $x$

$$\therefore 15 : 20 :: 30 : x$$

$\therefore$  Product of means = Product of Extremes

$$20 \times 30 = 15 \times x \Rightarrow \frac{20 \times 30}{15} = x$$

$$\Rightarrow 40 = x$$

$\therefore$  fourth proportion is 40.

8. Find the mean proportion of 9 and 4.

Ans. Let mean proportion be  $x$

$$\begin{aligned} \therefore 9 : x :: x : 4 &\Rightarrow x \times x = 4 \times 9 \\ x^2 = 36 &\Rightarrow x = 6 \end{aligned}$$

$\therefore$  mean proportion is 6.

9. The length and breadth of a rectangle are in the ratio 6 : 3. If its length is 80 cm, find its breadth.

Ans.  $l : b = 6 : 3$        $80 : b = 6 : 3$

$\therefore$  Product of means = Product of extremes

$$b \times 6 = 3 \times 80 \Rightarrow b = 40$$

$\therefore$  breadth = 40 cm

10. Find the second term of a proportion whose 1st, 3rd and 4th terms are 42, 70 and 35 respectively.

Ans. Let 2nd proportion be  $x$

$$\therefore 42 : x :: 70 : 35$$

$\therefore$  Product of means = Product of extremes

$$x \times 70 = 35 \times 42 \quad x = \frac{35 \times 42}{70} \quad x = 21$$

$\therefore$  2nd proportion is 21.

11. The map of a rectangular field is drawn on a scale 1 : 90. If the actual length of the field is 270 m, what will it be on the map?

Ans. Scale actual

$$1 : 90 :: x : 270$$

$\therefore$  Product of means = Product of extreme

$$90 \times x = 270 \times 1 \Rightarrow x = 3$$

$\therefore$  270 m represent 3 units on map.

12. A tin refined oil is 8 cm high and can contain 352 l of oil. The manufacturer increases the height of the tin to 12.5 cm. How many litres can the new tin hold?

Ans. High :  $l$  = high :  $l$

$$8 : 352 = 12.5 : l$$

$\therefore$  Product of means = Product of extremes

$$352 \times 12.5 = 8 \times l \Rightarrow \frac{352 \times 12.5}{8} = l$$

$$44 \times 12.5 = l \Rightarrow 550 = l$$

$\therefore$  12.5 cm high tin hold 550 litres of oil.



## Exercise-7.3

1. If 12 kg of sugar costs ₹ 264, what will 31 kg of sugar cost?

Ans. Cost of 12 kg sugar = ₹ 264

$$\text{Cost of 1 kg sugar} = ₹ \frac{264}{12}$$

$$\text{Cost of 31 kg sugar} = ₹ \frac{264}{12} \times 31 = ₹ 682$$

2. The price of 15 articles is ₹ 360. Find the price of 21 articles.

Ans. Price of 15 articles = ₹ 360

$$\text{Price of 1 article} = ₹ \frac{360}{15}$$

$$\text{Price of 21 articles} = ₹ \frac{360}{15} \times 21 = ₹ 504$$



3. A car travels 180 km in 4 hours. How long will it take to travel 400 km? How far will it travel in 12 hours ?

**Ans.** (a) 180 km travelled in = 4 hours

$$1 \text{ km travelled in} = \frac{4}{180} \text{ hours}$$

$$\begin{aligned} 400 \text{ km travelled in} &= \frac{4}{180} \times 400 \text{ hours} \\ &= \frac{4}{180} \times 400 \times 60 \text{ minutes} = 8 \text{ hrs. } 53 \text{ min } 20 \text{ sec} \end{aligned}$$

(b) In 4 hours car travels = 180 km

$$\text{In 1 hour car travels} = \frac{180}{4} \text{ km}$$

$$\text{In 12 hours car travels} = \frac{180}{4} \times 12 \text{ km} = 540 \text{ km}$$

4. The cost of 13 chairs is ₹ 6825. How many chairs can be purchased for ₹ 5250?

**Ans.** For ₹ 6825 chairs purchased = 13

$$\text{For ₹ 1 chairs purchased} = \frac{13}{6825}$$

$$\text{For ₹ 5250 chairs purchased} = \frac{13}{6825} \times 5250$$

$$\text{For ₹ 5250 chairs purchased} = 10.$$

5. A person saves ₹ 12522 in one year. How much does he save in 3 months?

**Ans.** In 12 months person saves = ₹ 12522

$$\text{In 1 month person saves} = ₹ \frac{12522}{12}$$

$$\text{In 3 months person saves} = ₹ \frac{12522}{12} \times 3 = ₹ 3130.50$$

6. If a dozen pens cost ₹ 15.00, how many pens can be bought for ₹ 43.75?

**Ans.** For ₹ 15 pens bought = 12

$$\text{For ₹ 1 pens bought} = \frac{12}{15}$$

$$\text{For ₹ 43.75 pens bought} = \frac{12}{15} \times 43.75$$

$$\text{For ₹ 43.5 pens bought} = 35.$$

7. If a rail journey of 84 km costs ₹ 189, how much should a journey of 136 km cost?

**Ans.** 84 km journey cost = ₹ 189

$$1 \text{ km journey cost} = ₹ \frac{189}{84}$$

$$136 \text{ km journey cost} = ₹ \frac{189}{84} \times 136$$

$$136 \text{ km journey cost} = ₹ 306.$$

8. If  $\frac{3}{5}$  quintal of rice costs ₹ 180, what will be the cost of  $\frac{5}{6}$  quintal of rice?

**Ans.** Cost of  $\frac{3}{5}$  quintal rice = ₹ 180

$$\text{Cost of 1 quintal rice} = ₹ \frac{180}{3/5}$$

$$\text{Cost of } \frac{5}{6} \text{ quintal rice} = ₹ \frac{180}{3/5} \times \frac{5}{6} = ₹ \frac{180 \times 5}{3} \times \frac{5}{6} = ₹ 250.$$

9. If 20 men assemble 8 machines in a day, how many men are needed to assemble 12 such machines per day?

Ans. Mens needed for 8 machines = 20

$$\text{Mens needed for 1 machine} = \frac{20}{8}$$

$$\text{Mens needed for 12 machines} = \frac{20}{8} \times 12$$

$$\text{Mens needed for 12 machines} = 30.$$

10. A camp commandant estimates that he has enough food for 6 meals for each of 150 boys. If 30 more boys arrive unexpectedly, then how many meals can be supplied to each boy?

Ans. For 150 boys meals supplied = 6

$$\text{For 1 boys meals supplied} = 6 \times 150$$

$$\text{For 180 boys meals supplied} = \frac{6 \times 150}{180}$$

$$\text{For 180 boys meals supplied} = 5.$$

### I. MCQs : Choose the correct options :

1. (b) 2. (a) (c) 4. (a) 5. (b) 6. (a) 7. (b) 8. (c) 9. (b) 10. (d) 11. (b) 12. (c)

### II. Fill in the blanks :

1.  $2 : 4 :: \square : 10$

Let  $\square$  filled by  $x$

$$2 \times 10 = 4 \times x \Rightarrow 4x = 20 \Rightarrow x = \frac{20}{4} = 5$$

$$2 : 4 :: \mathbf{5} : 10$$

2.  $\square : 4 :: 2 : 8$

Let  $\square$  filled by  $x$

$$8 \times x = 4 \times 2 \Rightarrow x = \frac{4 \times 2}{8} = 1 \Rightarrow \mathbf{1} : 4 :: 2 : 8$$

3.  $1 : \square :: 3 : 15$

Let  $\square$  filled by  $x$

$$1 : x :: 3 : 15 \Rightarrow 3x = 15 \times 1$$

$$x = \frac{15}{3} = 5 \Rightarrow 1 : \mathbf{5} :: 3 : 15$$

4.  $4 : 7 :: 20 : \square$

Let  $\square$  filled by  $x$

$$4 : 7 :: 20 : x \Rightarrow 4x = 7 \times 20 \Rightarrow x = \frac{7 \times 20}{4} = 35$$

$$4 : 7 :: 20 : \mathbf{35}$$

5.  $6 : 1 :: \square : 2$

Let  $\square$  filled by  $x$

$$6 : 1 :: x : 2 \Rightarrow 6 \times 2 = 1 \times x \Rightarrow x = 12 \Rightarrow 6 : 1 :: 12 : \mathbf{2}$$

6.  $\square : 8 :: 1 : 4$

Let  $\square$  filled by  $x$

$$x : 8 :: 1 : 4 \Rightarrow 4 \times x = 8 \times 1 \Rightarrow x = \frac{8 \times 1}{4} = 2 \Rightarrow \mathbf{2} : 8 :: 1 : 4$$

7.  $7 : 10 \square 5 : 10$

(use any one sign out of  $>$ ,  $=$  or  $<$ )

$$\frac{7}{10} > \frac{5}{10} \quad \Rightarrow \quad 7 \times 10 > 5 \times 10 \quad \Rightarrow \quad 70 > 50$$

Now,  $7 : 10 > 5 : 10$

8.  $9 : 13 \square 126 : 210$

(use any one sign out of  $>$ ,  $=$  or  $<$ )

$$\begin{aligned} \frac{9}{13} &< \frac{126}{210} \\ 9 \times 210 &< 126 \times 13 \\ 1890 &< 1638 \\ 9 : 13 &< 126 : 210 \end{aligned}$$

### III. State True (T)/False (F) :

1. T    2. F    3. T    4. F    5. T



# Introduction to Algebra

# 8



## Exercise-8.1

1. Write the following in exponential form :

**Ans.** (a)  $-1 \times x \times x \times x \times y \times y = -x^3 y^2$

(c)  $p \times p \times \dots 9 \text{ times} = p^9$

(e)  $10 \times a \times a \times b \times b \times b \times a \times a \times b = 10a^4 b^4$

(g)  $-1 \times 3 \times w \times w \times x \times y \times y \times z = 3w^2 xy^2 z$

(i)  $5 \times 2 \times a \times a \times b \times b = 10a^2 b^2$

(b)  $7 \times a \times a \times a \times a \times b \times b \times b \times b = 7a^4 b^4$

(d)  $-2 \times p \times p \times p \times q \times q = -2p^3 q^2$

(f)  $2 \times p \times q \times q \times p \times q = 2p^2 q^3$

(h)  $\frac{3}{2} \times 4 \times q \times q \times r \times r \times s = 6q^2 r^2 s$

2. Following are in exponential form. Write them in product form :

**Ans.** (a)  $7x^3 = 7 \times x \times x \times x$

(c)  $-6ab^2 = -6 \times a \times b \times b$

(e)  $-xy^7 = -1 \times x \times y \times y \times y \times y \times y \times y \times y$

(g)  $-9pq^3 = -9 \times p \times q \times q \times q$

(i)  $-2q^3 r^3 = -2 \times q \times q \times q \times r \times r \times r$

(b)  $8a^3 b = 8 \times a \times a \times a \times b$

(d)  $p^5 = p \times p \times p \times p \times p$

(f)  $ab = a \times b$

(h)  $5x^2 y^3 = 5 \times x \times x \times y \times y \times y$

(j)  $12x^4 y^2 = 12 \times x \times x \times x \times x \times y \times y$

3. In each of the following expressions, pick out the variables and the constant :

(a) Constant =  $-2$ , Variable =  $x$

(c) Constant =  $1$ , Variable =  $x, y$

(e) Constant =  $-1$ , Variable =  $p, q$

(g) Constant =  $-6$ ; Variable =  $x, y$

(i) Constant =  $100$ , Variable =  $s$

(k) Constant =  $4$ , Variable =  $a, b$

(m) Constant =  $7$ , Variable  $x, y$

(b) Constant =  $7$ , Variable =  $a, b$

(d) Constant =  $0$

(f) Constant =  $10$ , Variable =  $s$

(h) Constant =  $6$ , Variable =  $p, q$

(j) Constant =  $2$ , Variable =  $x$

(l) Constant =  $1$ , Variable =  $a, x, y$

(n) Constant =  $-5$

4. Write the following in algebraic form :

**Ans.** (a)  $-9 - p$

(b)  $3(4 - 2q)$

(c)  $3j - 2k$

(d)  $(111 - 14m) - 18$

(e)  $\frac{3}{7}(4q - 9c)$

(f)  $\frac{2}{3}(10x) - 4z$



5. Write the following statements algebraically :

- Ans.** (a)  $5x + 6$  (b)  $(24 - x) - 2$  (c)  $8(x + 5)$  (d)  $8\left(\frac{x}{6} + 1\right)$   
 (e)  $10 - \frac{x}{40}$  (f)  $4 + (-3x)$  (g)  $3(4x - 8)$  (h)  $-3x - 2$   
 (i)  $(8x \div 2) + 7$  (j)  $3x - 1$

6. Vani scores  $x$  marks in English and 70 marks in Maths. What is his total score in Maths and English?

- Ans.** Marks scores in English =  $x$   
 Marks scores in maths = 70  
 Total score in maths and English =  $x + 70$

## Exercise-8.2

1. If  $p = -1$ ,  $q = 2$  find the value of :

**Ans.** Substituting  $p = -1$ ,  $q = 2$  in the expression we get :

- (a)  $p + q = -1 + 2 = 1$  (b)  $pq + q^2 - 3 = -1 \times 2 + (2)^2 - 3$   
 $= -2 + 4 - 3 = 4 - 5 = -1$   
 (c)  $p^3 - q^3 = (-1)^3 - (2)^3$  (d)  $3p + q - pq = 3 \times (-1) + 2 - ((-1) \times 2)$   
 $= -1 - 8 = -9$   $= -3 + 2 - (-2) = -3 + 4 = 1$   
 (e)  $5p^2 - 2pq$  (f)  $pq - p^2 = (-1)(2) - (-1)$   
 $= 5(-1)^2 - 2(-1 \times 2)$   $= -2 - 1$   
 $= 5 \times 1 - 2 \times -2 = 5 + 4 = 9$   $= -3$

2. If  $x = 1$ ,  $y = 2$  and  $z = 0$  find the value of :

**Ans.** Substituting  $x = 1$ ,  $y = 2$  and  $z = 0$  in the expression. we get :

- (a)  $x^3 + y^3 + z^3 = (1)^3 + (2)^3 + (0)^3$  (b)  $2x^2y - 3xyz = 2(1)^2 \times 2 - 3 \times 1 \times 2 \times 0$   
 $= 1 + 8 + 0$   $= 2 \times 1 \times 2 - 0$   
 $= 9$   $= 4 - 0 = 4$   
 (c)  $x^2 + xy + yz - 6 = (1)^2 + (2 \times 1) + (2 \times 0) - 6$   
 $= 1 + 2 + 0 - 6 = 3 - 6 = -3$

3. If  $x = 7$ ,  $y = 6$  and  $z = 4$ , find the value of  $3x + (2y \times z)$ .

**Ans.** Substituting the values of  $x = 7$ ,  $y = 6$ ,  $z = 4$  in the given expressions, we get

$$3x + (2y \times z) = 3 \times 7 + (2 \times 6 \times 4) = 21 + (12 \times 4) = 21 + 48 = 69$$

4. Find the value of the following expressions for the given values of variables :

- Ans.** (a) Substituting the values of  $x = 1$  and  $y = 2$  in expression  $x^2y + x^2y^2 - xy^2$ .  
 $(1)^2 \times 2 + (1)^2(2)^2 - 1 \times (2)^2 = 1 \times 2 + 1 \times 4 - 1 \times 4 = 2 + 4 - 4 = 6 - 4 = 2$   
 (b) Substituting the values of  $a = 2$ ,  $b = 3$  and  $c = 5$  in expression  $4a - 3b + c$ .  
 $= 4 \times 2 - 3 \times 3 + 5 = 8 - 9 + 5 = 13 - 9 = 4$   
 (c) Substituting the values of  $a = 0$ ,  $b = 1$ ,  $c = 1$  in expression  $a^2 - 2b^2 + 3c^2$   
 $= (0)^2 - 2(1)^2 + 3(1)^2$   
 $= 0 - 2 + 3 = 3 - 2 = 1$   
 (d) Substituting the values of  $x = 1$ ,  $y = -2$  and  $z = 3$  in expression  $x^2 - y^2 - z^2$   
 $= (1)^2 - (-2)^2 - (3)^2$   
 $= 1 - 4 - 9 = 1 - 13 = -12$   
 (e) Substituting the values of  $x = -1$ ,  $y = 2$  and  $z = 1$  in expression  $4xyz - 2xy + 3xyz$   
 $= 4(-1) \times (2) \times (1) - (2(-1)(2)) + 3(-1)(2)(1)$

$$= -8 - (-4) + (-6)$$

$$= -8 + 4 - 6 = -8 - 6 + 4 = -14 + 4 = -10$$

(f) Substituting the values of  $x = 3$ , and  $a = 5$  in expression  $5 + 4x^3 - 4x + 2a$

$$= 5 + 4(3)^3 - 4 \times 3 + 2 \times 5 = 5 + 4 \times 27 - 12 + 10$$

$$= 5 + 108 - 12 + 10 = 123 - 12 = 111$$

### I. MCQs : Choose the correct option :

1. (c)    2. (a)    3. (c)    4. (b)    5. (a)    6. (c)    7. (d)    8. (b)

### II. Fill in the blanks :

- Ans. 1. **Al-khwarizmi** is known as the father of algebra.  
 2. An algebraic expression containing two terms is called a **binomial**.  
 3. In  $3xy$ ,  $x$  and  $y$  are called the **literal numbers or variables**.  
 4. In  $3^5$ ,  $3$  is called **base**.  
 5. The coefficient of  $x^2$  in  $-5x^2y$  is  **$-5y$** .

### III. State True (T)/False (F) :

1. T    2. T    3. F    4. F

### Mental Maths

1. Jatin asked his friends Rashmi, Jyoti and Pawan to think of a number and told them to add 50 to it. Then he asked them to double it. Next he asked them to add 48 to the answer. Then he told them to divide it by 2 and subsequently subtract the number that they had thought of. Jatin said that the answer would now be 74 for all of them. Rashmi had thought of 16, Jyoti had thought of 22, and Pawan had thought of 7. You check it out.

