

1. Knowing Our Numbers

Exercise 1.1

1. (a) $80,347 =$ Eighty thousand three hundred and forty seven
 (b) $9,46,370 =$ Nine lakh forty six thousand three hundred and seventy
 (c) $1,56,532 =$ One lakh fifty six thousand five hundred and thirty two
 (d) $2,93,821 =$ Two lakh ninety three hundred eight hundred and twenty one
2. (a) $9,06,720 = 900000 + 0 + 6000 + 700 + 20 + 0$
 (b) $7,81,945 = 700000 + 80000 + 1000 + 900 + 40 + 5$
 (c) $65,483 = 60000 + 5000 + 400 + 80 + 3$
 (d) $1,11,101 = 100000 + 10000 + 1000 + 100 + 0 + 1$
3. (a) Ascending order $17,704 < 30,506 < 99,999 < 1,00,000$
 (b) Ascending order $6,213 < 99,999 < 2,37,045 < 8,23,765$
4. (a) Descending order $4,1,357 > 35,601 > 5,781 > 1,235$
 (b) Descending order $86,000 > 80,006 > 6,008 > 680$
5. (a) $35\overline{7}920$: face value = 7 place value = 7000
 (b) $1\overline{2}46686$: face value = 2 place value = 200000
 (c) $1\overline{2}345$: face value = 3 place value = 300
 (d) $340\overline{5}20$: face value = 2 place value = 20
6. (a) $300000 + 20000 + 6000 + 500 + 90 + 7 = 32,6,597$
 (b) $900000 + 8000 + 400 + 20 + 8 = 9,08,428$
 (c) $60000 + 600 + 6 = 60,606$
 (d) $800000 + 800 + 80 + 8 = 8,00,888$
7. (a) smallest number = 123457
 (b) smallest number = 135689
8. Greatest number = 765310
9. Greatest 6-digit number = 999999
 smallest 5-digit number = - 10000
 Difference $\underline{\quad 989999 \quad}$
10. Place value of 3 in 90,30,678 = 30000
 place value of 7 in 90,30,678 = + 70
 Sum $\underline{\quad 30070 \quad}$

Exercise 1.2

1. (a) 13,45,609 : Thirteen lakh forty five thousand six hundred and nine
 (b) 9,99,99,999 : Nine crore ninety nine lakh ninety nine thousand nine hundred and ninety nine
2. (a) 578,346 : Five hundred seventy eight thousand three hundred and forty six
 (b) 7,952,346 : Seven million nine hundred and fifty two thousand three hundred and forty six

3. **Indian place value chart**

(a)	TC	C	TL	L	TTh	Th	H	T	O
		9	5	0	3	5	2	0	6
(b)		2	3	4	9	5	6	0	4

4. **International place value chart**

Billions			Millions			Thousand			Ones			
(a)	HB	TB	B	HM	TM	M	HT	TTH	T	H	T	O
(b)												

5. (a) $8453765 = 8000000 + 400000 + 50000 + 3000 + 700 + 60 + 5$
 (b) $57062319 = 50000000 + 7000000 + 0 + 60000 + 2000 + 300 + 10 + 9$
6. Indian system International System
 (a) 16,77,652 a. 1,677,652
 (b) 29,27,25,387 b. 292,725,387
7. (a) Two crore thirty five lakh twenty seven 2,35,00,027
 (b) Sixty-two lakh five 62,00,005
 (c) Four crore thirty seven lakh Nineteen thousand eight 4,37,19,008
8. (a) $60000 + 5000 + 400 + 20 + 1 = 65,421$
 (b) $300000 + 70000 + 500 + 40 + 3 = 3,70,543$
 (c) $30000000 + 6000000 + 90000 + 5000 + 700 + 30 + 7 = 3,60,85,737$
 (d) $10000 + 200 + 6 = 10,206$
9. (a) $6,8,7,90456 > 68,78,345$
 (b) $8,94,098 > 89,409$
 (c) $8,20,45,899 = 8,20,45,899$
 (d) $41,03,678 < 4,61,03,678$
10. (a) Successor of $64,05,789 = 64,05,789 + 1 = 64,05,790$
 (b) Successor of $9,99,99,999 = 9,99,99,999 + 1 = 10,00,00,000$
 (c) Successor of $9,24,999 = 9,24,999 + 1 = 9,25,000$
 (d) Successor of $10,00,000 = 10,00,000 + 1 = 10,00,001$
11. (a) predecessor of $700,00,000 = 700,00,000 - 1 = 699,99,999$
 (b) predecessor of $83,24,000 = 83,24,000 - 1 = 83,23,999$
 (c) predecessor of $45,68,909 = 45,68,909 - 1 = 45,68,908$
 (d) predecessor of $61,00,000 = 61,00,000 - 60,99,999$
12. (a) 13,43,678; 13,44,678; 13,45,678; **13,46,678; 13,47,678**
 (b) 40,20,300; 40,30,400; 40,40,500; **40,50,600; 40,60,700**
13. (a) greatest number 27,09,835; smallest number 7,63,048
 (b) greatest number 3,68,92,173; smallest number 12,37,689
14. (a) greatest number 97,54,321; smallest number 12,34,579
 (b) greatest number 86,54,210; smallest number 10,24,568
15. 9000000
 \therefore $\begin{array}{r} \text{smallest 8 digit number} \quad 10000000 \\ \text{smallest 7 digit number} \quad - 1000000 \\ \hline 9000000 \end{array}$



Exercise 1.3

- Rounded to nearest thousand
 (a) $2934 = 3000$ (b) $3764 = 4000$ (c) $7951 = 8000$
- Rounded to nearest ten thousand
 (a) $585856 = 590000$ (b) $89132 = 90000$ (c) $183246 = 180000$
- Rounded to nearest lakh
 (a) $165263 = 2,00,000$ (b) $254305 = 3,00,000$ (c) $2639215 = 26,00,000$