		Rashmi	Jyoti	Pawan
Think of a number	$x$	16	22	7
add 50	$x + 50$	<b>66</b>	<b>72</b>	<b>57</b>
double it	$2x + 100$	<b>132</b>	<b>144</b>	<b>114</b>
add 48	$2x + 148$	<b>180</b>	<b>192</b>	<b>162</b>
divide by 2	$x + 74$	<b>90</b>	<b>96</b>	<b>81</b>
take away the number you thought of	74	<b>74</b>	<b>74</b>	<b>74</b>

2. Try this one.

	Rashmi	Jyoti	Pawan	You
Think of a number	$x$	10	12	20
add 47	$x + 47$	<b>57</b>	<b>59</b>	<b>67</b>
double it	$2x + 94$	<b>114</b>	<b>113</b>	<b>134</b>
take away 75	$2x + 19$	<b>39</b>	<b>43</b>	<b>59</b>
triple it	$6x + 57$	<b>117</b>	<b>129</b>	<b>177</b>
subtract the number you thought of	$5x + 57$	<b>107</b>	<b>117</b>	<b>157</b>
add 18	$5x + 75$	<b>125</b>	<b>135</b>	<b>175</b>
divide by 5	$x + 15$	<b>25</b>	<b>27</b>	<b>35</b>
take away the number you thought of	15	<b>15</b>	<b>15</b>	<b>15</b>





# Linear Equation in One Variable

# 9

## Exercise-9.1

1. Write each of the following statements as an equation :

- Ans.** (a)  $2x = x + 3$       (b)  $5x - 5 = 10$       (c)  $\frac{x}{3} = 6$       (d)  $17 - x = 8$   
 (e)  $8x = 40$       (f)  $x + 7 = 12$       (g)  $2x - 5 = 15$       (h)  $x - 10 = 15$   
 (i)  $25 - 2x = 10$       (j)  $3x + \frac{x}{3} = 15$

2. Write a statement for each of the following equations :

- Ans.** (a) A number increased by 7 is 10      (b) 3 exceeds a number by 7  
 (c) A number exceeds 7 by 5      (d) A number divided by 5 gives 7  
 (e) 4 is added to twice a number gives 10      (f) A number increased by 11 gives 17

3. Solve each of the following equation by trial-and-error method :

- Ans.** (a) We try several values of  $x$  and find L.H.S. and R.H.S. value. When L.H.S. = R.H.S. for particular value of  $x$   
 Equation  $x + 5 = 8$

$x$	L.H.S.	R.H.S.
1	$1 + 5 = 6$	8
2	$2 + 5 = 7$	8
3	$3 + 5 = 8$	8

Value of  $x = 3$

- (b) We try several values of  $x$  and find L.H.S. and R.H.S. value. When L.H.S. = R.H.S. for particular value of  $x$ , then when stop.  
 Equation  $x - 3 = 7$

$x$	L.H.S.	R.H.S.
1	$1 - 3 = -2$	7
2	$2 - 3 = -1$	7
3	$3 - 3 = 0$	7
4	$4 - 3 = 1$	7
5	$5 - 3 = 2$	7
6	$6 - 3 = 3$	7
7	$7 - 3 = 4$	7
8	$8 - 3 = 5$	7
9	$9 - 3 = 6$	7
10	$10 - 3 = 7$	7

Value of  $x = 10$

- (c) We try several values of  $x$  and find the values of L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular value of  $x$ , then we stop :

Equation  $3x = 9$

$x$	L.H.S.	R.H.S.
1	$3 \times 1 = 3$	9
2	$3 \times 2 = 6$	9
3	$3 \times 3 = 9$	9

Value of  $x = 3$

- (d) We try several values of  $x$  and find the value of L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular value of  $x$ , then we stop :

Equation  $x + 7 = 7$

$x$	L.H.S.	R.H.S.
0	$0 + 7 = 7$	7

Value of  $x = 0$

- (e) We try several values of  $x$  and find the value of L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular value of  $x$ , then we stop

Equation  $\frac{x}{2} = 3$

$x$	L.H.S.	R.H.S.
1	$\frac{1}{2} = 0.5$	3
2	$\frac{2}{2} = 1$	3
3	$\frac{3}{2} = 1.5$	3
4	$\frac{4}{2} = 2$	3
5	$\frac{5}{2} = 2.5$	3
6	$\frac{6}{2} = 3$	3

Value of  $x = 6$

- (f) We try several values of  $x$  and find the values of the L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular value of  $x$ , then we stop :

$2x + 4 = 3x$

$x$	L.H.S.	R.H.S.
1	$2 \times 1 + 4 = 2 + 4 = 6$	$3 \times 1 = 3$
2	$2 \times 2 + 4 = 4 + 4 = 8$	$3 \times 2 = 6$
3	$2 \times 3 + 4 = 6 + 4 = 10$	$3 \times 3 = 9$
4	$2 \times 4 + 4 = 8 + 4 = 12$	$3 \times 4 = 12$

Value of  $x = 4$

- (g) We try several values of  $x$  and find the values of the L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular value of  $x$ . Then, we stop equation  $10 - x = 6$ .

$x$	L.H.S.	R.H.S.
1	$10 - 1 = 9$	6
2	$10 - 2 = 8$	6
3	$10 - 3 = 7$	6
4	$10 - 4 = 6$	6

Value of  $x = 4$

- (h) We try several values of  $x$  and find the value of the L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular of  $x$ , then we stop equation  $x - 4 = 2x - 6$  particular of  $x$  then we stop equation  $x - 4 = 2x - 6$ .

$x$	L.H.S.	R.H.S.
1	$1 - 4 = -3$	$2 \times 1 - 6 = 2 - 6 = -4$
2	$2 - 4 = -2$	$2 \times 2 - 6 = 4 - 6 = 2$

Value of  $x = 2$

- (i) We try several values  $x$  and find the value of the L.H.S. and R.H.S. when L.H.S. = R.H.S. for a particular of  $x$ . Then, we stop equation  $2x + 3 = 3x$ .

$x$	L.H.S.	R.H.S.
1	$2 \times 1 + 3 = 5$	$3 \times 1 = 3$
2	$2 \times 2 + 3 = 7$	$2 \times 2 = 4$
3	$2 \times 3 + 3 = 9$	$3 \times 3 = 9$

Value of  $x = 3$

4. Verify by substitution that the root of  $3 + 2x = 9$  is  $x = 3$ .

**Ans.** Equation  $3 + 2x = 9$

Value of  $x = 3$  put in equation  $3 + 2 \times 3 = 3 + 6 = 9$

L.H.S. = R.H.S.

5. Verify by substitution that the root of  $5x - 8 = 2x - 2$  is  $x = 2$ .

**Ans.** Equation  $5x - 8 = 2x - 2$

Value of  $x = 2$ , put in equation

L.H.S. =  $5 \times 2 - 8 = 10 - 8 = 2$

R.H.S. =  $2 \times 2 - 2 = 4 - 2 = 2$

L.H.S. = R.H.S.

## Exercise-9.2

1. Solve the following equation and verify the result in each case :

**Ans.** (a)  $x + 2 = 7$

$$x = 7 - 2 = 5$$

$$x = 5$$

**Verification :** Submitting  $x = 5$  in the given equation

$$\text{L.H.S.} = 5 + 2 = 7$$

$$\text{R.H.S.} = 7$$

$$\text{L.H.S.} = \text{R.H.S.}$$



$$\begin{aligned} \text{(b)} \quad x + 5 &= -7 \\ x &= -7 - 5 = -12 \\ x &= -12 \end{aligned}$$

**Verification :** Submitting  $x = -12$  in the given equation

$$\begin{aligned} \text{L.H.S.} &= -12 + 5 = -7 \\ \text{R.H.S.} &= -7 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(c)} \quad 3 - x &= 1 \\ -x &= 1 - 3 \\ -x &= -2 \\ \text{or } x &= 2 \end{aligned}$$

**Verification :** Submitting  $x = 2$  in the given equation we get

$$\begin{aligned} \text{L.H.S.} &= 3 - 2 = 1 \\ \text{R.H.S.} &= 1 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(d)} \quad x - 2 &= -5 \\ x &= -5 + 2 = -3 \\ x &= -3 \end{aligned}$$

**Verification :** Submitting  $x = -3$  in the given equation we get

$$\begin{aligned} \text{L.H.S.} &= -3 - 2 = -5 \\ \text{R.H.S.} &= -5 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(e)} \quad 3x - 3 &= 12 \\ 3x &= 12 + 3 \\ 3x &= 15 \\ x &= \frac{15}{3} = 5 \\ x &= 5 \end{aligned}$$

**Verification :** Submitting  $x = 5$  in the given equation we get

$$\begin{aligned} \text{L.H.S.} &= 3 \times 5 - 3 = 15 - 3 = 12 \\ \text{R.H.S.} &= 12 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(f)} \quad 4x - 4 &= 16 \\ 4x - 4 &= 16 \\ 4x &= 16 + 4 \\ 4x &= 20 \\ x &= \frac{20}{4} = 5 \\ x &= 5 \end{aligned}$$

**Verification :** Submitting  $x = 5$  in the given equation we get

$$\begin{aligned} \text{L.H.S.} &= 4 \times 5 - 4 = 20 - 4 = 16 \\ \text{R.H.S.} &= 16 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(g)} \quad \frac{3x}{5} &= 18 \\ 3x &= 18 \times 5 \\ 3x &= 90 \\ x &= \frac{90}{3} = 30 \\ x &= 30 \end{aligned}$$

**Verification :** Submitting  $x = 30$  in the given equation we get

$$\begin{aligned} \text{L.H.S.} &= \frac{3 \times 30}{5} = 18 \\ \text{R.H.S.} &= 18 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(h)} \quad 6x - 5 &= 2x + 11 \\ 6x - 5 &= 2x + 11 \\ 6x - 2x &= 11 + 5 \\ 4x &= 16 \\ x &= 16 \div 4 = 4 \\ x &= 4 \end{aligned}$$

**Verification :** Submitting  $x = 4$  in the given equation

$$\begin{aligned} \text{L.H.S.} &= 6 \times 4 - 5 = 24 - 5 = 19 \\ \text{R.H.S.} &= 2 \times 4 + 11 = 8 + 11 = 19 \\ \text{L.H.S.} &= \text{R.H.S.} \end{aligned}$$

$$\begin{aligned} \text{(i)} \quad \frac{x}{2} = \frac{x}{3} + 5 & \Rightarrow \frac{x}{2} = \frac{x + 5 \times 3}{3} & \Rightarrow \frac{x}{2} = \frac{x + 15}{3} \\ 3x = 2(x + 15) & \Rightarrow 3x = 2x + 30 & \Rightarrow 3x - 2x = 30 \\ 3x - 2x = 30 & \Rightarrow x = 30 \end{aligned}$$

**Verification :**

$$\frac{30}{2} = \frac{30}{3} + 5 \quad \Rightarrow \quad 15 = 30 + 5 \times 3$$

$$15 = \frac{30+15}{3} \quad \Rightarrow \quad 15 = \frac{45}{3} = 15$$

L.H.S. = R.H.S.

2. Solve the following :

**Ans.** (a)  $3(x+2) - 2(x-3) = 5$

$$3x + 6 - 2x + 6 = 5$$

$$3x - 2x + 6 + 6 = 5$$

$$x + 12 = 5$$

$$x = 5 - 12$$

$$x = -7$$

(c)  $\frac{3y}{10} - 4 = 11$

$$\frac{3y - 4 \times 10}{10} = 11$$

$$3y - 40 = 110$$

$$3y - 40 = 110$$

$$3y = 110 + 40$$

$$3y = 150$$

$$y = \frac{150}{3} = 50, y = 50$$

(e)  $3(x+6) + 2(x+3) = 54$

$$3x + 18 + 2x + 6 = 54$$

$$5x + 18 + 6 = 54$$

$$5x + 24 = 54$$

$$5x = 54 - 24$$

$$5x = 30$$

$$x = \frac{30}{5} = 6, x = 6$$

(g)  $6x + 5 = 3x + 20$

$$6x - 3x = 20 - 5$$

$$3x = 15$$

$$x = \frac{15}{3} = 5$$

$$x = 5$$

(i)  $2(x-2) - 3(x-3) = 5(x-5)$

$$2x - 4 - 3x + 9 = 5x - 25$$

$$-x + 5 = 5x - 25$$

$$5x + x = 25 + 5$$

$$6x = 30$$

$$x = \frac{30}{6} = 5$$

(b)  $\frac{m}{4} - \frac{1}{2} = \frac{m}{3} + 1$

$$\frac{m-2}{4} = \frac{m+3}{3}$$

$$(m-2)3 = (m+3)4$$

$$3m - 6 = 4m + 12$$

$$-6 - 12 = 4m - 3m$$

$$-18 = 1m, \Rightarrow m = -18$$

(d)  $\frac{2x}{3} + 8 = \frac{x}{2} - 1$

$$\frac{2x+24}{3} = \frac{x-2}{2}$$

$$2(2x+24) = 3(x-2)$$

$$4x + 48 = 3x - 6$$

$$4x - 3x = -6 - 48$$

$$x = -54$$

$$x = -54$$

(f)  $\frac{m}{4} + 8 = 12$

$$\frac{m+8 \times 4}{4} = 12$$

$$m + 32 = 12 \times 4$$

$$m = 48 - 32 = 16$$

$$m = 16$$

(h)  $12m - 3 = 5(2m + 1)$

$$12m - 3 = 10m + 5$$

$$12m - 10m = 5 + 3$$

$$2m = 8$$

$$m = 4$$



3. Solve each of following equation and verify answer :

Ans. (a)  $3(2-5x)-2(1-6x)=1$

$$(6-15x)-(2-12x)=1$$

$$6-15x-2+12x=1$$

$$6-2-15x+12x=1$$

$$4-3x=1$$

$$-3x=1-4$$

$$-3x=-3$$

$$x = \frac{-3}{-3} \text{ or } x = 1$$

**Verification :** Value  $x$  put in equation L.H.S.

$$= 3(2-5 \times 1) - 2(1-6 \times 1)$$

$$= 3(2-5) - 2(1-6)$$

$$= 3 \times -3 - 2 \times (-5)$$

$$= -9 + 10 = 1$$

$$\text{R.H.S.} = 1$$

$$\text{L.H.S.} = \text{R.H.S.}$$

(c)  $\frac{2m}{3} + 8 = \frac{m}{2} - 1$

$$\frac{2m+3 \times 8}{3} = \frac{m-1 \times 2}{2}$$

$$\frac{2m+24}{3} = \frac{m-2}{2}$$

$$2(2m+24) = 3(m-2)$$

$$4m+48 = 3m-6$$

$$4m-3m = -6-48$$

$$m = -54$$

**Verification :** Value of  $m$  put in equation

$$\text{L.H.S.} = \frac{2 \times -54}{3} + 8 = -36 + 8 = -28$$

$$\text{R.H.S.} = \frac{-54}{2} - 1 = \frac{-54-2}{2} = \frac{-56}{2} = -28$$

$$\text{L.H.S.} = \text{R.H.S.}$$

(e)  $\frac{x-3}{5} - 2 = \frac{2x}{5}$

$$\frac{x-3-2 \times 5}{5} = \frac{2x}{5}$$

(b)  $\frac{n}{4} - 5 = \frac{n}{6} + \frac{1}{2}$

$$\frac{n-20}{4} = \frac{n+3 \times 1}{6}$$

$$\frac{n-20}{4} = \frac{n+3}{6}$$

$$6(n-20) = 4(n+3)$$

$$6n-120 = 4n+12$$

$$6n-4n = 120+12$$

$$2n = 132$$

$$n = \frac{132}{2} = 66, n = 66$$

**Verification :** Value  $n$  put in equation L.H.S.

$$\frac{66}{4} - 5 = \frac{66-20}{4} = \frac{46}{4} = \frac{23}{2}$$

$$\text{R.H.S.} = \frac{66}{6} + \frac{1}{2} = \frac{22+1}{2} = \frac{23}{2}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

(d)  $\frac{2x}{5} - \frac{3}{2} = \frac{x}{2} + 1$

$$\frac{2 \times 2x - 3 \times 5}{5 \times 2} = \frac{x+2}{2}$$

$$\frac{4x-15}{10} = \frac{x+2}{2}$$

$$2(4x-15) = 10(x+2)$$

$$8x-30 = 10x+20$$

$$-30-20 = 10x-8x$$

$$-50 = 2x, x = \frac{-50}{2} = -25, x = -25$$

**Verification :** Value of  $x$  put in equation

$$\text{L.H.S.} = \frac{2 \times -25}{5} - \frac{3}{2} = \frac{-50}{5} - \frac{3}{2}$$

$$= \frac{-50 \times 2 - 3 \times 5}{10}$$

$$= \frac{-100-15}{10} = \frac{-115}{10} \text{ or } \frac{-23}{2}$$

$$\text{R.H.S.} = \frac{-25}{2} + 1 = \frac{-25+2}{2} = \frac{-23}{2}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

(f)  $\frac{3x}{10} - 4 = 14$

$$\frac{3x-40}{10} = 14$$

$$(x-3-10)5 = 2x \times 5$$

$$(x-13) \times 5 = 10x$$

$$5x - 65 = 10x$$

$$10x - 5x = -65$$

$$5x = -65$$

$$x = \frac{-65}{5}, x = -13$$

**Verification :** Value of  $x$  put in equation

$$\text{L.H.S.} = \frac{-13-3}{5} - 2 = \frac{-16}{5} - 2$$

$$= \frac{-16-10}{5} = \frac{-26}{5}$$

$$\text{R.H.S.} = -13 \times \frac{2}{5} = \frac{-26}{5}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

$$3x - 40 = 140$$

$$3x = 14 + 40$$

$$3x = 180$$

$$x = \frac{180}{3} = 60$$

$$x = 60$$

**Verification :**  $x$  value put in equation.

$$\text{L.H.S.} = \frac{3 \times 60}{10} - 4$$

$$= \frac{180}{10} - 4 = 18 - 4 = 14$$

$$\text{R.H.S.} = 14$$

$$\text{L.H.S.} = \text{R.H.S.}$$



## Exercise-9.3

1. Find a number which when multiplied by 5 becomes 100.

**Ans.** Let a number be  $x$

$$\text{Multiply by } 5 = 5x$$

According to question multiplied by :

$$5 = 100$$

$$5x = 100$$

$$x = 100 \div 5 = 20$$

Thus, number is 20.