- 62542 is estimated as = 63000
 56735 is estimated as = -57000
 estimated difference = 6000

$$\begin{array}{r} \text{Actual difference} \\ 62542 \\ - 56735 \\ \hline 5807 \end{array}$$

Actual difference > estimated difference

- 46 is estimated up = 50
 88 estimated down = 80
 50 80 4000

- (a) 63 is estimated as 60
 29 is estimated as 30

$$\text{estimated quotient } \frac{60}{30} = 2$$

- (b) 2698 is estimated as = 3000
 61 is estimated as = 60
 estimated quotient $\frac{3000}{60} = 50$

- 31750 is estimated as = 32000
 37807 is estimated as = 48000
 12397 is estimated as = $+12000$

$$\text{estimated sum} = \underline{92000}$$

- (a) 3655 is estimated as = 4000
 498 is estimated as = $+500$
 estimated sum = 4500

- (b) 2894 is estimated as = 3000
 6873 is estimated as = 7000
 350 is estimated as = $+1000$
 Nestimated sum = 11000

- (c) 7006 is estimated as = 7000
 3864 is estimated as = -4000
 Estimated difference = 3000

- (d) 863 is estimated as = 900
 534 is estimated as = -500
 estimated difference = 400



- (e) 7347 is estimated as = 7000
 2167 is estimated as = -2000
 estimated difference = $\frac{5000}{}$
9. (a) 25 is estimated as = 30 ; 73 is estimated as = 70
 estimated product $30 \ 70 \ 2100$
- (b) 491 is estimated as = 500 ; 421 is estimated as = 400
 estimated product is $500 \ 400 \ 2000000$
- (c) 659 is estimated as = 700
 34 is estimated as = 30
 estimated product as $700 \ 3 \ 2100$
10. 1712 coins is estimated as = 1700
 1238 coins is estimated as = $+1200$
 total estimated coins = $\frac{2900}{}$
11. Sugar sold in 8 days = $48 \times 8 = 384$
 estimated sugar sold = 400 kg
 estimated sugar had = 600 kg
 estimated sugar left $(600 - 400)$ kg = 200 kg
12. 355 students estimated as = 360
 62 students estimated as = 60
 estimated number of buses needed as $360 \ 60 \ 6$

Exercise 1.4

1. Number Roman number
- (a) 59 LIX
- (b) 95 XCV
- (c) 324 CCCXXIV
- (d) 447 CDXLVII
2. Roman Number Number
- (a) LXXXIII 83
- (b) XCLV 95
- (c) CDLXV 465
- (d) MDCLIV 1654
- (e) CCXLIX 249
3. (a) LVII = 57 meaningful (b) VXVIII = Meaningless
- (c) CLXXXX = Meaningless (d) CCLXIV = 264 Meaningful
- (e) MVXX = Meaningless
4. (a) LV > XL (b) LXXI > XLIX
- (55) (40) (71) (49)
- (c) XLIV < LXIV (d) XC > XL
- (44) (64) (90) (40)
5. (a) XXXV + XL = LXXV (b) LIX + XI = LXX
- (35) + (40) (75) (59) + (11) (70)
- (c) XL + XXX = LXX (d) L - XXXIX = XI
- (40) + (30) (70) (50) - (39) (11)
- (e) XCII - LXV = XXVII
- (92) - (65) (27)

Multiple Choice Questions

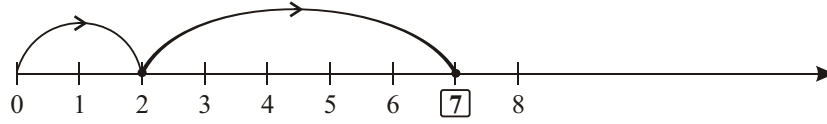
1. (c) 2. (a). 3. (b) 4. (c) 5. (d) 6. (e) 7. (c) 8. (d) 9. (c) 10. (a) 11. (b) 12. (a)



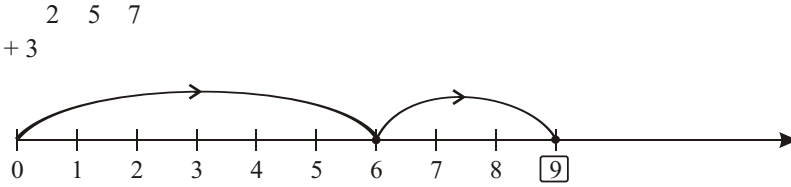
2. Whole Numbers

Exercise 2.1

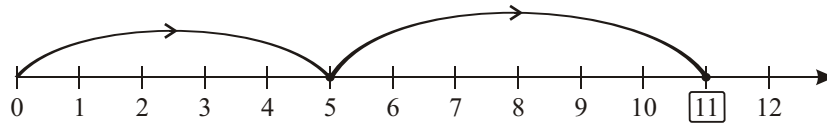
1. (a) $2 + 5$



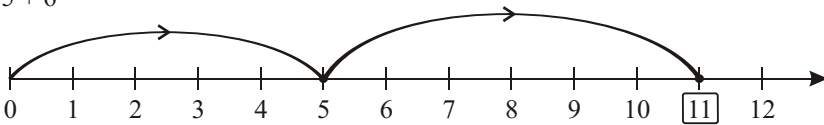
(b) $6 + 3$



(c) $4 + 3$



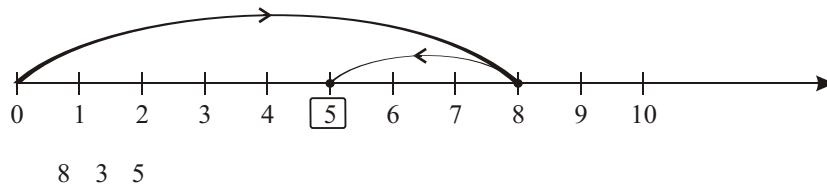
(d) $5 + 6$



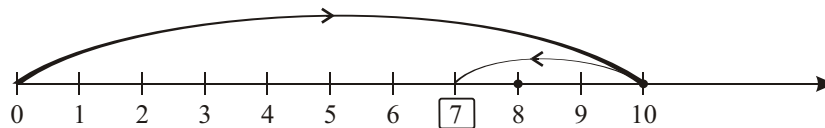
(e) $6 - 4$



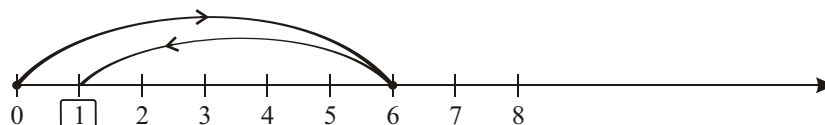
(f) $8 - 3$



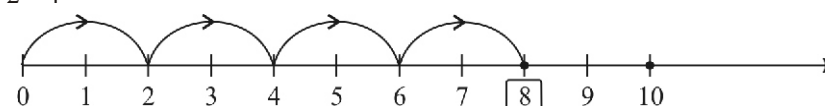
(g) 10 3



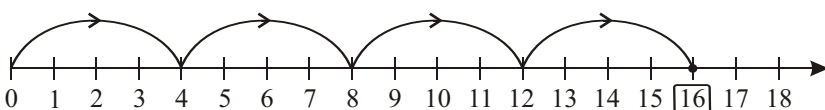
(h) 10 3 7
6 5



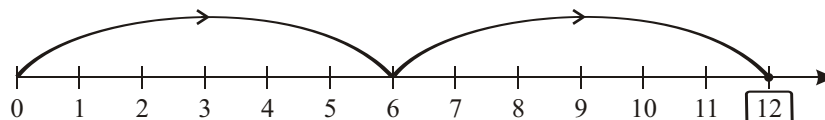
(i) 6 5 1
2 4



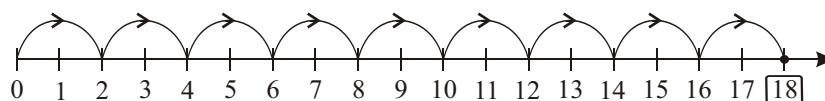
(j) 2 4 8
4 4



(k) 4 4 16
6 2



(l) 6 2 12
2 9



2 9 18

Exercise 2.2

1. (a) $325 \ 0 \ 0$ (b) $1560 \ 15 \ 15 \ 1560$
- (c) $1 \ 9999 = 9999$ (d) $6363 - 0 = 6363$
- (e) $2796 \div 1 = 2796$ (f) $213 \div 2133 = 1$
- (g) $0 \div 1236 = 0$ (h) $1710 \div 1 = 1710$
- (i) $0 \times 3696 = 0$
2. (a) Not possible (b) Possible



3. If $9 \ 15 \ 135 \ 135 \ 9 \ 15$
4. 1 is the multiplicative identity
5. product of 0 and whole number is 0
6. product of 1 and whole number is whole number
7. 0 is additive identity
8. (a) $7 + 8 = 15$
 (whole number) (whole number) = (whole number)
- (b) $3 + 14 = 17$
 (whole number) (whole number) = (whole number)
- (c) $19 + 0 = 19$
 (whole number) (whole number) = (whole number)
- (d) $0 + 0 = 0$
 (whole number) (whole number) = (whole number)
9. (a) To prove $5 + 7 = 7 + 5$
 LHS = 12 RHS = 12
 $5 + 7 = 7 + 5$
- (b) To prove $2 + 4 = 4 + 2$
 LHS = $2 + 4 = 6$; RHS = $4 + 2 = 6$
 $2 + 4 = 4 + 2$
10. (a) To prove $(3 \ 5) \ 7 = 3 \ (5 \ 7)$
 LHS $(3 \ 5) \ 7 = 8 \ 7 = 15$
 RHS $3 \ (5 \ 7) = 3 \ 12 = 15$
 $(3 \ 5) \ 7 = 3 \ (5 \ 7)$
- (b) To prove $(2 \ 4) \ 6 = 2 \ (4 \ 6)$
 LHS $(2 \ 4) \ 6 = 6 + 6 = 12$
 RHS $2 \ (4 \ 6) = 2 + 0 = 12$
 $(2 \ 4) \ 6 = 2 \ (4 \ 6)$
11. LHS RHS
 $a \ b$ $b \ a$
 $10 \ 6$ $6 \ 10$
 4 4
 $a \ b \ b \ a$
12. LHS RHS
 $a \ b$ $b \ a$
 $256 \ 175$ $175 \ 256$
 81 81
13. LHS RHS
 $a \ (b \ c) \ (a \ b) \ c$
 $12 \ 3$ $(12 \ 8) \ 5$
 9 1
 $a \ (b \ c) \ (a \ b) \ c$

14. LHS $a (b c)$ RHS $(a b) c$
 $256 (362 182)$ $(256 362) 182$
 $256 (180)$ $106 182$
 76 288

15. Verify that $b c a$ if $a b c$ for

(a)	$b c a$	If $a b c$	(b)	If $a b c$
	$5 3 c$			$23 9 c$
	$2 c$			$14 c$
	$b c a$			$b c a$
	$3 2 5$			$9 14 23$
	$5 = 5$			$9 14 23$

(a)	5	\times	15	$=$	75
	(whole number)		(whole number)		(whole number)
(b)	0	\times	7	$=$	0
	(whole number)		(whole number)		(whole number)
(c)	15	\times	12	$=$	180
	(whole number)		(whole number)		(whole number)