2. The sum of three consecutive natural numbers is 114. Find the numbers.

**Ans.** Let first number be  $x$ , next two number =  $(x+1), (x+2)$

Sum of three consecutive natural number = 114

$$x + (x+1)(x+2) = 114$$

$$3x + 3 = 114$$

$$3x = 114 - 3$$

$$x = \frac{111}{3} = 37$$

First number = 37, second =  $37 + 1 = 38$ , third number =  $38 + 1 = 39$ .

3. If a number is tripled and the result is increased by 5, we get 50. Find the number.

**Ans.** Let a number be  $x$

Number tripled =  $3x$

Increased by = 5

Then number =  $3x + 5$

According to question, a number is tripled and increase by 5 we get 50

$$3x + 5 = 50$$

$$3x = 50 - 5$$

$$x = 45 \div 3$$

$$x = 15$$

Thus number is 15.



4. Find two numbers such that one of them exceeds the other by 18 and their sum is 92.

**Ans.** Let one number =  $x$

Other number =  $x + 18$

sum of both number =  $x + x + 18 = 2x + 18$

According to question; sum of both number = 92

$$2x + 18 = 92$$

$$2x = 92 - 18$$

$$2x = 74$$

$$x = 74 \div 2 = 37$$

One number is 37 and other number  $37 + 18 = 55$

5. Jenny is 6 years older than her brother Ajay. If the sum of their ages is 28 years, what are their present ages?

**Ans.** Let Ajay's age =  $x$  years

Jenny's age = 6 years

Sum of both age =  $x + 6$

According to question

sum of their age = 28

$$x + x + 6 = 28$$

$$2x + 6 = 28$$

$$2x = 28 - 6$$

$$2x = 22$$

$$x = \frac{22}{2} = 11$$

Ajay's age 11 year and Jenny's age 17 year.

6. The length of a rectangular park is thrice its breadth. If the perimeter of the park is 168 metres, find its dimensions.

**Ans.** Let breadth of rectangular park =  $x$

Length of rectangular park =  $3x$

Perimeter of rectangular park  $(x + 3x) 2$

According to question ;

$$(3x + x) 2 = 168$$

$$4x \times 2 = 168$$

$$8x = 168$$

$$x = 168 \div 8 = 21$$

Breadth of rectangular park = 21 cm

Length of rectangular park =  $21 \times 3 = 63$  cm.

7. The length of a rectangular hall is 5 metres more than its breadth. If the perimeter of the hall is 74 metres, find its length and breadth.

**Ans.** Breadth of rectangular hall =  $x$  m

Length of rectangular hall =  $(x + 5)$  m

Perimeter of hall = 74 m

$$2(x + (x + 5)) = 74 \text{ m}$$

$$2(2x + 5) = 74 \text{ m}$$

$$4x + 10 = 74 \text{ m}$$

$$4x = 64 \text{ m}$$



$$x = 64 \div 4 = 16 \text{ m}$$

$$\text{Length of rectangular hall} = 16 + 5 = 21 \text{ m}$$

$$\text{Breadth of rectangular hall} = 16 \text{ m}$$

8. A wire of length 86 cm is bent in the form of a rectangle such that its length is 7 cm more than its breadth. Find the length and breadth of the rectangle so formed.

**Ans.** Breadth of rectangular =  $x$

$$\text{Length of rectangular formed} = x + 7$$

$$\text{Length of a wire} = 86 \text{ cm}$$

$$2(x + (x + 7)) = 86$$

$$2 \times (2x + 7) = 86$$

$$4x + 14 = 86$$

$$4x = 86 - 14$$

$$4x = 72$$

$$x = \frac{72}{4} = 18$$

$$x = 18$$

$$\text{Breadth of rectangle} = 18 \text{ m}$$

$$\text{Length of rectangle} = 25 \text{ m}$$

9. When Ravi multiplies a certain number by 17 and adds 4 to the product, he gets 225. Find that number.

**Ans.** Let, Ravi take number =  $x$

$$\text{Multiply by 17} = x \times 17$$

$$\text{added to 4} = 17x + 4$$

$$\text{He will get} = 225$$

Now,

$$17x + 4 = 225$$

$$17x = 225 - 4$$

$$17x = 221$$

$$x = \frac{221}{17} = 13$$

This, Ravi take number is 13.

10. Raghav is twice as old as his brother Vikas. If the difference of their ages be 11 year, find their present ages.

**Ans.**

$$\text{Vikas's age} = x \text{ year}$$

$$\text{Raghav's age} = 2x \text{ year}$$

$$\text{Difference} = (2x - x) \text{ year}$$

$$\text{According to question; } (2x - x) = 11 \text{ year}$$

$$x = 11 \text{ year}$$

$$\text{Vikas's age} = 11 \text{ year}$$

$$\text{Raghav's age} = 11 \times 2 = 22 \text{ year}$$

11. A man is 4 times as old as his son. After 16 years he will be only twice old as his son. Find their present ages.

**Ans.** Let a son's age =  $x$

$$\text{Let a men's age} = 4x$$

$$\text{After 16 year ages.}$$

$$\text{Son's age} = (x + 16)$$

$$\text{Father's age} = (4x + 16)$$

$$\text{According to question; } \text{father age} = 2 \times \text{son's age}$$

$$4x + 16 = 2(x + 16)$$

$$4x + 16 = 2x + 32$$

$$4x - 2x = 32 - 16$$

$$x = 16 \div 2$$

$$x = 8$$

Son's age = 8 year

Father's age =  $8 \times 4 = 32$  year.

12. A man is thrice as old as his son. Three years ago the man was four times as old as his son. Find their present ages.

Ans.

Son's age =  $x$  year

Father's age =  $3 \times x = 3x$  year

After 3 years; son's age =  $x + 3$  year

Father's age =  $3x + 3$  year

According to question;  $3x + 3 = 4(x + 3)$

$$3x + 3 = 4x + 12$$

$$4x - 3x = 12 - 3$$

$$x = 9$$

Thus Son's age = 9 year

Father's age =  $9 \times 3 = 27$  year

13. Mrs Verma is 27 years older than her daughter Rekha. After 8 years she will be twice as old as Rekha. Find their present ages.

Ans.

Let Rekha's age =  $x$  year

Mrs. Verma =  $(x + 27)$  year

After 8 year, Rekha's age =  $(x + 8)$  year

Mrs. Verma age =  $x + 35$  year

=  $(x + 27 + 8)$  year

According to question,  $x + 35 = (x + 8)2$

$$x + 35 = 2x + 16$$

$$2x - x = 35 - 16$$

$$2x - x = 35 - 16$$

$$x = 19$$

Rekha's age = 19 year and  $x = 19$

Mrs. Verma age =  $19 + 27 = 46$  year

14. A bag contains 25-paisa and 50-paisa coins whose total value is ₹ 30. If the number of 25-paisa coins is four times that of 50-paisa coins, find the number of each type of coins.

Ans. Let 50 paisa coins =  $x$  then 25 paisa coins =  $4x$

According to questions their total value = 300

or  $30 \times 100$  paisa = 3000 paisa (₹ 1 = 100 paisa)

Now  $50 \times x + 25 \times 4x = 3000$

$$50x + 100x = 3000$$

$$150x = 3000$$

$$x = \frac{3000}{150}$$

$$x = 20$$

So, number of coins of 50-paisa = 20

and number of coins of 25-paisa =  $4 \times 20 = 80$

15. From the following figure, find the magnitude of each of the three angles formed :

Ans. We know that Straight line angle =  $180^\circ$

$$5x + 3 + x = 180^\circ$$

$$9x = 180$$

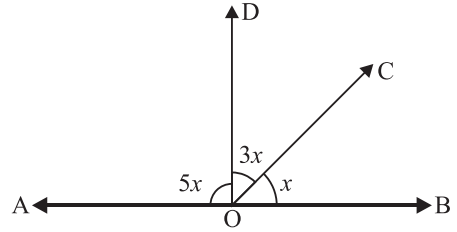
$$x = \frac{180}{9} = 20^\circ$$

$$x\text{'s value} = 20^\circ$$

$$\angle COB = x = 20^\circ$$

$$\angle DOC = 3x = 20 \times 3 = 60^\circ$$

$$\angle DOA = 5x = 20 \times 5 = 100^\circ$$



### I. MCQs : Choose the correct option :

1. (c), 2. (d), 4. (c), 5. (a)

### II. Fill in the blanks :

- If  $x + 3 = 7$ , then  $x = 7 - 3 = 4$ .
- If  $4x - 5 = 11 + 2x$ , then  $x = 8$ .
- The root of the equation  $3x + 7 = -14$  is  $-7$ .
- If the sum of three consecutive even numbers is 60, then the smallest of them is **18**.
- '3 less than twice a number  $x$  is 35' is translated into an equation as  $2x - 3 = 35$ .

### III. State True (T)/False (F) :

1. F, 2. T, 3. T, 4. F

### Mental Maths

1. Each equation in box A has a matching equivalent equation in box B. Find pairs of equation.

A	B
(a) $2x + 4 = 12$ $2x = 12 - 4$ $x = 8 \div 2$ $x = 4$	(i) $7 - x = 5$ $-x = 5 - 7$ $-x = -2$ $x = 2$
(b) $x + 3 = 4$ $x = 4 - 3$ $= 1$ $x = 1$	(ii) $-2 - x = -5$ $-x = -5 + 2$ $-x = -3$ $x = 3$
(c) $3x - 3 = 6$ $3x = 6 + 3$ $3x = 9$ $x = 9 \div 3 = 3$ $x = 3$	(iii) $3x - 1 = 11$ $3x = 11 + 1$ $3x = 12$ $x = 12 \div 3 = 4$ $x = 4$
(d) $8x - 2 = 14$ $8x = 14 + 2$ $x = 16 \div 8 = 2$ $x = 2$	(iv) $2x + 5 = 7$ $2x = 7 - 5$ $2x = 2$ $x = 2 \div 2 = 1$ $x = 1$

2. Find the value of  $x$  and  $y$  in the given figures :

**Ans.** (a) We know that in a square all the sides are equal

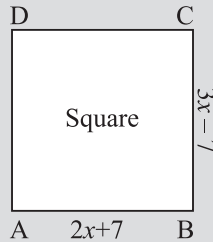
$$AB = BC = CD = AD$$

$$2x + 7 = 3x - 7$$

$$7 + 7 = 3x - 2x$$

$$14 = x$$

$$x = 14$$



(b) We know that in an equilateral triangle all the sides are equal.

$\therefore$

$$AB = BC = AC$$

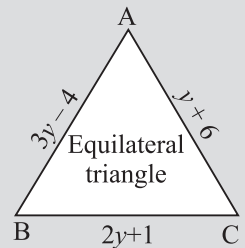
$$3y - 4 = 2y + 1 = y + 6$$

$$AB = BC$$

$$3y - 4 = 2y + 1$$

$$3y - 2y = 4 + 1$$

$$y = 5$$



Value of  $y$  is 5



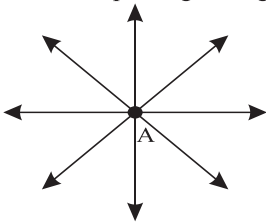
# Basic Geometrical Ideas

# 10



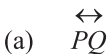
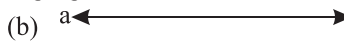
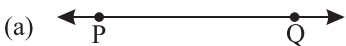
## Exercise-10.1

1. Mark a point  $A$  on a page of your notebook. Draw five lines passing through  $A$ . Can you draw more lines passing through  $A$ ?

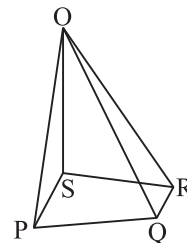
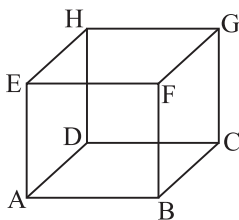


Yes, we can draw more lines through  $A$ .

2. Name the lines shown in each of the following figures :



3. In the fig. 10.20 given below, write the names of the points and lines :



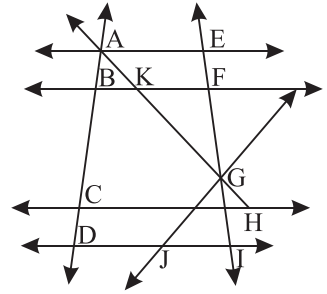
- (i) Points are  $A, B, C, D, E, F, G, H$   
 lines are  $AB, BC, CD, DA, EF, FG, GH, HE, AE, BF, CG, DH$
- (ii) Points are  $O, P, Q, R$  and  $S$   
 lines are  $PQ, QR, RS, SP, OP, OQ, OR$  and  $OS$ .

4. How many lines from the point P will pass through the point Q in fig. 10.20 (b)

Only one line can pass through  $P$  and  $Q$ .

5. Look at the figure 10.21 and name :

- (a)  $AE \parallel BF \parallel CH \parallel DI$ .  
 (b)  $AE$  and  $AD$ ;  $AG$  and  $GJ$ ;  $AE$  and  $EF$ ;  $BF$  and  $BC$ ,  $GI$  and  $DI$  are 5 pairs of inter-secting lines.  
 (c)  $JG$  and  $DI$  have point of intersection  $J$ .  
 (d)  $AG$  and  $BF$  have point of intersection  $K$ .



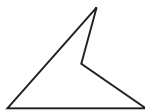
6. Consider the following figure of line PQ. State whether true or false for each statement:

- (a) true (b) true (c) true (d) false (e) false (f) false (g) true (h) false (i) false (j) false (k) true.

7. (a) Open figure (b) closed figure (c) closed figure (d) open figure.



(a)



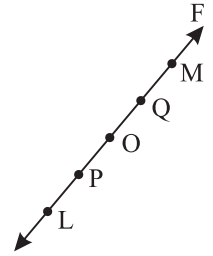
(b)



(c)



(d)

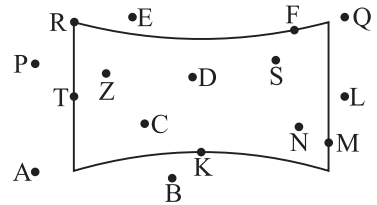


8. Name the points which are inside the figure, on the figure and outside the figure :

Point outside the figure =  $E, Q, L, B, A, P$

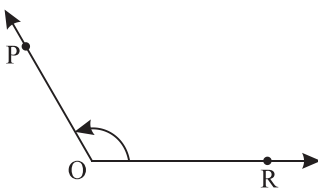
Point inside the figure =  $Z, D, S, C, N$

Points on the figure =  $R, F, M, K, T$



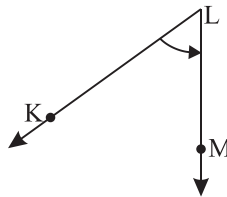
## Exercise-10.2

1. Name the following angles :



(a)

(a)  $\angle POR$



(b)

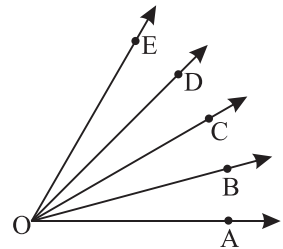
(b)  $\angle KLM$ .

2. Name all the possible angles that can be formed from this figure :

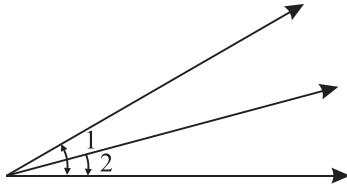
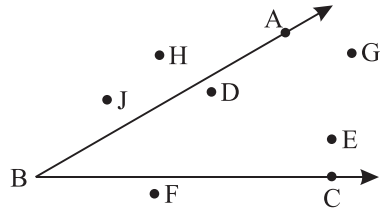
Angles are  $\angle EOD, \angle EOC, \angle EOB, \angle EOA$

$\angle DOC, \angle DOB, \angle DOA$

$\angle COB, \angle COA, \angle BOA$

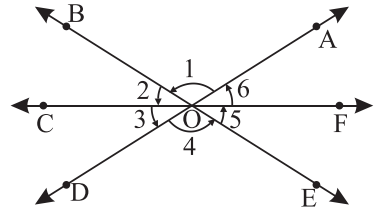


3. In the fig. 10.34, write down the points which are in the interior of  $\angle ABC$  and the points which are outside it.  
 Points in the interior of  $\angle ABC = D, G, E$   
 Points in outside of  $\angle ABC = H, J, F$
4. In this fig. 10.35, which is greater :  $\angle 1$  or  $\angle 2$ ?



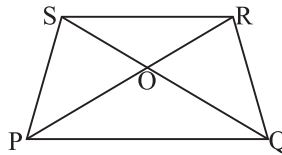
$$\angle 1 > \angle 2$$

5. In Fig. 10.36, write the other names of these angles :  
 $\angle 1 = \angle AOB$ ;  $\angle 2 = \angle BOC$   
 $\angle 3 = \angle COD$ ;  $\angle 4 = \angle DOE$   
 $\angle 5 = \angle EOF$ ;  $\angle 6 = \angle AOF$



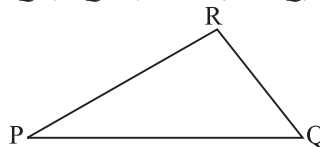
## Exercise-10.3

1. In the given figure, how many triangles are hidden. Name them.

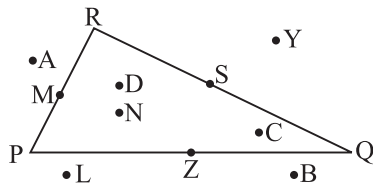


Triangles are  $\triangle POQ$ ,  $\triangle QOR$ ,  $\triangle ROS$ ,  $\triangle SOP$ ,  $\triangle PQR$ ,  $\triangle QRS$ ,  $\triangle RSP$ ,  $\triangle SPQ$ .