17. (a) To prove

	$30 14$		$14 30$
LHS	$30 14$	RHS	$14 30$
	420	$=$	420
	$30 14$	$14 30$	

(b) To prove

	$7 35$		$35 7$
LHS	$7 35$	RHS	$35 7$
	245	$=$	245
	$7 35$		$35 7$

(c) To prove

	$0 54$		$35 7$
LHS	$0 54$	RHS	$54 0$
	0	$=$	0
	$0 54$	$=$	$35 7$

18. (a) To prove

	$(3 5) 7$		$3 (5 7)$
LHS	$(3 5) 7$	RHS	$3 (5 7)$
	$8 7$		$3 12$
	15		15
	$(3 5) 7$	$3 (5 7)$	

Associative property of multiplication

To prove

	$(3 5) 7$		$3 (5 7)$
LHS	$(3 5) 7$	RHS	$3 (5 7)$
	$15 7$		$3 55$
	105		105
	$(3 5) 7$	$3 (5 7)$	

(b) Associative property of addition

To prove

$$\begin{array}{l} \text{LHS} \quad (4 \ 5) \ 0 = 4 \ (5 \ 0) \\ \quad \quad (4 \ 5) \ 0 \quad \text{RHS} \quad 4 \ (5 \ 0) \\ \quad \quad 9 \quad \quad \quad = \quad 9 \\ \quad \quad (4 \ 5) \ 0 \ 4 \ (5 \ 0) \end{array}$$

Associative property of multiplication

To prove

$$\begin{array}{l} \text{LHS} \quad (4 \ 5) \ 0 \quad \quad \quad 4 \ (5 \ 0) \\ \quad \quad (4 \ 5) \ 0 \quad \quad \text{RHS} \quad 4 \ (5 \ 0) \\ \quad \quad 20 \ 0 \quad \quad \quad \quad \quad 4 \ 0 \\ \quad \quad 0 \quad \quad \quad = \quad 0 \\ \quad \quad (4 \ 5) \ 0 \ 4 \ (5 \ 0) \end{array}$$

(c) Associative property of addition

To prove

$$\begin{array}{l} \text{LH} \quad (13 \ 11) \ 12 = 13 \ (11 \ 12) \\ \quad \quad (13 \ 11) \ 12 \quad \quad \text{RHS} \quad 13 \ (11 \ 12) \\ \quad \quad 24 \ 12 \quad \quad \quad \quad \quad 13 \ 23 \\ \quad \quad 36 \quad \quad \quad = \quad 36 \\ \quad \quad (13 \ 11) \ 12 \ 13 \ (11 \ 12) \end{array}$$

Associative property of multiplication

To prove

$$\begin{array}{l} \text{LHS} \quad (13 \ 11) \ 12 = 13 \ (11 \ 12) \\ \quad \quad (13 \ 11) \ 12 \quad \quad \text{RHS} \quad 13 \ (11 \ 12) \\ \quad \quad 143 \ 12 \quad \quad \quad \quad \quad 13 \ 132 \\ \quad \quad 1716 \quad \quad \quad = \quad 1716 \\ \quad \quad (13 \ 11) \ 12 \ 13 \ (11 \ 12) \end{array}$$

19. (a) Associative property of additive

To prove

$$\begin{array}{l} \text{LHS} \quad (2 \ 6) \ 9 = 2 \ (6 \ 9) \\ \quad \quad (2 \ 6) \ 9 \quad \quad \quad \text{RHS} \quad 2 \ (6 \ 9) \\ \quad \quad 8 \ 9 \quad \quad \quad \quad \quad 2 \ 15 \\ \quad \quad 17 \quad \quad \quad = \quad 17 \\ \quad \quad (2 \ 6) \ 9 \ 2 \ (6 \ 9) \end{array}$$

Associative property of multiplication

To prove

$$\begin{array}{l} \text{LHS} \quad (2 \ 6) \ 9 = 2 \ (6 \ 9) \\ \quad \quad (2 \ 6) \ 9 \quad \quad \quad \text{RHS} \quad 2 \ (6 \ 9) \\ \quad \quad 12 \ 9 \quad \quad \quad \quad \quad 2 \ 54 \\ \quad \quad 108 \quad \quad \quad = \quad 108 \\ \quad \quad (2 \ 6) \ 9 \ 2 \ (6 \ 9) \end{array}$$

(b) Associative property of addition

To prove

$$\begin{array}{l} \text{LHS} \quad (7 \ 3) \ 5 = 7 \ (3 \ 5) \\ \quad \quad (7 \ 3) \ 5 \quad \quad \quad \text{RHS} \quad 7 \ (3 \ 5) \\ \quad \quad 10 + 5 \quad \quad \quad \quad \quad 7 + 8 \\ \quad \quad 15 \quad \quad \quad = \quad 15 \\ \quad \quad (7 \ 3) \ 5 \ 7 \ (3 \ 5) \end{array}$$