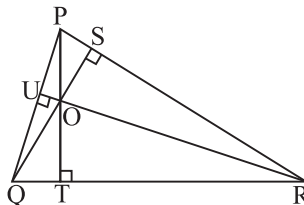
2. In  $\triangle PQR$  name :  
 (a) Side opposite to  $\angle P = PQ$ .  
 (b) Side opposite to  $\angle R = PQ$ .  
 (c) Angle opposite to side  $QR = \angle P$ .



3. State the points that lie :  
 (a) Points interior of  $\triangle PQR$  are  $D, N, C$ .  
 (b) Points on the  $\triangle PQR$  are  $M, S, Z$ .  
 (c) Points in the exterior of  $\triangle PQR$  are  $A, B, L$  and  $Y$ .



4. In the triangle shown below, name altitudes.



Altitudes are  $PT, RU, QS$ .



## Exercise-10.4

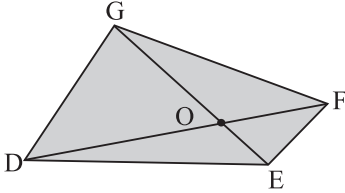
1. Fill in the blanks:

- A Quadrilateral has **4** sides and **2** diagonals.
- Two sides of a quadrilateral are said to be **adjacent** if they have a common end point.
- A quadrilateral has two pairs of opposite angles.
- A quadrilateral divides the plane of paper into **three** parts.

2. When do you say that a quadrilateral is convex?

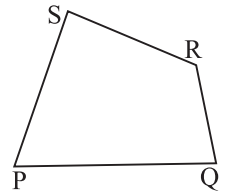
**Ans.** A Quadrilateral in which the measure of each angle is less than  $180^\circ$  is called a convex Quadrilateral.

3. Draw a quadrilateral  $DEFG$ . Shade the quadrilateral region. Also draw its diagonal. Let their point of intersection be  $O$ .



4. Look at quadrilateral  $PQRS$  and answer the following questions:

- 4-sides ; they are  $PQ, QR, RS$  and  $SP$ .
- 4-angles; they are  $\angle P, \angle Q, \angle R$  and  $\angle S$ .
- 4-vertices; they are  $P, Q, R$  and  $S$ .
- Adjacent sides are :  $(PQ, QR); (QR, RS); (RS, SP); (SP, PQ)$ .
- Opposite sides are  $(PQ, RS); (QR, SP)$ .
- Adjacent angles are  $(\angle P, \angle Q); (\angle Q, \angle R); (\angle R, \angle S)$  and  $(\angle S, \angle P)$ .
- Opposite angles are  $(\angle P, \angle R)$  and  $(\angle Q, \angle S)$ .
- 2 diagonals are  $PR$  and  $QS$ .
- No.



## Exercise-10.5

1. Draw a circle and answer the following.

**Ans.** Exterior of circle =  $B, F$

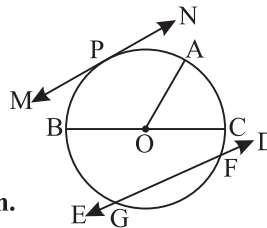
Interior of circle =  $CD$

Center =  $O$

Two points circle =  $A, F$

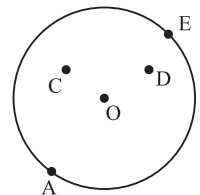
2. Observe Fig. 10.72 and fill in the blanks.

- Diameter of the circle is  $BC$ .
- $O$  is the **centre** of the circle.
- Tangent of the circle is  $MN$ .
- $ED$  is a **secant** of the circle.
- $OA$  is a radius of the circle.
- If length of  $OA$  is 3 cm, length of  $BC$  is **6 cm**.
- If  $BC$  is 10 cm long, length of  $OC$  is **5 cm**.
- $MN$  is a **tangent** of the circle.



3. Given below (Fig. 10.73) is a circle with centre  $O$ .

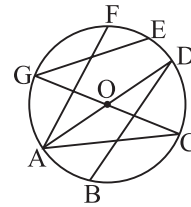
- $AF, GE$  are chords.



(b)  $\overline{AD}, \overline{GC}$  are two diameters.

(c)  $\overline{OD}$  and  $\overline{OC}$  are two radii.

(d)  $\overline{FGD}, \overline{DCB}$  are two arcs.



4. If the diameter of a circle is 14 cm, what will be its radius?

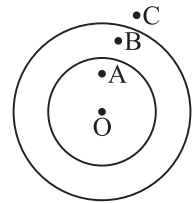
$$\therefore r = \frac{d}{2} = \frac{14}{2} \therefore \text{radius} = 7 \text{ cm}$$

5. Look at the figure 10.74 given below and use the words interior and exterior to fill up the blanks :

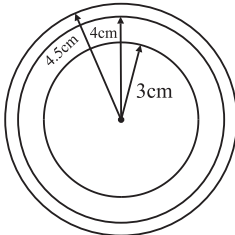
(a) Point A lies in the **interior** of both the circles.

(b) Point B lies in the **exterior** of the smaller circle and is in the **interior** of the bigger circle.

(c) Point C lies in the **exterior** of both the circles.



6. Mark a point O on a page of your notebook. With O as centre and radii 3 cm, 4 cm and 4.5 cm draw three concentric circles.



### I. MCQs : Choose the correct option :

Ans. 1. (a) 2. (a) 3. (d) 4. (b) 5. (b) 6. (a) 7. (c) 8. (b) 9. (b) 10. (c)

### II. Fill in the blanks :

- Ans. 1. A line has **no** end point.  
 2. A ray has **one** end points  
 3. A **quadri later** is a four-sided polygon.  
 4. The **diameter** is the longest chord in a circle  
 5. The angle between North and East is a **right angle**.  
 6. A **simple** curve does not cross itself.

### III. State True(T)/False (F)

Ans. 1. F 2. T 3. T 4. T 5. F

### HOTS

1. Find all the possible triangles shown in the fig. 10.75.

Ans. Number of triangles = 16

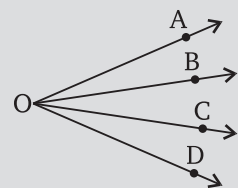
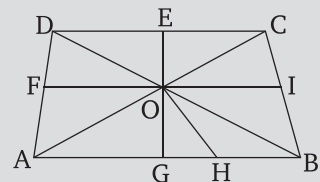
Name of triangle in the figure.

$\Delta AOG, \Delta GOH, \Delta HOB, \Delta BOI, \Delta IOC, \Delta COE, \Delta EOD, \Delta DOF,$   
 $\Delta FOA, \Delta AOD, \Delta OAG, \Delta AOB, \Delta BOC, \Delta BOC, \Delta COD, \Delta ADC, \Delta ABC.$

2. Name all possible angles in the following fig. 10.76

Ans. Name of all possible angles in the figure :

$\angle DOC, \angle COB, \angle BOA, \angle DOB, \angle COB, \angle DOA$







# Understanding Elementary Shapes

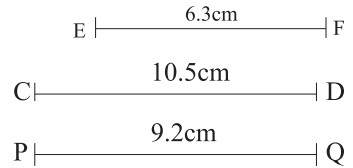
# 11



## Exercise-11.1

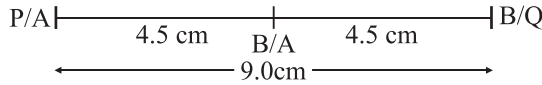
1. Draw the line segments.

- Ans.** (a) 6.3 cm  
 (b) 10.5 cm  
 (c) 9.2 cm

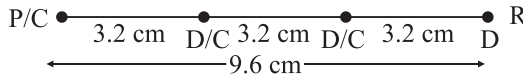


2. If  $AB = 4.5$  cm,  $CD = 3.2$  cm, construct a line segment whose length is equal to :

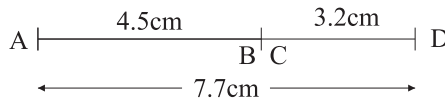
- Ans.** (a)  $PQ = AB \times 2 = 4.5 \times 2 = 9.0$  cm



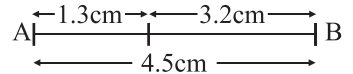
- (b)  $CD = 3.2$  cm,  $PR = 3 CD = 3 \times 3.2 = 9.6$  cm



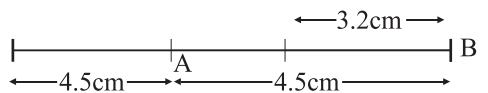
- (c)  $AB + CD \Rightarrow 4.5 + 3.2 = 7.7$  cm



- (d)  $AB - CD \Rightarrow 4.5 \text{ cm} - 3.2 \text{ cm} = 1.3$  cm



- (e)  $2AB - CD$   
 $2 \times 4.5 - 3.2$  cm  
 $9 - 3.2 = 5.8$  cm



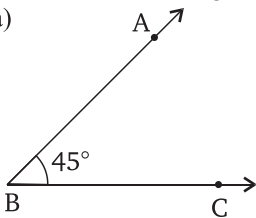
3. Compare the segments with the help of compass or divider and fill in the blanks using the symbol  $>$ ,  $=$ , or  $<$ .

- Ans.**  $AB = 3.8$ ,  $AD = 1.9$  cm,  $DC = 3.8$  cm,  $CB = 1.9$  cm,  $DB = 4.7$  cm,  $AC = 4.7$  cm.

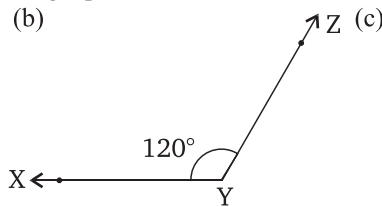
- (a)  $AB = CD$       (b)  $AB < BD$       (c)  $AC = BD$       (d)  $AC > AD$

4. Measure the following angles, using a protractor.

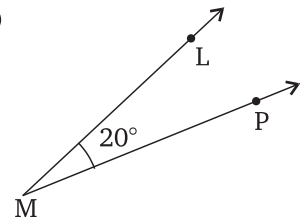
- Ans.** (a)

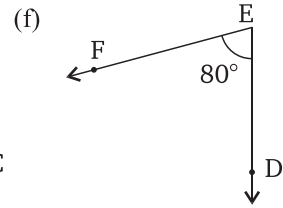
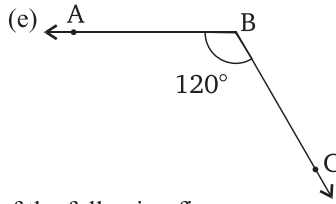
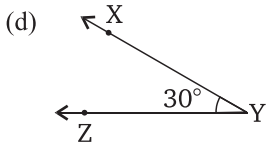


- (b)



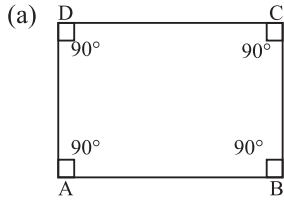
- (c)



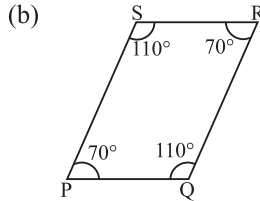


5. Measure all the angles of each of the following figures :

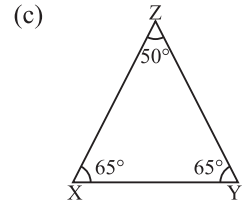
Ans.



$$\angle A = 90^\circ, \angle B = 90^\circ, \angle C = 90^\circ, \angle D = 90^\circ$$

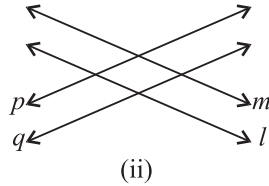
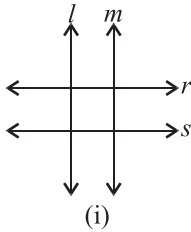


$$\angle P = 70^\circ, \angle Q = 110^\circ, \angle R = 70^\circ, \angle S = 110^\circ$$



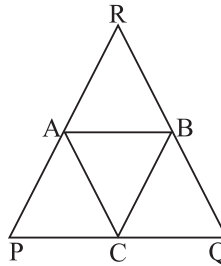
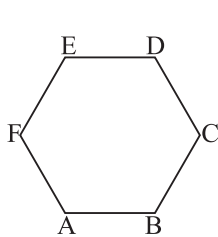
$$\angle X = 65^\circ, \angle Y = 65^\circ, \angle Z = 50^\circ$$

6. Write the pairs of parallel lines, perpendicular lines and intersecting lines :



- Ans. (a)  $(l, m), (r, s)$  — pairs of parallel lines;  
 $(l, r), (l, s), (m, r), (m, s)$  — pairs of perpendicular lines  
 (b)  $(l, p), (l, q), (m, p), (m, q)$  — pairs of intersecting lines  
 $(l, m), (p, q)$  — pairs of parallel line

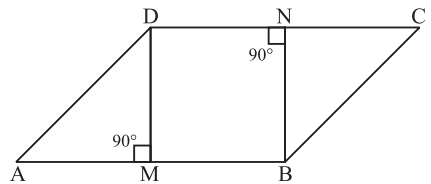
7. Write the pairs of parallel lines segments in the following figures :



- Ans. (a)  $(\overline{AB}, \overline{ED}), (\overline{BC}, \overline{EF}), (\overline{CD}, \overline{FA})$  — pairs of parallel lines segments  
 (b)  $(\overline{AB}, \overline{PQ}), (\overline{AC}, \overline{QR}), (\overline{BC}, \overline{PR})$  — pairs of parallel line segments

8. Write the pairs of perpendicular and parallel lines in figure :

- Ans.  $(\overline{AB}, \overline{DM}), (\overline{AB}, \overline{BN}), (\overline{DM}, \overline{DC}), (\overline{BN}, \overline{DC})$   
 pairs of perpendicular line segments.  
 $(\overline{DM}, \overline{NB}), (\overline{AB}, \overline{DC}), (\overline{BC}, \overline{AD})$   
 pairs of parallel line segments.



## Exercise-11.2

1. Identify the angles whose measures are given below, as acute, obtuse, right, zero, straight or reflex angles :

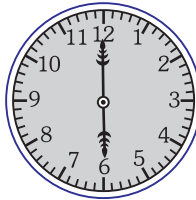
- Ans.** (a)  $45^\circ \Rightarrow$  acute angle                      (b)  $0^\circ \Rightarrow$  zero angle                      (c)  $180^\circ \Rightarrow$  straight angle  
 (d)  $270^\circ \Rightarrow$  reflex angle                      (e)  $135^\circ \Rightarrow$  obtuse angle                      (f)  $75^\circ \Rightarrow$  acute angle  
 (g)  $130^\circ \Rightarrow$  obtuse angle

2. Identify the angles between the two hands of a clock, at :

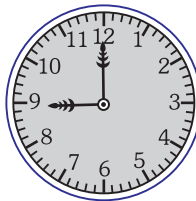
**Ans.**



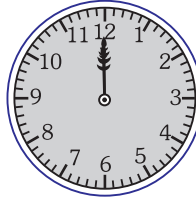
(a) 2 O'clock = acute angle



(b) 6 O'clock = straight angle



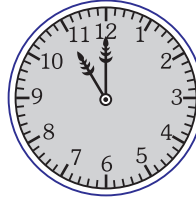
(c) 9 O'clock = right angle



(d) 12 noon = complete angle



(e) 5 O'clock = obtuse angle



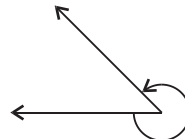
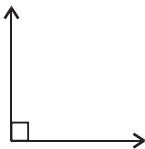
(f) 11 O'clock = acute angle



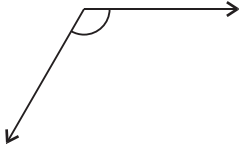
(g) 8 O'clock obtuse angle

3. Classify the following angles in acute, obtuse, right, straight or reflex angle :

- Ans.** (a) right angle                      (b) acute angle                      (c) reflex angle



(d) obtuse angle

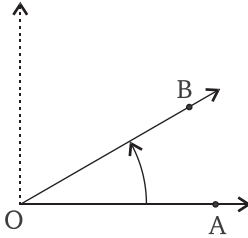


(e) straight angle

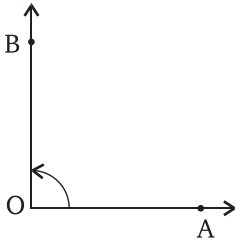


4. Using a pencil and a ruler, draw an acute angle, an obtuse angle, a right angle and a reflex angle. Measure each of them with the help of a protractor.

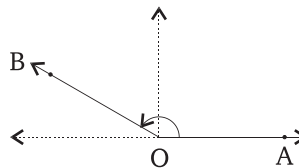
Ans. An Acute Angle



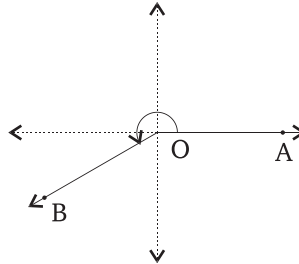
A right angle



An obtuse angle



A reflex angle



5. How many degrees are there in :

Ans. (a) one right angle =  $90^\circ$

(b) one straight angle =  $180^\circ$

(c) one complete angle =  $360^\circ$

6. A bicycle wheel has 48 spokes. Find the angle between a pair of adjacent spokes.

Ans. Number of spokes in bicycle wheel = 48

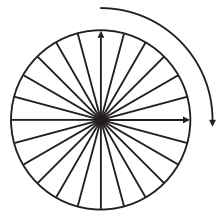
Complete angle =  $360^\circ$

The angle between a pair of adjacent spokes =  $360 \div 48 = 7\frac{1}{2}$

7. A bicycle wheel makes two and half turns. Find the number of right angles through which it turns.

Ans. One turn complete by 4 right angled

$4 + 4 + 2$  right angled = 10 right angle.



8. Give two examples each of a right, an acute and an obtuse angle from your environment.

Ans. Examples of a following angle

an obtuse angle—kite, redining chair.