20. (a) $a \ (b \ c)$

$$\begin{array}{l} 4 \ (3 \ 6) \\ 4 \ 9 \ 36 \end{array}$$

(b) $a \ b \ a \ c$

$$\begin{array}{l} 4 \ 3 \ 4 \ 6 \\ 12 \ 24 \ 36 \end{array}$$

21. If $a = 8, b = 5$ and $c = 2$, find the following :

$$(a) \ a (b + c) = 8 (5 + 2) = 8 \times 7 = 56$$

$$(b) \ ab + ac = 8 \times 5 + 8 \times 2 = 40 + 16 = 56$$

22. If $a = 3, b = 5$ and $c = 10$, verify :

$$(a) \ a (b + c) = 3 (5 + 10) = 3 \times 15 = 45$$

$$ab + ac = 3 \times 5 + 3 \times 10 = 15 + 30 = 45$$

$$(b) \ a (b + c) = 3 (5 + 10) = 3 \times 15 = 45$$

$$ab + ac = 3 \times 5 + 3 \times 10 = 15 + 30 = 45$$

23. If $a = 84$ and $b = 4$, verify whether $a \div b = b \div a$.

To prove

$$\text{LHS } \frac{a}{b} = \frac{84}{4} = 21$$

$$\text{RHS } \frac{b}{a} = \frac{4}{84} = \frac{1}{21}$$

24. If $a = 1002$ and $b = 3$, verify whether $a \div b = b \div a$.

$$\text{LHS } \frac{a}{b} = \frac{1002}{3} = 334$$

$$\text{RHS } \frac{b}{a} = \frac{3}{1002} = \frac{1}{334}$$

25. If $a = 24, b = 4$ and $c = 2$, verify whether $(a + b) \div c = a \div (b + c)$.

To prove

$$\text{LHS } \frac{(a + b)}{c} = \frac{(24 + 4)}{2} = \frac{28}{2} = 14$$

$$\text{RHS } \frac{a}{(b + c)} = \frac{24}{(4 + 2)} = \frac{24}{6} = 4$$

26. If $a = 64, b = 8$ and $c = 4$, verify whether $(a + b) \div c = a \div (b + c)$.

To prove

$$\text{LHS } \frac{(a + b)}{c} = \frac{(64 + 8)}{4} = \frac{72}{4} = 18$$

$$\text{RHS } \frac{a}{(b + c)} = \frac{64}{(8 + 4)} = \frac{64}{12} = \frac{16}{3}$$



27. (i) 456 17

divident = 456; divisor = 17

Quotient = 26

remainder = 14

To prove Divident = (divisor × quotient) + remainder

$$\begin{array}{r} 456 \\ 17 \overline{) 456} \\ \underline{442} \\ 14 \end{array}$$

456 = 456

verified

(ii) 259 13

Divident = 259

Quotient = 19

Divisor = 13

Remainder = 12

To verify Divident = Divisor × Quotient + remainder

$$\begin{array}{r} 259 \\ 13 \overline{) 259} \\ \underline{247} \\ 12 \end{array}$$

259 = 259

verified

28. (i) To verify $b \ c \ a$

If $a \ b \ c$

Now 56 7 c

8 c

$b \ c \ a$

7 8 56

56 = 56 verified

(ii) To verify $b \ c \ a$

13 12 156

156 = 156 verified

(iii) To verify $b \ c \ a$

If $a \ b \ c$

187 11 c

$b \ c \ a$

11 17 187

187 = 187 verified



Exercise 2.3

1. (a) 6 = $\begin{array}{ccc} \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \end{array}$ or $\begin{array}{ccc} \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet \end{array}$

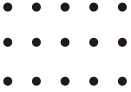
(b) 10 = $\begin{array}{cccc} \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \end{array}$ or $\begin{array}{ccc} \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \end{array}$


(c) 12 = $\begin{array}{cccc} \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \end{array}$ or $\begin{array}{ccc} \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \end{array}$ or $\begin{array}{cccccccc} \bullet & \bullet & \bullet & \bullet & \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet & \bullet & \bullet & \bullet & \bullet \end{array}$ or $\begin{array}{ccc} \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \\ \bullet & \bullet & \end{array}$





(d) $14 =$  or 

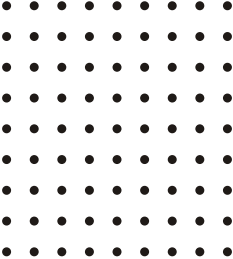
(e) $18 =$  or  or  or 

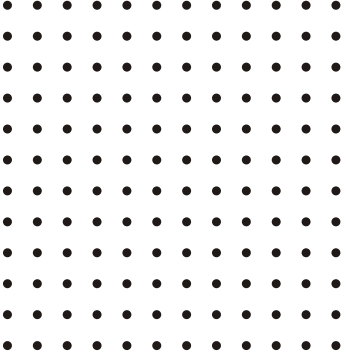
(f) $15 =$ 

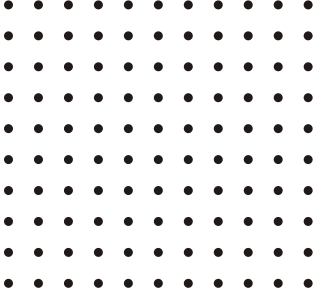
2. (a) $4 =$ 

(b) $9 =$ 

(c) $6 =$ 

(d) $81 =$ 

(e) $144 =$ 

(f) $12100 =$ 



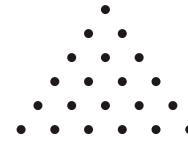
3. (a) 6



(b) 10



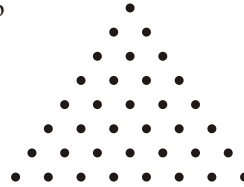
(c) 21



(d) 28



(e) 36



4. (a) 436 999

$$\begin{array}{r} 436 \ 1000 \ 1 \\ 1436 \ 1 \ 1435 \end{array}$$

(c) 829 999

$$\begin{array}{r} 829 \ 1000 \ 1 \\ 1829 \ 1 \ 1828 \end{array}$$

(e) 1892 99

$$\begin{array}{r} 1892 \ 100 \ 1 \\ 1792 \ 1 \ 1793 \end{array}$$

(b) 526 99

$$\begin{array}{r} 526 \ 100 \ 1 \\ 626 \ 1 \ 625 \end{array}$$

(d) 1256 999

$$\begin{array}{r} 1256 \ 1000 \ 1 \\ 256 \ 1 \ 257 \end{array}$$

(f) 1256 99

$$\begin{array}{r} 1256 \ (100 \ 1) \\ 125600 \ 1256 \ 124344 \end{array}$$

(g) 62939 9

$$\begin{array}{r} 629390 \ (10 \ 1) \\ = 629390 \ 62939 \ 566451 \end{array}$$

Multiple Choice Questions

1. (c). 2. (a) 3. (c) 4. (b) 5. (c) 6. (d) 7. (a) 8. (b) 9. (c) 10. (a) 11. (c)

3. Playing With Numbers

Exercise 3.1

1. $80 \{48 \ (4 \ 3)\} \ 3$

$$\begin{array}{r} 80 \ \{48 \ 12\} \ 3 \\ 80 \ 36 \ 3 \\ = 80 \ 12 \ 92 \end{array}$$

2. $49 \ [81 \ (37 \ 2)]$

$$49 \ [81 \ 74] \qquad 49 \ 7 \ 7$$

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

$$\begin{array}{r} 25 \ [12 \ \{8 \ 3 \ (54 \ 52 \ 1)\}] \\ 25 \ [12 \ \{8 \ 3 \ (3)\}] \\ 25 \ [12 \ \{1(1 \ 3)\}] \\ 25 \ [12 \ 8] \\ 25 \ 4 \ 29 \end{array}$$

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

$$75 \ \{6 \ 4 \ (4 \ 2 \ 8)\}$$



- 75 {6 4 (6 8)}
 75 {6 4 (2)}
 75 {6 4 2}
 75 12 63
5. 37 26 2 2 of 14 80 2
 37 13 28 40 50 28 40 78 40 38
6. 200 [30 {15 3 of 4}]
 200 [30 {15 12}] 200 [30 3] 200 27 5400
7. 2225 [721 {922 152 (81 of 17 21 17 1)}]
 2225 [721 {922 152 (1377 357 1)}]
 2225 [721 {922 152 (1020 1)}]
 2225 [721 {1074 1021}]
 2225 [721 53]
 2225 668 2893
8. [7835 {752 (825 115 415 5)}]
 [7835 {752 (825 115 83)}]
 [7835 {752 (940 83)}]
 [7835 {752 (940 83)}]
 [7835 {752 857}]
 7835 1609 9444

Exercise 3.2

1. (a) 16 1 16
 16 2 8
 16 4 4
 factors of 16 are 1, 2, 4, 8, 16
- (b) 125 1 125
 125 5 25
 factors of 125 = 1, 5, 25, 125
- (c) 729 1 729
 729 3 243
 729 9 81
 729 27 27
 factors of 729 = 1, 3, 9, 27, 81, 243, 729
2. (a) Multiples of 12 = 12, 24, 36, 48
 Multiples of 17 = 17, 34, 51, 68
3. (a)
$$\begin{array}{r} 14 \overline{)7364} \left(526 \right. \\ \underline{70} \\ 36 \\ \underline{-28} \\ 84 \\ \underline{-84} \\ 0 \end{array}$$

$$\therefore \begin{array}{l} \text{Remainder is 0} \\ 7364 \text{ is multiple of 14} \end{array}$$
- (b)
$$\begin{array}{r} 14 \overline{)70455} \left(1258 \right. \\ \underline{14} \\ 36 \\ \underline{-28} \\ 81 \\ \underline{-70} \\ 112 \\ \underline{-112} \\ 0 \end{array}$$

$$\therefore \begin{array}{l} \text{Remainder is 0} \\ 17612 \text{ is multiple of 14} \end{array}$$



4. (a)
$$\begin{array}{r} 33 \overline{)70455} \left(2135 \right. \\ \underline{66} \\ 44 \\ \underline{-33} \\ 115 \\ \underline{-99} \\ 165 \\ \underline{-165} \\ 0 \end{array}$$

\therefore Remainder = 0
70455 is multiple of 33

(b)
$$\begin{array}{r} 33 \overline{)70455} \left(2135 \right. \\ \underline{66} \\ 44 \\ \underline{-33} \\ 115 \\ \underline{-99} \\ 165 \\ \underline{-165} \\ 0 \end{array}$$

\therefore Remainder is 0
117018 is multiple of 33

(c)
$$\begin{array}{r} 33 \overline{)55671} \left(2135 \right. \\ \underline{33} \\ 226 \\ \underline{-198} \\ 287 \\ \underline{-264} \\ 231 \\ \underline{-231} \\ 0 \end{array}$$

\therefore Remainder is 0
55671 is multiple of 33

(d)
$$\begin{array}{r} 33 \overline{)55671} \left(2135 \right. \\ \underline{33} \\ 226 \\ \underline{-198} \\ 287 \\ \underline{-264} \\ 231 \\ \underline{-231} \\ 0 \end{array}$$

\therefore Remainder is 0
93753 is multiple of 33

5. 97 is largest prime number less than 99
6. (a) Prime numbers between 1 and 20 are 2, 3, 5, 7, 11, 13, 17, 19
(b) Prime numbers between 28 and 44 are 29, 31, 37, 41, 43
(c) Prime numbers between 90 and 120 are 97, 101, 103, 107, 109, 113
7. 7 and 2 are two prime numbers whose product is the biggest even number less than 16
8. 9 is the smallest odd composite number
9. 2 and 3 are two prime numbers whose difference is 1
10. 2 and 5 are two prime numbers whose difference is 3
11. 41 and 43 are twin prime numbers between 40 and 50
12. (a) 30 19 11 (b) 64 3 61 (c) 98 19 79
13. (a) 18, 35 are co-prime \therefore HCF of 18 and 35 = 1
(b) 27, 36 are not co-prime \therefore HCF of 27 and 36 is not 1
(c) 10, 21 are co-prime \therefore HCF of 10 and 21 are co-prime
14. 221 13 17
(prime) (prime)
15. 28 is perfect number because sum of factors
728 1 2 4 7 14 28
= 56 is twice of 28
16. 3, 13, 23, 33, 43, 53, 63, 73, 83, 93 are numbers ending with 3 less than 100
Prime numbers are 3, 13, 23, 43, 53, 73, 83
Composite numbers are 33, 63, 93



$$\begin{array}{r}
 17. \quad 1701 \overline{) 4400} \quad (2135 \\
 \quad \quad 3402 \\
 \quad \quad \hline
 \quad \quad 226 \overline{) 1701} \quad (1 \\
 \quad \quad \quad -998 \\
 \quad \quad \quad \hline
 \quad \quad \quad 703 \overline{) 998} \quad (1 \\
 \quad \quad \quad \quad -703 \\
 \quad \quad \quad \quad \hline
 \quad \quad \quad \quad 295 \overline{) 703} \quad (2 \\
 \quad \quad \quad \quad \quad -590 \\
 \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad 113 \overline{) 295} \quad (2 \\
 \quad \quad \quad \quad \quad \quad -226 \\
 \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad 69 \overline{) 113} \quad (1 \\
 \quad \quad \quad \quad \quad \quad \quad -69 \\
 \quad \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad \quad 44 \overline{) 69} \quad (1 \\
 \quad \quad \quad \quad \quad \quad \quad \quad -44 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad \quad \quad 25 \overline{) 44} \quad (1 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad -25 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad \quad \quad \quad 19 \overline{) 25} \quad (1 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad -19 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 6 \overline{) 19} \quad (3 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad -18 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 1 \overline{) 6} \quad (6 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 6 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \hline
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \times
 \end{array}$$