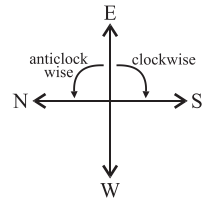
an right angle—book, door

an acute angle—icecream, table lamp.

9. You are standing in your class-room facing east. In what direction you are facing after making a quarter turn (a) clock-wise and (b) anticlockwise.

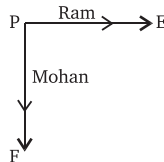
**Ans.** If we are starting east and make quarter to them clockwise, we will face **south** direction.

Similarly making a quarter then anticlockwise we will face **north** direction.



10. Ram and Mohan start from a point  $P$ . Ram moves towards east to  $E$  and Mohan moves towards south to  $F$ . Draw their paths and name the type of angle which will be formed between them.

**Ans.** A right angle



### Exercise-11.3

1. Name the following triangles in two different ways :

- Ans.** (a) Right angled triangle, isosceles triangle  
 (b) Acute angled triangle, equilateral triangle  
 (c) Obtuse angled triangle, scalene triangle  
 (d) Acute angled triangle, isosceles triangle

2. Classify the following triangles on the basis of their angles :

- Ans.** (a) Obtuse angled triangle (b) Right angled triangle  
 (c) Acute angled triangle (d) Obtuse angled triangle

3. Match the following :

- |   |                             |
|---|-----------------------------|
| <b>Ans.</b> Measure of the triangle           | Type of triangle            |
| (a) 3 equal sides                             | • equilateral triangle      |
| (b) 2 equal sides                             | • isosceles triangle        |
| (c) 3 acute angles                            | • acute-angled triangle     |
| (d) one right angle                           | • right-angled triangle     |
| (e) one obtuse angle with two equal sides     | • obtuse-isosceles triangle |
| (f) all acute angles with all different sides | • acute-scalene triangle    |

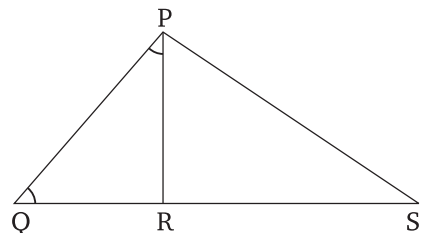
4. Find  $\angle PRQ$  in the given figure if  $\angle RPQ = \angle RQP = 45^\circ$ .

**Ans.**  $\triangle PQR$

$$\angle RPQ = \angle RQP = 45^\circ$$

$$\angle QRP = ?$$

$$\begin{aligned} \text{Sum of triangle's angle} &= 180^\circ \\ \angle RPQ + \angle RQP + \angle QRP &= 180^\circ \\ 45^\circ + 45^\circ + \angle QRP &= 180^\circ \\ 90^\circ + \angle QRP &= 180^\circ \\ \angle QRP &= 180^\circ - 90^\circ = 90^\circ \end{aligned}$$



5. The obtuse angle of the obtuse angled isosceles triangle is  $130^\circ$ . Find the other two angles.

**Ans.** In isosceles triangle one angle =  $130^\circ$

Let other same angle =  $x$

sum of triangles angle =  $180^\circ$   
 $x + 130^\circ = 180^\circ$   
 $x = 180^\circ - 130^\circ = 50^\circ$   
 One angle =  $25^\circ, 25^\circ$

6. Can a triangle have two right angles? Explain your answer.

**Ans.** No, a triangle have not two right angle  
 Sum of three angles of triangle is  $180^\circ$ .

7. The three sides of an equilateral triangle are equal and the three angles are also equal. What is the measure of each of the angle in equilateral triangle? Why?

**Ans.** We know that the three sides of an equilateral triangle are equal and the three angles are also equal.  $60^\circ$  is the measure of each of the angle in equilateral triangle because sum of triangle =  $180^\circ$ .  
 Then; all angles are equal to  $180 \div 3 = 60^\circ$

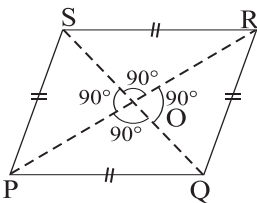
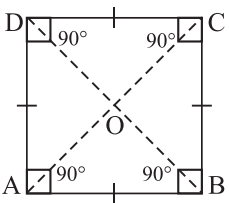
 **Exercise-11.4**

1. State whether the following statements are true or false. Correct and rewrite the false statements.

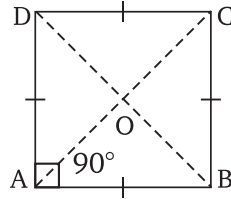
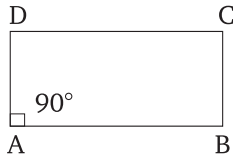
- Ans.** (a) True  
 (b) False, Every rectangle is a parallelogram  
 (c) True  
 (d) True  
 (e) False. A square is a special form of rectangle.

2. Write the similarities between :

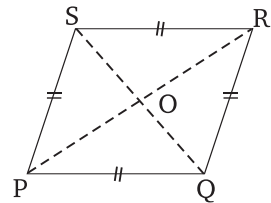
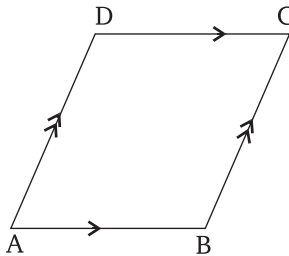
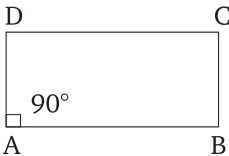
**Ans.** Square and rhombs baths have form equal side the diagonals.

<b>(a) Rhombus</b>	<b>Square</b>
Rhombus is a quadrilateral. All side of rhombus have equal length	A square is a quadrilateral. All side of square have all side equal length.
Diagonal of rhombus bisects each other at points of intersection.	Diagonal of square also bisects each other at point of intersection.
Diagonal of rhombus are perpendicular to each other at point of intersection.	Diagonals of square are perpendicular to also each other at point of intersection.
Opposite sides of rhombus are parallel to each other. 	Opposite side of square also parallel to each other. 
<b>(b) Rectangle</b>	<b>Square</b>
A rectangle is a quadrilateral.	A square is also a quadrilateral.

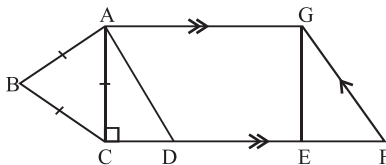
All angles of rectangle are $90^\circ$ at each vertex.	All angles of square are also of $90^\circ$ at each vertex.
Opposite side of rectangle are parallel to each other.	Opposite side of square are also parallel to each other.
Diagonal of rectangle are equal.	Diagonal of square are also equal.
Diagonals of rectangle bisect to each other.	Diagonals of square bisect of each other



(c) Rectangle	Parallelogram	Rhombus
A rectangle is a quadrilateral.	A parallelogram is also a quadrilateral.	A rhombus is also a quadrilateral.
Opposite side of rectangle are particular to each other.	Opposite sides of a parallelogram is also particular to each other.	Opposite sides of a rhombus are also parallel to each other.
Opposite angle of rectangle are equal.	Opposite angle of particular are also equal.	Opposite angle of rhombus are also equal.
Opposite sides of rectangle are equal length.	Opposite side of parallelogram are also length.	Opposite side of rhombus are also length.
Diagonal of rectangle bisects each other.	Diagonals of parallelogram are also bisects each other.	Diagonals of rhombus are also bisects each other.



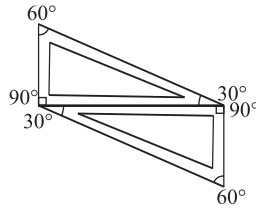
3. Name the equilateral triangle, right triangle, rectangle, trapezium and the parallelogram from the given alongside figure.



**Ans.** Equilateral triangle  $\triangle ABC$   
 Rectangle  $AGCE$   
 Parallelogram  $AGFD$

Right triangle  $ACD, \triangle EGF$   
 Trapezium  $AGFC$

4. How can you arrange four  $30^\circ$ ,  $60^\circ$ ,  $90^\circ$  set squares to form a rhombus? Draw it in your notebooks.



Ans. Place the pair of  $30^\circ$ ,  $60^\circ$  and  $90^\circ$  set square in different position to make a rhombus.



## Exercise-11.5

1. Give examples of the following from your surroundings :

- Ans. (a) Examples of cube = Ice piece, dice  
 (b) Examples of cylinder = Pipes, Pillars, Kitchen cylinder  
 (c) Examples of square pyramid = Egypt's pyramids  
 (d) Examples of sphere = football, cricket ball

2. Write the number of faces, vertex and edges of the three dimensional shapes mentioned here :

	Faces	Vertex	Edges
(a) Cylinder	0	0	3
(b) Cone	0	1	2
(c) Sphere	0	0	1
(d) Triangular prism	9	6	3
(e) Cuboid	12	8	6
(f) Triangular pyramid	6	4	4
(g) Cube	12	8	6
(h) Square pyramid	8	5	4

3. Match the following :

### Shapes

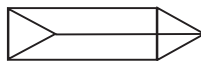
- Ans. (a) Sphere  
 (b) Cylinder  
 (c) Cuboid  
 (d) Cube

### Objects

- A cricket ball
- A coke can
- A chalk duster
- A dice

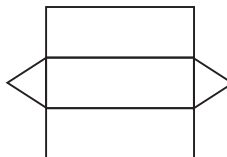
4. Draw the triangular prism and its net.

Ans.



5. Write the number of triangles in the nets of :

Ans. (a) The nets of Triangular prism

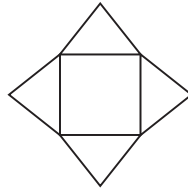


Thus, we say that 2 triangles in triangular prism.





(b) Net of Square pyramid



Thus, we say that 4 square in square prism.

**I. MCQs : Choose the correct option :**

Ans. 1. (c) 2. (b) 3. (a) 4. (a) 5. (d) 6. (a) 7. (c) 8. (c) 9. (b) 10. (c)

**II. Fill in the blanks :**

- Ans. 1. In an isosceles triangle **two** angles are equal.  
 2. A line segment has **length** but no breadth or thickness.  
 3. A **diagonal** is a line segment that joins two non-adjacent vertices of a polygon.  
 4. A polygon has at least **three** sides.  
 5. A square pyramid has **four** triangular faces and a **square** base.

**III. State True (T)/False (F) :**

Ans. 1. T 2. F 3. F 4. T 5. F

**HOTS**

1. Find the sum of the angles of an octagon.

Ans. Octagon has 8 angles and 8 sides which are equal.

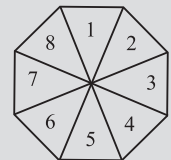
To find the sum of interior angles of an octagon, divide it up into triangles...

There are eight triangles.

Because the sum of the angles of each triangle is 180 angles of each triangle is 180 degrees. We get

$$8 \times 180^\circ = 1080^\circ$$

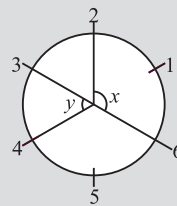
So, the sum of the interior angles of an octagon is 1080° degrees.



2. State the measure of the unknown angles  $x$  and  $y$  in each case.

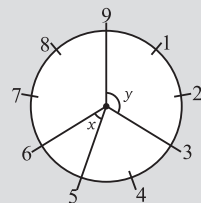
Ans. (a) A circle is divided into 6 equal parts.

*i.e.*, 1, 2, 3, 4, 5, 6  
 we also know that whole angle in a circles =  $360^\circ$   
 then, one part =  $\frac{360^\circ}{6} = 60^\circ$



By observing figure  
 $x$  belongs to two parts =  $2 \times 60^\circ = 120^\circ$   
 and  $y$  belongs to one part =  $1 \times 60^\circ = 60^\circ$

(b) Here, A circle is divided into 9 equal part  
 We also know that whole angle in a circle =  $360^\circ$   
 then one part =  $\frac{360^\circ}{9} = 40^\circ$



By observing figure,  
 $x$  belongs one part =  $1 \times 40^\circ = 40^\circ$   
 any  $y$  belong three parts =  $3 \times 40^\circ = 120^\circ$



# Construction

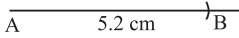
# 12



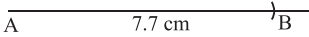
## Exercise-12.1

1. Using a ruler and a pair of compasses, draw the line segments of lengths:

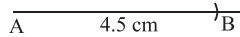
**Ans. (a) Steps of construction :**

- Fix a small well sharpened pencil to the pencil holder arm of the compass. 
- Draw any line and take a point  $A$  on it open the arms of the compass so that the metal end of compass is at 0 mark and pencil arm is on a point that represents 5.2 cm on the scale.
- Keep the metal end of the compass at the given point  $A$  of the line and mark an arc on the line so as to cut at  $B$ .  $AB$  is required line segment of length 5.2 cm.

**(b) Steps of construction :**

- Fix a small well-sharpened pencil to the pencil holder arm of the compass. 
- Draw any line and take a point  $A$  on it open the arms of the compass so that the metal end of compass is at 0 mark and pencil arm is on a point that represents 7.7 cm on the scale.
- Keep the metal end of the compass at the given point  $A$  of the line and mark an arc on the line so as to cut at  $B$ .  $AB$  is required line segment of length 7.7 cm.

**(c) Steps of construction :**

- Fix a small well sharpened pencil to the pencil holder arm of the compass. 
- Draw any line and take a point  $A$  on it open the arms of the compass so that the metal end of compass is at 0 mark and pencil arm is on a point that represent 4.5 cm on the scale.
- Keep the metal end of the compass at the given point  $A$  of the line and mark an arc on the line so as to cut at  $B$ .  $AB$  is required line segment of length 4.5

2. Draw two line segments  $AB$  and  $CD$  of lengths 3.7 cm and 5.5 cm respectively. Construct the line segment of the following lengths:

**Ans. (a)** Given  $\overline{AB} = 3.7$  cm,

$$\overline{CD} = 5.5 \text{ cm}$$

Let  $\overline{AB}$  and  $\overline{CD}$  the line segments and we have to draw a line segment  $\overline{PQ}$ .

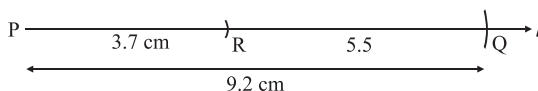
$$A \text{-----} B \\ \quad \quad \quad 3.7 \text{ cm}$$

$$C \text{-----} D \\ \quad \quad \quad 5.5 \text{ cm}$$

Such that

$$\overline{PQ} = \overline{AB} + \overline{CD}$$

Let  $\overline{AB} = \overline{PR} = 3.7$  cm and  $\overline{CD} = \overline{RQ} = 5.5$  cm



**Steps of constructions :**

- Draw a line mark a point  $P$  on it.
- Take the compass and open out the arms so that the metallic point arm falls at  $A$  and the pencil point on  $B$ .
- Keeping the metallic point arm at  $P$  cut off an arc on the line so that  $PR = AB$
- Now adjust the compasses to Length  $CD$ .
- Keeping the metallic top of the compass at  $R$ . Cut off an arc on line  $P$ , so that  $RQ = CD$ .

Thus,  $PR + RQ = AB + CD$ .

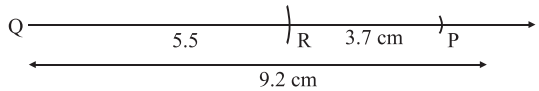
Thus,  $PQ$  is the required line segment.

- (b) Let  $CD = RQ = 5.5$  cm,  $AB = PR = 3.7$  cm

$$QP = RQ + RP$$

**Step of Construction**

- Draw a line  $l$  mark a point  $Q$  on it
- Take the compass and open out the arms so that the metallic point arm falls at  $C$  and the pencil point on  $D$ .
- Keeping the metallic point arm at  $Q$  cut out off an arc on the line so that  $RQ = CD$ .
- Now adjust the compass to length  $AB$ .



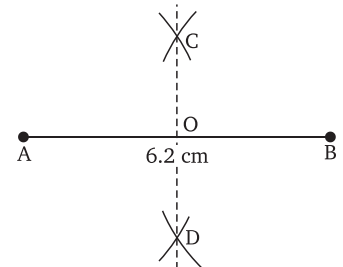
- Keeping the metallic top the compass at  $R$  cut off an arc on line  $l$ , so that  $RP = AB$ .  
Thus  $QP = RQ + RP = CD + AB$
- Therefore,  $QP$  is the required line segment.

3. Draw a line segment of length 6.2 cm and construct its perpendicular bisector.

**Ans. Steps of Construction :**

- Draw a line segment  $AB$  of length 6.2 cm.
- Taking  $A$  as the centre and with any radius more than half of  $AB$ , draw an arc on either side of  $AB$ .
- Similarly taking  $B$  as the centre and same radius as in step 2, draw another arc on either side of  $AB$  intersecting the previous arcs at  $C$  and  $D$ .
- Join  $C$  and  $D$  crossing  $AB$  at  $O$ .

Hence  $CD$  is the required perpendicular bisector of  $AB$ .

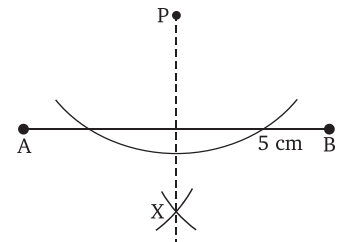


4. Draw a line segment of length 5 cm. Draw a perpendicular to the line from point P lying outside the line.

**Ans. Steps of Construction :**

- Draw a line segments  $\overline{AB}$  of length 5 cm and mark point  $P$  out side the line segment  $AB$ .
- Taking  $P$  as the center and with any suitable radius draw an arc cutting  $AB$  at  $C$  and  $D$ .
- Taking  $C$  and  $D$  as centers and with radius more than half of  $CD$  draw arcs below  $AB$  intersecting each other at  $X$  join  $X$  and  $P$ .