\therefore HCF of 1701 and 4400 is 1
1701 and 4400 are coprime

18. (i) False (ii) True (iii) False (iv) False (v) True.
19. (i) A number which has only two factors is called a **prime numbers**.
(ii) 1 is neither a **prime**, nor a **composite** number.
(iii) Every number is a **factor** and **multiple** of itself.
(iv) A number which having more than two factors is called **composite** number.
(v) **2** is the smallest prime number.
(vii) **4** is the smallest composite number.
(viii) **0** is the smallest even number.

Exercise 3.3

1. (a) 252 \therefore 252 have 2 at unit place therefore 252 is divisible by 2
252 \therefore Last two digits i.e. 52 is divisible by 4
1252 is divisible by 4
252 \therefore last three digits 252 is not divisible by 8
252 is not divisible by 8
- (b) 58332 \therefore 58332 have 2 at unit place
58322 is divisible by 2



58332 \because last two digits i.e. 32 is divisible by 4
 58332 is divisible by 4

58332 \because Last three digits i.e. 332 is not divisible by 4
 58332 is not divisible by 8

2. Test whether the following numbers are divisible by 5 or 10 :

(a) 2.33125 \because 33125 have 5 at unit place
 33125 is divisible by 5

33125 \because 33125 not have 0 at unit place
 33125 is no divisible by 10

(b) 422381 \because 422381 not have 0 or 5 at unit place
 42238 is not divisible by 5

422381 \because 422381 not have 0 at unit place
 422381 is not divisible by 10

3. (a) 7431

Sum of digits = $7 + 4 + 3 + 1 = 15$
 \because Sum of digits of 7431 is divisible 3
 \because 7431 is divisible by 3
 \because sum of digits of 7431 is not divisible by 9
 7431 is not divisible by 9

(b) 35931

Sum of digits of 35931 = $3 + 5 + 9 + 3 + 1 = 21$
 \because sum of digits of 35931 is divisible by 3
 35931 is divisible by 3
 \because sum of digits of 35931 is not divisible by 9
 35931 is not divisible by 9

4. (a) $\overline{8734}$

Sum of digits at odd places = $8 + 3 = 11$
 Sum of digits at even places = $7 + 4 = 11$
 difference $11 - 11 = 0$

(b) $\overline{542367}$

sum of digits at odd places = $5 + 2 + 6 = 13$
 sum of digits at even places = $4 + 3 + 7 = 14$
 difference $13 - 14 = -1$

\because difference is not 0 or multiple of 11
 542367 is not divisible by 11

5. (a) 7473

\because 7473 not have even number at unit place therefore it is not divisible by 2
 7473 is not divisible by 2
 7473 is not divisible by 6 also

(b) 72376

\because 92376 have even number at unit place therefore it is divisible by 2
 sum of digits of 92376 = $9 + 2 + 3 + 7 + 6 = 27$
 \because sum of digits of 92376 is divisible by 3
 92376 is divisible by 3
 \because 92376 is divisible by 2 and 3 both
 92376 is divisible by 6



6. (a) $6\ 247$
sum of digits = $6 + 2 + 4 + 7 = 19$
Next number nearest to 19 which is divisible by 3 is 21
difference is $21 - 19 = 2$ which is the required number
hence the number which is divisible by 3 is $6\underline{2}247$
- (b) $47\ 93$
sum of digits = $4 + 7 + 9 + 3 = 23$
next number nearest to 23 which is divisible by 3 is 24
difference is $24 - 23 = 1$ which is the required number
hence the number which is divisible by 3 is $47\underline{1}93$
7. (a) 7868
sum of digits = $7 + 8 + 6 + 8 = 29$
next number nearest to 29 which is divisible by 9 is 36
difference is $36 - 29 = 7$ which is the required number
hence the number which is divisible by 9 is 77868
- (b) $93\ 07$
sum of digits = $9 + 3 + 0 + 7 = 19$
next 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 93807
8. (a) $304\ 5$
sum of digits at odd places = $3 + 4 + 5 = 12$
sum of digits at even places $0\ x\ x$
difference $\underline{12\ x}$
- $12\ x$ should be 0 or multiple of 11
here smallest x should be 1
 $\therefore 12\ x\ 12\ 1\ 11$ is divisible by 11
 $304\underline{1}5$ is divisible by 11
- (b) $7x3593$
sum of digits at odd places $7 + 3 + 9 = 19$
sum of digits at even places $x\ 5\ 3\ \underline{8\ x}$
difference $\underline{11\ x}$
- $11\ x$ should be 0 or multiple of 11
here smallest x should be 0
 $\therefore 11\ x\ 11\ 0\ 11$ is divisible by 11
 $7\underline{0}3593$ is divisible by 11
9. (a) 101
The prime numbers are 2, 3, 5, 7, 11, 13, 17, 19 etc.
Let us test the divisibility of 101 by these prime numbers
101 is not divisible by 2 \therefore 101 is not even
101 is not divisible by 3 $\therefore 1 + 0 + 1 = 2$ is not divisible by 3
101 is not divisible by 5 \therefore 101 not have 0 or 5 at unit place
101 is not divisible by 7 as $101 - 7 \times 14$ leaving remainder 3
101 is not divisible by 11 as $101 - 11 \times 9$ leaving remainder 2
Next prime number is 13 which is greater than last quotient 9 therefore we need not test its divisibility by 13



largest prime number required to test whether 101 is prime or not is 11
 Since 101 is not divisible by 11
 101 is a prime number.