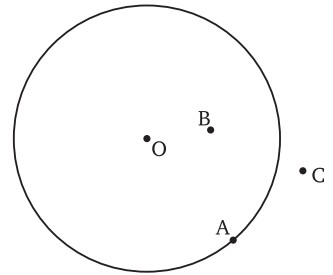
Hence  $\overline{XP}$  is the required perpendicular to the line segment  $\overline{AB}$  from  $P$  lying out side the line segment  $AB$ .



5. Draw a circle of radius 4.2 cm with center at O. Mark three points, A, B, and C such that point A is on the circle, B is in the interior and C is in the exterior of the circle.

**Ans. Steps of construction :**

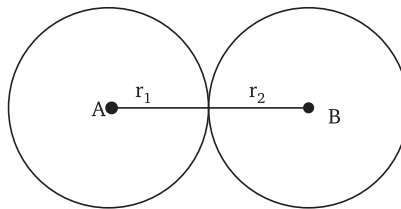
- Make any point say O on a piece of paper.
- Open the compass that its needle like pointed end and the pencil point are 5 cm.
- Place the needle like pointed end of compass at A and move the pencil point around holding the compass from the top.
- When the compass has taken one complete revolution starting from point A it comes back to the point A, we get simple closed figure circle.



Now point B at in side of circle and C at pointed at outside of circle.

6. Draw two circles of same radii. A is the centre of one circle and B is the centre of the other circle.

**Ans.**



We create the two circles of the center of A and B and join them.

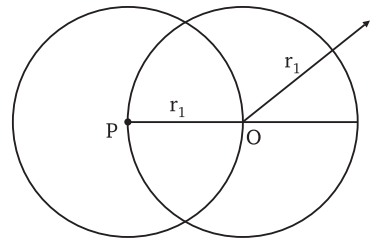
7. Draw one of the circles in such a way that it passes through the centre of the other circle.

**Ans. Steps of construction :**

$$r_1 = 2 \text{ cm,}$$

$$r_2 = 2 \text{ cm}$$

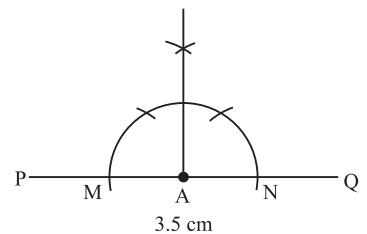
- Draw a circle of suitable radius with centre at O.
- Let the compass remain as it.
- Now from centre O, mark a point P away from it.
- Taking P as a centre, draw another circle that would pass through O.



8. Draw a line segment of length 3.5 cm. Mark a point A on it. Construct a perpendicular to the line segment passing through the point A.

**Ans. Step of construction :**

- Draw a line segment  $\overline{PQ}$  of 3.5 cm and take a on it.
- Taking A as the centre and  $\overline{PQ}$  with any convenient radius, draw an arc cutting  $\overline{PQ}$  at M and N.
- Taking M and Y as centres and with any suitable radius draw arcs cutting each other at B.

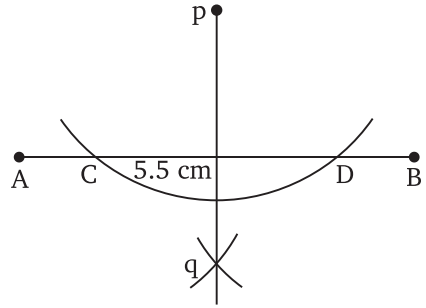


## Exercise-12.2

1. Draw any line segment AB and take a point p outside it. Construct a perpendicular on AB passing through p.

**Ans. Steps of construction :**

- Draw a line segment  $\overline{AB}$  of length 5.5 cm and mark point  $p$  outside the line segment  $AB$ .
- Taking  $p$  as the centre and with any suitable radius, draw an arc cutting  $AB$  at  $C$  and  $D$ .
- Taking  $C$  and  $D$  as centres and with radius more than half of  $CD$ , draw arcs below  $AB$  intersecting each other at  $q$ .
- Join  $p$  and  $q$ .

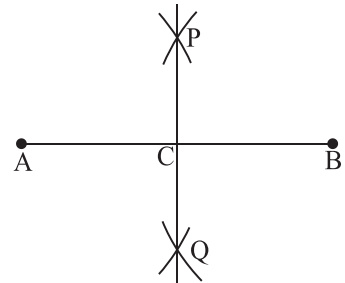


Hence,  $pq$  is the required perpendicular to the line segment  $\overline{AB}$  from point  $q$  lying outside the line segment  $AB$ .

2. Draw a line segment  $AB = 9$  cm. Using a pair of compasses find the point  $C$  such that  $AC = BC$ .

**Ans. Steps of construction :**

- Draw a line segment  $AB$  of length 9 cm.
- Taking  $A$  as the centre and with any radius more than half of  $AB$ , draw an arc on either side of  $AB$ .
- Similarly, taking  $B$  as the centre and same radius as in previous step draw another arc on either side  $AB$  intersecting the previous arcs at  $p$  and  $q$ .
- Join  $P$  and  $Q$  crossing  $AB$  at  $C$ .



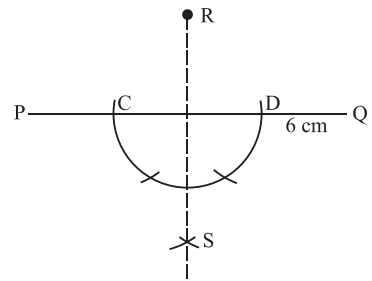
Hence,  $pq$  is the required perpendicular bisector of  $AB$ .

Measure  $AC$  and  $CB$ . We find the measurement of  $AC = CB$  and also  $\angle PCB = \angle PCA = 90^\circ$ .

3. Draw a line segment  $PQ = 6$  cm. Take a point  $R$  outside it. Construct a perpendicular on  $PQ$  passing through  $R$ .

**Ans. A line passing  $R$  which is perpendicular  $PQ$ .**

- Draw a line segment  $\overline{PQ}$  of length 6 cm and make point  $R$  outside the line segment  $PQ$ .
- Taking  $R$  as centre and with any suitable radius, draw an arc cutting  $PQ$  at  $C$  and  $D$ .
- Taking  $C$  and  $D$  as centres and with radius more than half of  $CD$ , draw arcs below  $PQ$  intersecting each other at  $S$ .
- Join  $R$  and  $S$ .

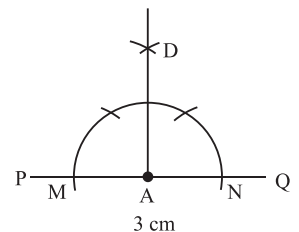


Hence,  $RS$  is required perpendicular to the line segment  $PQ$  from point  $S$  lying outside the line segment  $PQ$ .

4. Draw a line  $PQ = 5$  cm and take a point  $A$  on it such that  $AP = 3$  cm. Taking  $A$  as the centre, draw an angle of  $90^\circ$  using a pair of compasses.

**Ans. Steps of construction :**

- Draw a line segment  $\overline{PQ}$  of length 6 cm.
- Taking  $P$  as centre and cut by the arc  $PQ$  at  $a$ .
- Taking  $A$  as the centre and with any suitable radius, draw an arc  $MN$  cutting  $PQ$  at  $M$  and  $N$ .

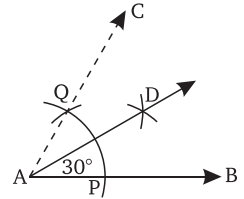


- Taking  $M$  and  $N$  as the centres and with any convenient radius draw arcs intersecting each other at  $D$ .
- Join  $AD$  to get the ray  $\overrightarrow{AD}$ .  
Then,  $\angle DAP = \angle DAQ = 90^\circ$  is required angle.

5. Using ruler and a pair of compasses, construct angles of the following measures :

Ans. (a) **Steps of construction :**

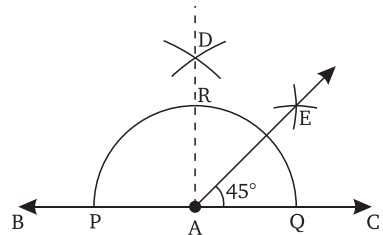
- Draw an angle of  $60^\circ$ .
- Taking  $P$  as the centre and radius greater than half of  $PQ$ , draw an arc. Taking  $Q$  as the centre and with the same radius draw another arc, cutting the previous arc at  $D$ .
- Join  $A$  and  $D$  to get the ray  $\overrightarrow{AD}$ .



$\overrightarrow{AD}$  is the angular bisector of  $\angle CAB$ . Therefore  $\angle CAD = \angle DAB = 30^\circ$ , is the required angle.

(b) **Steps of construction :**

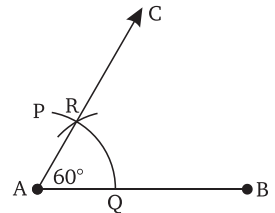
- Draw an angle of  $90^\circ$ .
- Taking  $Q$  as a centre and a radius more than half of  $QR$ , draw an arc.
- Taking  $R$  as the centre and the same radius, draw an arc cutting the previous arc at  $E$ .
- Join  $A$  and  $E$  to get the ray  $\overrightarrow{AE}$ .



$\overrightarrow{AE}$  is the angular bisector of  $\angle DAC$ . Therefore,  $\angle DAE = \angle EAC = 45^\circ$  is the required angle. Verify it by using a protractor.

(c) **Steps of construction :**

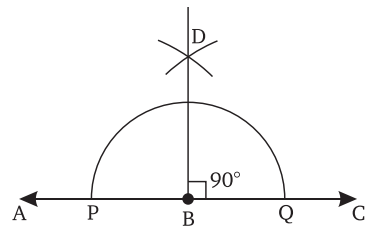
- Draw any ray  $\overrightarrow{AB}$ .
- Taking  $A$  as the centre and with any suitable radius, draw an arc  $PQ$  that cuts  $AB$  at  $Q$ .
- Taking  $Q$  as the centre and radius equal to  $AQ$ , draw an arc cutting the previous arc  $PQ$  at  $R$ .
- Join  $\overrightarrow{AR}$  and produce it to get  $\overrightarrow{AC}$ .



Thus,  $\angle BAC$  is the required angle equal to  $60^\circ$ .

(d) **Steps of construction :**

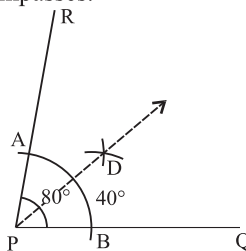
- Draw a line  $\overline{AC}$  and mark a point B on it.
- Taking  $B$  as the centre and with any suitable radius, draw an arc  $PQ$  cutting  $AC$  at  $P$  and  $Q$ .
- Taking  $P$  and  $Q$  as the centres and with any convenient radius, draw arcs intersecting each other at  $D$ .
- Join  $B$  and  $D$  to get the ray  $\overrightarrow{BD}$ .
- Then,  $\angle ABD = \angle DBC = 90^\circ$  is the required angle.



6. Draw an angle of  $80^\circ$  with a protractor and bisect it by using a pair of compasses.

**Ans. Steps of construction :**

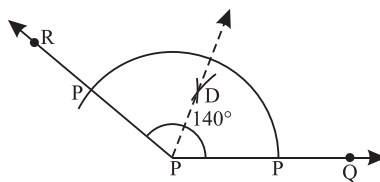
- Draw  $\angle RPQ = 80^\circ$ .
- Taking  $P$  as the centre and with any suitable radius draw an arc cutting arms  $PQ$  and  $PR$  of  $\angle RPQ$  at  $A$  and  $B$  respectively.
- Taking  $A$  as the centre and any radius more than  $\frac{1}{2} AB$  or more  $\frac{1}{2} AB$ , draw an arc.
- Similarly, taking  $B$  as the centre and with the same radius (as previous step). draw an arc intersecting the previous arc  $D$ . Join  $PD$  and produce in to get  $PD$ .
- This ray  $PD$  is the required bisector of  $\angle QPR$  or  $\angle RPQ$ .



7. Draw an angle of  $140^\circ$  with the help of a protractor and bisect it using a pair of compasses.

**Ans. Steps of construction :**

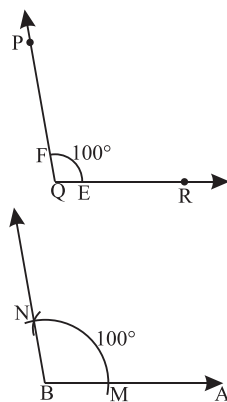
- Draw  $\angle RPQ = 140^\circ$
- Taking  $P$  as the centre and with any suitable radius draw an arc cutting arms  $PQ$  and  $PR$  of  $\angle RPQ$  at  $A$  and  $B$  respectively.
- Taking  $A$  as the centre and any radius more than half  $AB$  or more  $\frac{1}{2} AB$ , draw an arc :
- Similarly, taking  $B$  as the centre and with the same radius (as in previous step) draw an arc intersecting the previous arc  $D$ . Join  $PD$  and produce in to get  $PD$ .
- This ray  $PD$  is the required bisector of  $\angle QPR$  or  $\angle RPQ$ .



8. Draw an angle  $\angle PQR = 100^\circ$  with the help of a protractor. Now, draw  $\angle ABC = \angle PQR$  using a ruler and a pair of compasses.

**Ans. Steps of construction :**

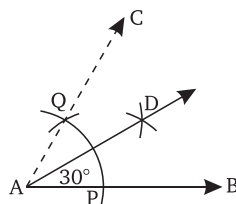
- An angle  $\angle PQR$  equal to  $\angle ABC$ .
- Taking  $Q$  as centre and any convenient radius, draw an arc cutting the arms of  $\angle ABC$  at point  $D$  and  $E$ . Draw a ray  $BA$ , with  $B$  as the centre and the same radius as above, draw an arc cutting ray  $BA$  at  $M$ .
- Taking  $M$  as the centre and radius equal to  $DE$  as in Fig. draw an arc intersecting previous arc at a point  $N$ .
- Join  $BN$  and produce it to form a ray  $AB$ .  $\angle PQR$  is the required angle equal to  $\angle ABC$  Verify it by measuring the angles using protractor.



9. Draw  $\angle ABC = 60^\circ$ . Draw the bisector of this angle.

**Ans. Steps of construction :**

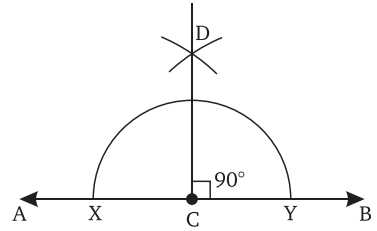
- Draw an angle of  $60^\circ$ .
- Taking  $P$  as the centre and radius greater than half of  $PQ$ , draw an arc. Taking  $Q$  as the centre and with the same radius draw another arc, cutting the previous arc at  $D$ .
- Join  $A$  and  $D$  to get the ray  $AD$ .
- $AD$  is the angular bisector of  $\angle CAB$ . Therefore  $\angle CAD = \angle DAB = 30^\circ$ , is the required angle.



10. Draw a line  $AB$  and a point  $C$  on it. Draw a line  $CD$  perpendicular to  $AB$ .

**Ans. Steps of construction :**

- Draw a line segment  $\overline{AB}$  of length 2.
- A line passing through  $P$  being perpendicular to  $AB$ .
- Draw a line segment  $\overline{AB}$  of length 5.5 cm and take a point  $C$  on it.
- Taking  $C$  as the centre and with any convenient radius, draw an arc cutting  $\overline{AB}$  at  $X$  and  $Y$ .
- Taking  $X$  and  $Y$  as centres and with any suitable radius draw arcs cutting each other at  $Q$ .
- Join  $C$  and  $D$ .
- Then  $DC$  is perpendicular to  $AB$  passing through the point  $C$ .



**I. MCQs : Choose the correct option :**

1. (b)    2. (c)    3. (a)    4. (c)    5. (d)    6. (c)



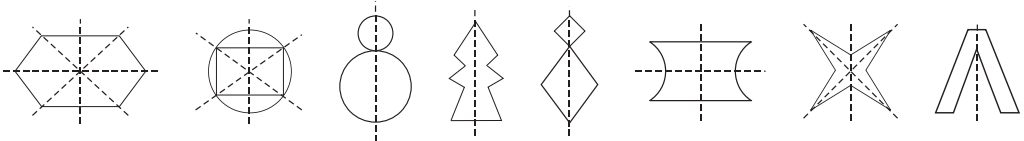
# Symmetry 13



## Exercise-13.1

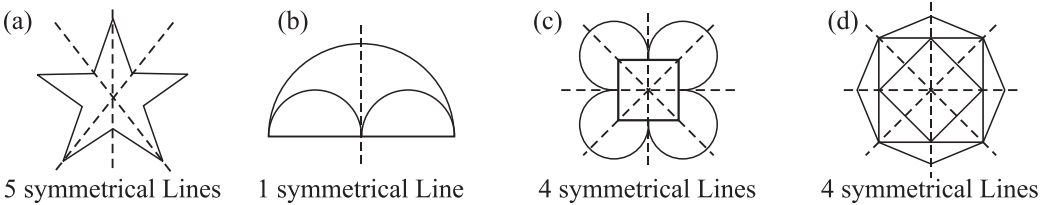
1. Draw as many line of symmetry as possible in each of the following shapes :

**Ans.**



2. How many lines of symmetry can you find in each of the following shape?

**Ans.**



3. Look at the following shapes. identify those which are symmetrical.

**Ans.** (b), (c), (d), (e), (f)

4. Among the alphabets given below, choose the ones which are symmetrical :

**Ans.**



5. Find in which of the following cases, the dotted line is a line of symmetry :

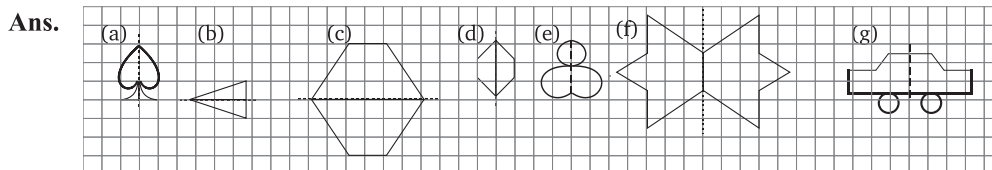
**Ans.** (a), (c), (d), (e), (f), (g), (h)



6. Use a mirror to find if the dotted line is a line of symmetry :

- Ans. (a) Yes (b) No (c) No (d) Yes  
 (e) Yes (f) Yes (g) Yes

7. Draw the other half of the following shapes :



### I. MCQs : Choose the correct option :

- Ans. 1. (a) 2. (d) 3. (b) 4. (b) 5. (c) 6. (d)

### II. Fill in the blanks :

- Ans. 1. A scalene triangle has **no** axis of symmetry. 2. A square has **4** axes of symmetry.  
 3. The letter *M* has **1** axis of symmetry. 4. The letter *N* has **no** axis of symmetry.  
 5. The letter *X* has **2** axes of symmetry.



# Perimeter and Area

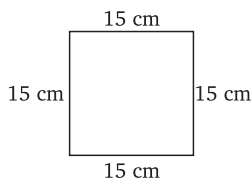
# 14



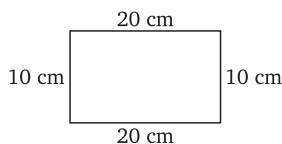
## Exercise-14.1

1. Find the perimeter of each of the following figures :

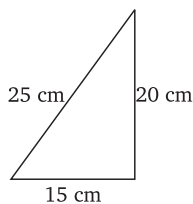
- Ans. (a) Perimeter of figure  
 $= (15 + 15 + 15 + 15)$  cm  
 $= 60$  cm



- (b) Perimeter of figure  
 $= (20 + 10 + 20 + 10)$  cm  
 $= 60$  cm

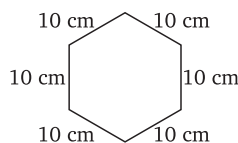


- (c) Perimeter of figure  
 $= (25 + 20 + 10)$  cm  
 $= 55$  cm

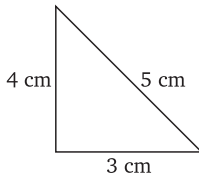


(c)

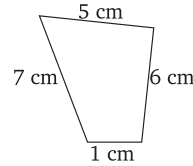
- (d) Perimeter of figure  
 $= (10 + 10 + 10 + 10 + 10 + 10)$  cm  
 $= 10 \times 6 = 60$  cm



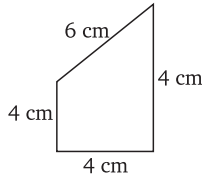
(e) Perimeter of figure =  $(4 + 5 + 3)$  cm  
 $= 12$  cm



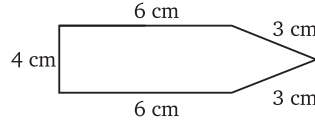
(f) Perimeter of figure =  $(5 + 6 + 1 + 7)$  cm  
 $= 19$  cm



(g) Perimeter of figure =  $(6 + 4 + 4 + 4)$  cm  
 $= 18$  cm

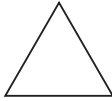


(h) Perimeter of figure =  $(6 + 3 + 3 + 6 + 4)$  cm  
 $= 22$  cm



2. The perimeter of each of the following regular polygons is 120 cm. How long is the side of the polygon?

Ans. (a) Three side in triangle = 120



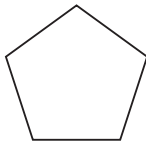
Length of triangle =  $\frac{120}{3} = 40$  cm

(b) Four sides in square.



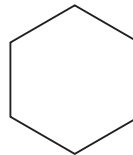
Length of square's side =  $\frac{120}{4} = 30$  cm

(c) Five sides in pentagon.



Length of pentagon's sides =  $\frac{120}{5} = 24$  cm

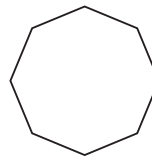
(d) Six sides in Hexagon.



Length of Hexagon's sides =  $\frac{120}{6} = 20$  cm

(e) 8 sides of octagon

Length of octagon's sides =  $\frac{120}{8} = 15$  cm



3. Find the perimeter of a square whose each side is :

Ans. (a) Perimeter =  $4 \times$  sides      Perimeter of square side =  $4 \times 10 = 40$  cm

(b) Perimeter of square side =  $4 \times 12 = 48$  cm

(c) Perimeter of square side =  $4 \times 25 = 100$  cm

(d) Perimeter of square side =  $4 \times 30 = 120$  cm

4. Find the perimeter of a triangle  $ABC$ , in which :

Ans. (a) Sides of Triangle :

$AB = 7$  cm,  $BC = 8$  cm and  $CA = 9$  cm

Perimeter of triangle = sum of side of triangle =  $7$  cm +  $8$  cm +  $9$  cm =  $24$  cm

(b) Sides of Triangle :

$$AB = 10 \text{ cm}, BC = 11 \text{ cm and } CA = 13 \text{ cm}$$

$$\text{Perimeter of Triangle} = \text{Sum of side of triangle} = 10 \text{ cm} + 11 \text{ cm} + 13 \text{ cm} = 34 \text{ cm}$$

5. A rectangle has a perimeter of 60 m. If its length is twice its breadth, what is its breadth?

**Ans.** Breadth of rectangle =  $x$  cm

$$\text{Length of recant angle} = 2x \text{ cm}$$

$$\begin{aligned} \text{Perimeter of recent angle} &= 2(l + b) \\ &= 2(2x + x) \end{aligned}$$

$$60 = 4x + 2x$$

$$60 = 6x$$

$$x = 60 \div 6 = 10$$

$$\text{Breadth of rectangle} = 10 \text{ cm}$$

$$\text{Length of rectangle} = 20 \text{ cm}$$

6. A square has a perimeter of 36 cm. What is the length of each side?

**Ans.** Perimeter of square = 36 cm

$$\text{Perimeter of square} = 4 \times \text{side}$$

$$\text{Side of square} = 36 \div 4 = 9 \text{ cm}$$

7. The side of a square garden is 80 m. If a boy wishes to walk around its boundary twice, find the distance he has to cover.

**Ans.** Side of a square garden = 80 m

$$\text{Perimeter of square} = 4 \times \text{side} = 4 \times 80 \text{ cm} = 320 \text{ m}$$

$$\text{Distance covered by a boy} = 320 \times 2 = 640 \text{ m}$$

8. A wire of length 60 cm was used to form a square. What is the length of one side of the square?

**Ans.** Total length of wire to covered a square = 60 cm

$$\text{Length of wire to covered a length} = 60 \div 4 = 15 \text{ cm}$$

9. If the perimeter of a regular hexagon is 36 cm, what is the length of one side?

**Ans.** Number of sides of hexagon = 6

$$\text{Perimeter of hexagon} = 36 \text{ cm}$$

$$\text{Length of hexagon one side} = \frac{36}{6} = 6 \text{ cm}$$

10. A triangle has a perimeter of 50 cm. If its two sides are of length 15 cm and 16 cm, what is the length of the third side?

**Ans.** Perimeter of a triangle = 50 cm

$$\text{Length of two sides} = 15 \text{ cm and } 16 \text{ cm}$$

$$\text{Let length of third sides} = x \text{ cm}$$

$$\text{Perimeter of a triangle} = \text{sum of sides}$$

$$(x + 15 + 16) \text{ cm} = 50$$

$$(31 + x) \text{ cm} = 50$$

$$x = 50 - 31 \text{ cm} = 19 \text{ cm}$$

11. A rectangular field of measure 400 m by 250 m is to be fenced with 4 rows of wire. Find the length of the wire needed.

**Ans.** Length of a rectangular field = 400 m

$$\text{Breadth of a rectangular field} = 250 \text{ m}$$

$$\text{Perimeter of a rectangular field} = 2(l + b)$$

$$= 2(400 + 250) = 2 \times 650 = 1300 \text{ m}$$

$$\text{Length of the wire needed} = 1300 \times 4 = 5200 \text{ m}$$

12. The perimeter of an isosceles triangle is 40 cm and one of the equal sides is 10 cm. Find the other sides of the triangle.

**Ans.** Perimeter of an isosceles triangle = 40 cm

One of equal sides = 10 cm

Let other side =  $x$  cm

Perimeter of isosceles triangle = sum of sides

$$10 + 10 + x = 40$$

$$20 + x = 40$$

$$x = 40 - 20 = 20 \text{ cm}$$

**13.** How many rectangles can be drawn with 36 cm as the perimeter, given that the sides are positive integers in cm? What are the possible dimensions?

**Ans.** Nine, Rectangles of dimensions 17 cm  $\times$  1 cm, 16 cm  $\times$  2 cm, 15 cm  $\times$  3 cm, 14 cm  $\times$  4 cm, 13 cm  $\times$  5 cm, 12 cm  $\times$  6 cm, 11 cm  $\times$  7 cm, 10 cm  $\times$  8 cm, 9 cm  $\times$  9 cm.

**14.** A woman athlete has to run a race of 400 m around a rectangular field. If the length of the field is 30 m and the breadth is 20 m, how many times does she run around the field?

**Ans.** Length of field = 30 m

Breadth of field = 20 m

$$\text{Perimeter} = 2(l + b) = 2(30 + 20) = 2 \times 50 = 100 \text{ cm}$$

Distance covered by woman athlete = 400 m

$$\text{Number of around} = 400 \div 100 = 4$$

**15.** The length and breadth of a rectangular field is in the ratio 7 : 5. If the length of the field is 70 m, find the cost of fencing the field at the rate of ₹ 8 per metre.

**Ans.** Ratio of length and breadth of a rectangular field = 7 : 5

If, then, Length of field = 70 m

Breadth of field = 50 m

$$\text{Perimeter of field} = 2(70 + 50) = 2 \times 120 = 240 \text{ cm}$$

$$\text{Cost of fencing} = ₹ (240 \times 8) = ₹ 1920$$

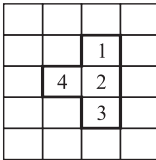


## Exercise-14.2

**1.** Find the areas of the following figures :

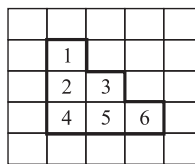
**Ans.** (a) Number of fully covered squares = 4

$$\text{Area of figure} = 4 \text{ cm}^2$$



(b) Number of fully covered squares = 6

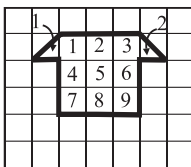
$$\text{Area of figure} = 6 \text{ cm}^2$$



(c) Number of fully covered square = 9

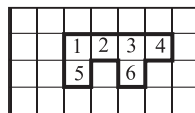
Number of half covered square = 2

$$\text{Area of figure} = 9 + 2 \times \frac{1}{2} = 9 + 1 = 10 \text{ cm}^2$$



(d) Number of fully covered square = 6

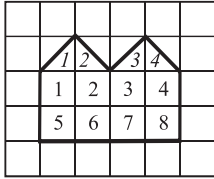
$$\text{Area of figure} = 6 \text{ cm}^2$$



2. Find the approximate area of the following figures :

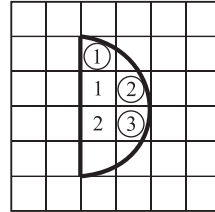
Ans. (a) Number of fully covered square = 8  
Number of half covered squares = 4

$$\text{Area} = 8 + 4 \times \frac{1}{2} = 8 + 2 = 10 \text{ cm}^2$$

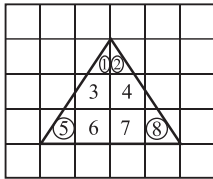


(b) Number of fully covered square = 2  
Number of more than  $\frac{1}{2}$  square = 4

$$\text{Area} = 2 + 4 = 6 \text{ cm}^2$$

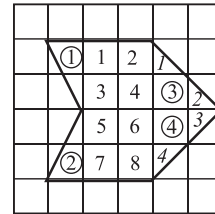


(c) Number of fully covered square = 4  
Number of more than half covered square = 4  
Area =  $4 + 4 = 8 \text{ cm}^2$



(d) Number of fully covered square = 8  
Number of more than  $\frac{1}{2}$  square = 4  
Number of half square = 4

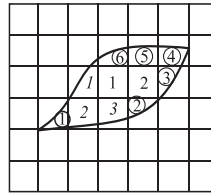
$$\text{Area of figure} = 8 + 4 + 4 \times \frac{1}{2} = 8 + 8 + 2 = 14 \text{ cm}^2$$



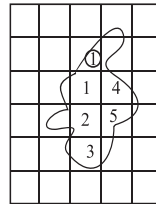
3. Find the approximate area of the following figures :

Ans. (a) Number of fully covered square = 2  
Number of more than half covered square = 3  
Number of half covered square = 6

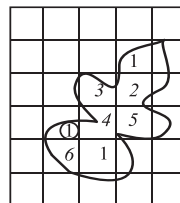
$$\text{Area of figures} = 2 + 3 + 6 \times \frac{1}{2} = 2 + 3 + 3 = 8 \text{ cm}^2$$



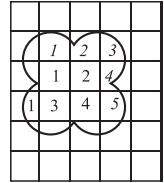
(b) Number of fully cover square = 0  
Number of more than half covered square = 5  
Number of half covered square = 1  
Area of figure =  $0 + 5 + 1 \times \frac{1}{2} = 5 \frac{1}{2} \text{ cm}^2$



(c) Number of fully cover square = 1  
Number of more than half covered square = 6  
Number of half covered square = 1  
Area of figure =  $1 + 6 + 1 \times \frac{1}{2} = 7 \frac{1}{2} \text{ cm}^2$

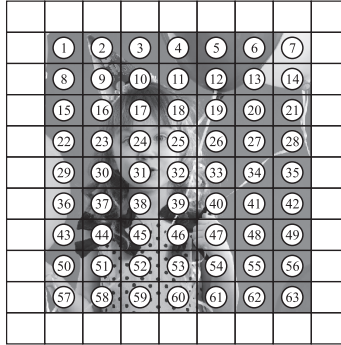


- (d) Number of fully cover square = 4  
 Number of more than half covered = 5  
 Number of half covered square 1  
 Area of figure =  $4 + 5 + 1 \frac{1}{2} = 9 \frac{1}{2} \text{ cm}^2$



4. Find the approximate area of the following things/objects, with the help of squared paper.  
 A book, a carrom coin, a 10-rupee note, a 100-rupee note, a note-book.

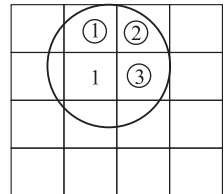
Ans. **A book :**



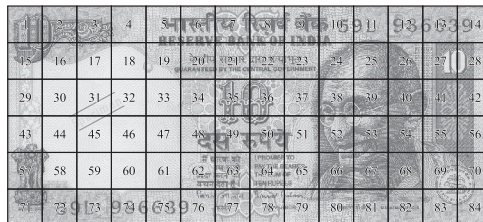
Number of fully covered square of book = 63 of book  
 Area of book =  $63 \text{ cm}^2$

**A Carrom Coin :**

Number of fully covered squares = 1  
 Number of more than = 3  
 Area of 2 Carrom Coin =  $1 + 3 = 4 \text{ cm}^2$

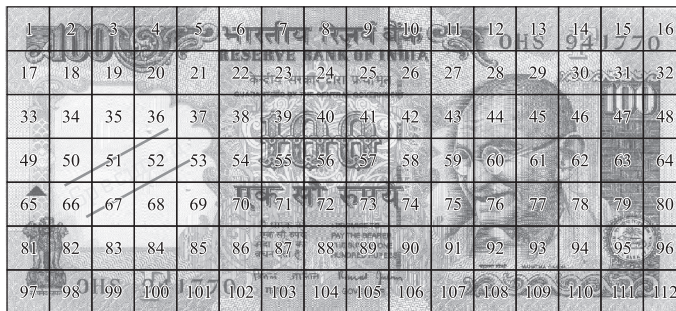


**10 Rupee Note :**



Number of fully covered square = 84  
 Area of 10 rupee note =  $84 \text{ cm}^2$

**100-Rupee Note :**



Number of fully covered square = 112

Area of 100 rupee note =  $112 \text{ cm}^2$

**Note book :**

Number of covered square = 30

Area of Note book =  $30 \text{ cm}^2$

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30



## Exercise- 14.3

1. Find the area of a rectangle whose length and breadth are given below :

(a)  $l = 6 \text{ cm}, b = 5 \text{ cm}$

$$\begin{aligned} \text{Area of rectangle} &= l \times b \\ &= 6 \times 5 \text{ cm}^2 = 30 \text{ cm}^2 \end{aligned}$$

(b)  $l = 10 \text{ cm}, b = 8 \text{ cm}$

$$\begin{aligned} \text{Area of rectangle} &= l \times b \\ &= 10 \times 8 \text{ cm}^2 = 80 \text{ cm}^2 \end{aligned}$$

(c)  $l = 25 \text{ cm}, b = 16 \text{ cm}$ .

$$\text{Area of rectangle} = l \times b = 25 \times 16 \text{ cm}^2 = 400 \text{ cm}^2$$

2. Find the area of a square whose side is :

(a) Side 9.5 cm

$$\begin{aligned} \text{Area of square} &= (\text{side})^2 \\ &= (9.5)^2 \text{ cm}^2 = 90.25 \text{ cm}^2 \end{aligned}$$

(b) Side 12.8

$$\begin{aligned} \text{Area of square} &= (\text{side})^2 \\ &= (12.8)^2 \text{ cm}^2 = 163.84 \text{ cm}^2 \end{aligned}$$

(c) Side  $10\frac{1}{2}$  cm or 10.5 cm

$$\text{Area of square} = (10.5)^2 = 110.25 \text{ cm}^2$$

3. The breadth of a rectangular field is two-fifth of its length. If its length is 20 m, find the cost of labelling it at the rate of ₹ 12 per sq. metre.

**Ans.** Length of its rectangular field = 20 m

$$\text{Breadth of its rectangular field} = 20 \times \frac{2}{5} = 8 \text{ cm}$$

$$\text{Area of rectangular field} = 20 \times 8 = 160 \text{ m}^2$$

$$\text{Cost of labelling} = ₹ 160 \times 12 = ₹ 1920$$

4. A marble tile measures 25 cm by 20 cm. How many tiles will be required to cover a wall of size 4 m by 3 m?

**Ans.** Length of a marble tile = 25 cm

Breadth of a marble tile = 20 cm

$$\text{Area of marble tile} = 25 \times 20 \text{ cm}^2 = 500 \text{ cm}^2$$

Length of a wall = 4 m or 400 cm

Breadth of a wall = 3 m or 300 cm

$$\text{Area of wall} = 400 \times 300 = 120000 \text{ cm}^2$$

$$\text{Number of tiles required} = \frac{120000}{500} = 240$$

5. How many bricks, each 25 cm long and 12 cm broad will be needed to pave a court 30 m long and 20 m wide?

**Ans.** Length of brick = 25 cm

Wide of brick = 12 cm

$$\begin{aligned} \text{Area of brick} &= 25 \times 12 \text{ cm}^2 = 300 \text{ cm}^2 \\ \text{Length of a court} &= 30 \text{ m or } 3000 \text{ cm} \\ \text{Wide of a court} &= 20 \text{ m or } 2000 \text{ cm} \\ \text{Area of a court} &= 3000 \times 2000 = 6000000 \text{ cm}^2 \\ \text{Number of brick required} &= \frac{6000000}{300} = 20000 \text{ bricks} \end{aligned}$$

6. Which of the following has a smaller area and by how much smaller? A rectangle of length 20 cm and breadth 16 cm, or a square of side 11 cm.

**Ans.**

$$\begin{aligned} \text{Length of rectangle} &= 20 \text{ cm} \\ \text{Breadth of rectangle} &= 16 \text{ cm} \\ \text{Area of rectangle} &= \text{length} \times \text{breadth} = 20 \times 16 \text{ cm}^2 = 320 \text{ cm}^2 \\ \text{Length of side of a square} &= 11 \text{ cm} \\ \text{Area of square} &= (\text{side})^2 = (11)^2 \text{ cm}^2 = 121 \text{ cm}^2 \end{aligned}$$

7. What happens to the area of square when its side is (a) doubled (b) halved (c) tripled?

**Ans.** (a) Let  $l$  and  $A$  be the side and area of the square respectively.  
 We know that  $\text{area} = \text{side} \times \text{side} = l \times l$   
 $\Rightarrow A = l \times l$  ... (i)  
 According to the question,  
 New side =  $2l$  ( $\because$  Side is doubled)  
 So,  $\text{area} = 2l \times 2l = 4(l \times l) = 4A$  [Using (i)]  
 Hence, the area of the new square is 4 times that of old square.

- (b) Let  $l$  and  $A$  be side and area of the square respectively.

We know that  $A = l \times l$   
 New side =  $l \div 2 = 0.5l$   
 $\text{area} = 0.5 \times 0.5 = 0.25A$

Hence, the area of the new square become 0.25 one fourth =

- (c) New side =  $l \times 3$   
 $\text{area} = 3l \times 3l = 9A$

Hence, the area of the new square become nine time.

8. What happens to the area of a rectangle when :

- Ans.** (a) Let length of  $l$  and breadth =  $b$

According to question,  
 New length =  $2l$ , breadth =  $b$   
 $\text{Area} = 2l \times b = 2lb$

Hence, the area of the new rectangle twice the area.

- (b) Let Length of  $l$  and breadth =  $b$

According to question,  
 New length =  $2l$ , breadth =  $2b$   
 $\text{Area} = 2l \times 2b$   
 $\text{Area} = 2l \times 2b = 4lb$

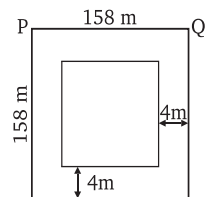
Hence the area of the new rectangle fourth of the area.

9. Inside a square garden of side 158 m, a road 4 metre wide is built all around. What is the area of the remaining part of the garden?

- Ans.** In the figure we have two squares

Length/sides of  $\square PQRS = 158 \text{ m}$

Sides of  $\square ABCD = 158 - 4 \times 2 = 150 \text{ m}$





$$\text{Area of } ABCD = 150 \times 150 \text{ m}^2 = 22500 \text{ m}^2$$

- 10.** Two rooms of floor sizes 5 m by 3 m and 6m by 5m were to be tiled with square tiles of side 50 cm. How many tiles will be needed in all?

**Ans.** In first room;

$$\text{Length} = 5 \text{ m or } 500 \text{ cm or breadth} = 3 \text{ m or } 300 \text{ cm}$$

$$\text{Area of first room} = 500 \times 300 = 150000 \text{ cm}^2$$

In second room;

$$\text{Length} = 6 \text{ m or } 600 \text{ cm, breadth} = 5 \text{ m or } 500 \text{ cm}$$

$$\text{Area of second room} = 600 \times 500 = 300000 \text{ cm}^2$$

$$\text{Side of a square tile} = 50 \text{ cm}$$

$$\text{area of square tile} = 50 \times 50 \text{ cm}^2 = 2500 \text{ cm}^2$$

$$\text{Total tile need} = \frac{150000 + 300000}{2500} = \frac{450000}{2500} = 180$$

### I. MCQs : Choose the correct option :

**Ans.** 1. (a) 2. (b) 3. (a) 4. (c) 5. (b) 6. (d) 7. (a) 8. (b)

### II. Fill in the blanks :

- Ans.** 1. The area of a rectangle is **length**  $\times$  **breadth**.  
 2. The area of a square field is  $324 \text{ m}^2$ . Then the perimeter of the square is **170 cm**.  
 3. The length and breadth of a rectangle are in the ratio 2 : 1. If its breadth is 20 m, then its perimeter is **120 m**.  
 4. The length of a rectangle is thrice its breadth. Find the area of the rectangle **3 (breadth)<sup>2</sup>**.  
 5. Perimeter of a square of side 4.5 cm is **18 cm**.

### III. State True (T)/False (F) :

**Ans.** 1. T 2. F 3. F

### HOTS

1. A room has a floor area of 6 m by 5 m. A square carpet of side 4 m is laid on it. How much of the floor area is not carpeted?

**Ans.**

$$\text{Length of room} = 6 \text{ m}$$

$$\text{Breadth of room} = 5 \text{ m}$$

$$\text{Area of room} = 6 \times 5 \text{ m}^2 = 30 \text{ m}^2$$

$$\text{Side of square carpet} = 4 \text{ m}$$

$$\text{Area of square} = 4 \times 4 \text{ m}^2 = 16 \text{ m}^2$$

$$\text{The area of a not covered carpet} = 30 - 16 \text{ m}^2 = 14 \text{ m}^2$$

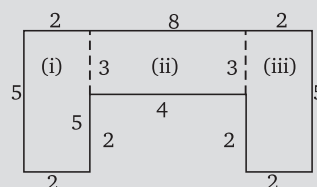
2. Find the area of the following figures by splitting them into rectangles. (All measures are given in cm).

**Ans.** (a) In the figure there are 3 rectangle

$$\text{Area of figure} = \text{sum of both three rectangle}$$

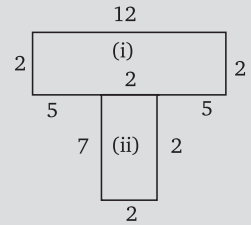
$$\text{Area of (i) + (ii) + (iii) rectangle} = 5 \times 2 + 4 \times 3 + 2 \times 5 \text{ cm}^2$$

$$= 10 + 12 + 10 \text{ cm}^2 = 32 \text{ cm}^2$$



(b) In the figure there are 2 rectangle

$$\begin{aligned} \text{Area of figure} &= \text{Area of (i)} + \text{Area of (ii)} \\ &= (12 \times 2) + (2 \times 7) \text{ cm}^2 \\ &= 24 + 14 \text{ cm}^2 \\ &= 38 \text{ cm}^2 \end{aligned}$$



# Data Handling 15

## Exercise- 15.1

1. In a class test, following marks were obtained by 40 students. Arrange these marks in a frequency distribution table, using tally marks :

1, 5, 6, 3, 8, 6, 7, 2, 8, 4, 6, 2, 5, 3, 5, 8, 9, 6, 6, 4, 4, 5, 4, 8, 6, 4, 6, 9, 7, 5, 3, 9, 1, 7, 5, 2, 4, 7, 4, 7

Ans.

Marks	Tally mark	Frequency
1		2
2		3
3		3
4		7
5		6
6		7
7		5
8		4
9		3
		Total = 40

(a) 12 students obtained 7 or more marks.

(b) 8 students obtained less than 4 marks.

2. The yearly flights of 30 Airlines from India to America are given below :

1055, 1055, 2044, 2048, 2218, 1578, 1056, 2046, 2044, 1055, 2044, 1056, 1055, 2046, 1056, 2048, 1476, 2044, 1055, 2001, 2033, 2255, 1056, 1055, 2046, 1056, 1055, 1055, 2044, 2048

Prepare a frequency distribution table using tally marks and answer the following questions :

Ans.

Flights	Tally marks	Frequency distribution
1055		8
1056		5
1476		1

1578		1
2001		1
2033		1
2044		5
2046		3
2048		3
2218		1
2255		1

- (a) 15 Airlines had flights more than ₹ 2000.  
 (b) 15 Airlines had flight more than ₹ 1000 but less than ₹ 200.  
 (c) The maximum number of flights of any Airline is 1055.  
 Range = 2255 – 1055 = 1200.

3. The final marks in English test of 30 students are as follows:

- Ans.** (a) 100 is the highest score in English test.  
 (b) 37 is the lowest score in English test.  
 (c) If 40 is the passing marks 2 students faic.  
 (d) 5 students have scored less than 50.  
 (e) Arrange in ascending order.  
 One group (30 to 39)                      37, 39  
 Second group (40 to 49)                44, 48, 48

4. The number of children in 20 families are :

**Ans.**

No. of children	Tally marks	Frequency
1		6
2		8
3		4
4		2
	<b>Total</b>	<b>20</b>

- (a) 8 families have 2 children.  
 (b) 4 is the maximum number of children in a family.  
 (c) 1 is the minimum number of children in a family.  
 (d) 2 is the most common number of children in a family of the colony.

5. The number of people showing their favourite T.V. channels is as shown by the pictograph.

- Ans.** (a) 60 Lakh people showing Life Ok channel.  
 (b) Colors is most popular T.V. Channel.  
 (c) 2.30 crore people were showing T.V channels.

6. The number of CFL tube lights made in a factory in 7 days of a week is given below :

- Ans.** (a) The factory made **300** CFLs on Tuesday.  
 (b) The factory made maximum number of CFLs on **Saturday**.

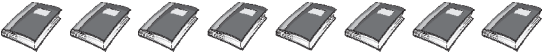
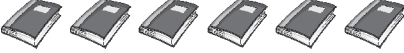


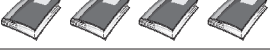

(c) The factory made minimum number of CFLs on **Wednesday**.

(d) **350** CFLs were made on Saturday.

(e) 200 CFLs were made on **Monday** and **Friday**.

7. The list given below shows the number of books issued from the school library to student for 6 days of a week :

Ans.

Week days	Number of books issued	
Monday	24	
Tuesday	18	
Wednesday	15	
Thursday	21	
Friday	12	
Saturday	9	

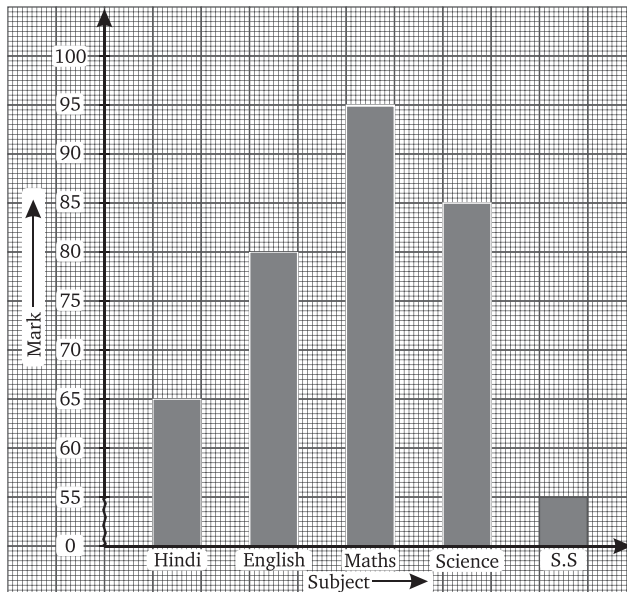


## Exercise-15.2

1. The marks obtained by a student in five subjects in an annual examination is shown below :

Subjects	Hindi	Eng	Math	Science	Social studies
Marks	65	80	95	85	55

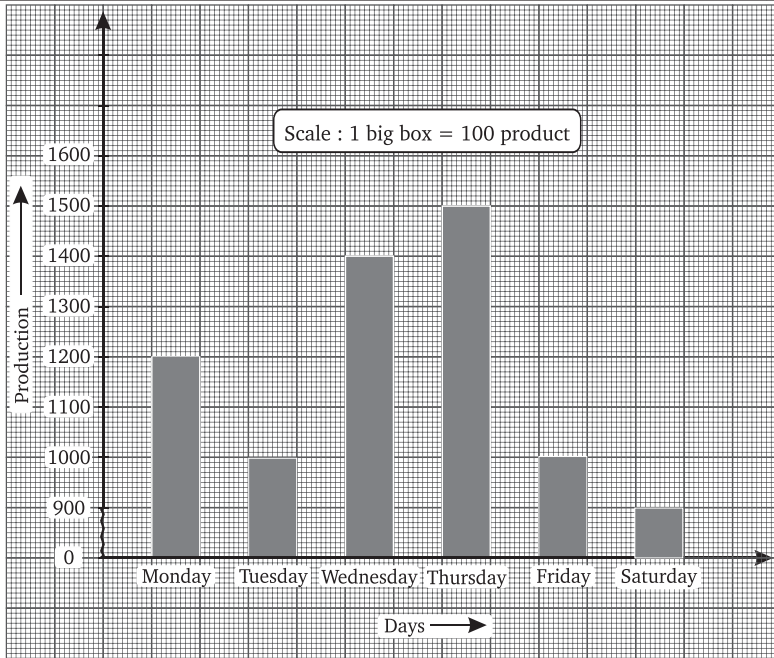
Ans.



2. The daily production of computers in a factory for different days of a week is given below :

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Production	1200	1000	1400	1500	1000	900

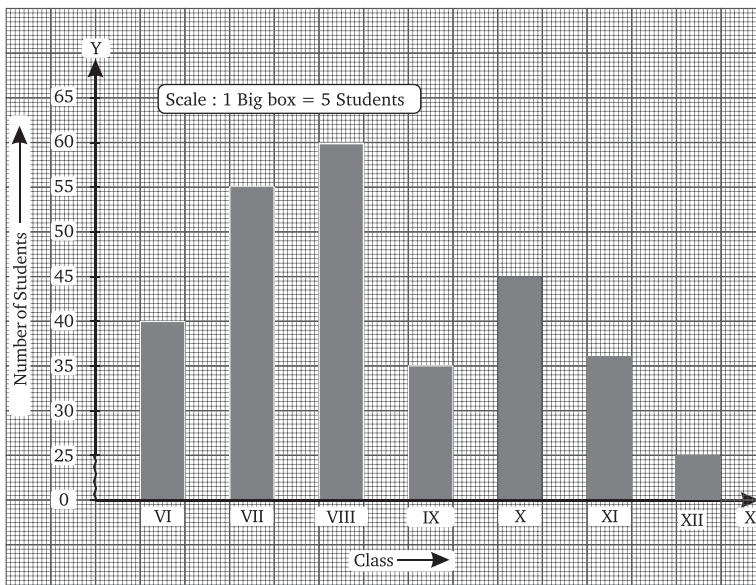
Ans.



3. The number of students admitted in a year in a school in different classes is given below. Represent the data by a bar graph.

Class	VI	VII	VIII	IX	X	XI	XII
No. of Students	40	55	60	35	45	36	25

Ans.



4. Bar graph given below shows the amount of wheat purchased by Govt. during the year 2010-2014.
- Ans.** (a) The maximum wheat production in 2014.  
 (b) The minimum wheat production in 2010.  
 (c) 2012 and 2013 two years the wheat production was same.  
 (d) 15 thousand tonnes of wheat production in 2014 was more than wheat production in 2010.
5. The total number of students in four sections of class VI of a school during the academic year 2011-12 to 2015-16 represented by the bar graph. Observe the bar graph and answer the following questions :
- Ans.** (a) There were 200 students in academic year 2014-15.  
 (b) There were 300 students in academic year 2011-12.
6. The bar-graph shows the number of goals scored by a football team per match. Read the graph and answer the questions given :
- Ans.** (a) 68 matches were played in all.  
 (b) 12 matches were scored 4 goals.  
 (c) 12 matches were scored no goal.
7. The bar graph given below shows the circulation of Newspapers in a town in eight languages and answer the following questions :
- Ans.** (a) Hindi – 900, Punjabi – 500, Urdu – 300, Tamil – 200, Marathi – 350.  
 (b) Tamil the language in which is the least number of news paper are circulated.  
 (c) The difference between the number of Hindi and English newspapers being circulated is 200.  
 (d) Hindi – 900, Eng – 700, Punjabi – 500, Marathi – 350, Urdu – 300, Tamil – 200

### I. MCQs : Choose the correct option :

- Ans.** 1. (a) 2. (a) 3. (d) 4. (a) 5. (c) 6. (b) 7. (d) 8. (a) 9. (b)

### II. Fill in the blanks:

- Ans.** 1. The numerical facts collected from an observation is called **data**.  
 2. **Raw** data is the collection of observation initially.  
 3. In the bar graph, the **width** of the bars is uniform throughout.

### III. State True (T)/ False (F) .

- Ans.** 1. F      2. F

### Mental Maths

- Ans.** The need for choosing a scale is that it helps us in drawing a graph in the most suitable way it helps us in measuring different quantity in an appropriate manner. Length of bars will be just half of the previous graph.