(b) 111
 prime numbers are 2, 3, 5, 7, 11, 13, 17 etc.
 111 is not divisible by 2 \because it is not even number
 111 is divisible by 3 as $1 + 1 + 1 = 3$ is divisible now 111 has more than two factors

111 is not a prime number
 3 is the largest prime number to test whether 111 is prime or not

(c) 397
 prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23 etc
 397 is not divisible by 2 \because 397 is not even
 397 is not divisible by 3 as $3 + 9 + 7 = 19$ is not divisible by 3
 397 is not divisible by 5 as 397 not have 5 or 0 at unit place
 397 is not divisible by 7 as $397 \div 7 = 56$ remainder 5
 397 is not divisible by 11 as $397 \div 11 = 36$ remainder is 1
 397 is not divisible by 13 as $397 \div 13 = 30$ remainder is 7
 397 is not divisible by 17 as $397 \div 17 = 23$ remainder is 6
 397 is not divisible by 19 as $397 \div 19 = 20$ remainder 17
 The next prime number is 23 which is greater than the last quotient 20 so we need not test its divisibility by 23
 Thus the greatest prime number required to test whether 397 is prime or not is 19
 Since 397 is not divisible by 19

397 is a prime number

10. If a number is divisible by 2 and 7 then it will be divisible by 14 e.g.
 28 is divisible 2 and 7 both
 28 is divisible by 14 also
11. No, if a number which is divisible by 4 and 6 it is not necessarily divisible by 24 e.g.
 12 is divisible by 6 and 4 both but 12 is not divisible by 24
12. 2530780
 twice of last digit $2 \times 0 = 0$
 number formed by remaining digits = 243078
 difference $243078 - 0 = 243078$
 243078 is not a multiple of 7
 2430780 is not divisible by 7
13. If a number divisible by both 5 and 12
 60 is the other number by which that number is always divisible
14. If a number is divisible by 12 then it will be divisible by factors of 12 also i.e. 1, 2, 3, 4, 6, 12
15. (a) True (b) False (c) False (d) False.

Exercise 3.4

1. (a) $\because 53$ is not divisible by 2
 we test the divisibility by 53 by prime number less than 8 i.e. by 2, 3, 5, 7
 $\because 53$ is not divisible by 2



- 53 is not even
53 is not divisible by 3 as $5 + 3 = 8$ is not divisible by 3
53 is not divisible by 5 as 53 not have 0 or 5 at unit place
53 is not divisible by 7 as $53 \div 7 = 7$
53 is a prime number
- (b) \therefore $14 \overline{) 14}$ $213 \overline{) 15}$
we test the divisibility of 213 by prime number less than 15 i.e. by 2, 3, 5, 7, 11, and 13
213 is not divisible by 2 as 213 is not even
213 is divisible by 3 as $2 + 1 + 3 = 6$ is divisible by 3
213 is not a prime number
- (c) \therefore $12 \overline{) 12}$ $149 \overline{) 13}$ $13 \overline{) 13}$
we test the divisibility of 149 by prime number less 13 i.e. by 2, 3, 5, 7, 11
149 is not divisible by 2 as 149 is not even
149 is not divisible by 3 as $1 + 4 + 9 = 14$ is not divisible by 3
149 is not divisible by 5 as 149 not have 0 or 5 at unit place
149 is not divisible by 7 as
 $149 \overline{) 7} = 21$ remainder 2
149 is not divisible by 11 as
 $149 \overline{) 11} = 13$ remainder 7
149 is a prime number
- (d) $383 \overline{) 19}$ $383 \overline{) 20}$ $20 \overline{) 20}$
we test the divisibility of 383 by prime number less than 20 i.e. by 2, 3, 5, 7, 11, 13, 17, 19
383 is not divisible by 2 as 383 is not even
383 is not divisible by 3 as $3 + 8 + 3 = 14$ is not divisible by 3
383 is not divisible by 5 as 383 not have 0 or 5 at unit place
383 is not divisible by 7 as $383 \overline{) 7} = 55$ remainder 2
383 is not divisible by 11 as $383 \overline{) 11} = 35$ remainder 2
383 is not divisible by 13 as $383 \overline{) 13} = 29$ remainder 10
383 is not divisible by 19 as $383 \overline{) 19} = 20$ remainder 7
383 is a prime number
- (e) \therefore $17 \overline{) 17}$ $299 \overline{) 18}$ $18 \overline{) 18}$
 \therefore we test the divisibility of 299 by prime numbers less than 8 i.e. by 2, 3, 5, 7, 11, 13, 17
299 is not divisible by 2 as 299 is not even
299 is not divisible by 3 as $2 + 9 + 9 = 20$ is not divisible by 3
299 is not divisible by 5 as 299 not have 0 or 5 at unit place
299 is not divisible by 7 as $299 \overline{) 7} = 42$ remainder 5
299 is not divisible by 11 as $299 \overline{) 11} = 27$ remainder 2
299 is divisible by 13 as $299 \overline{) 13} = 23$ remainder 0
299 is not a prime number
- (f) 577
 \therefore $24 \overline{) 24}$ $577 \overline{) 25}$ $25 \overline{) 25}$
we test the divisibility of 577 by prime number less than 25 i.e. by 2, 3, 5, 7, 11, 13, 17, 19, 23
577 is not divisible by 2 as 577 is not even



577 is not divisible by 3 as $5 + 7 + 7 = 19$ is not divisible by 3

577 is not divisible by 5 as 577 not have 5 or 0 at unit place

577 is not divisible by 7 as $577 \div 7 = 84$ remainder 3

577 is not divisible by 11 as $577 \div 11 = 52$ remainder 5

577 is not divisible by 13 as $577 \div 13 = 44$ remainder 5

577 is not divisible by 17 as $577 \div 17 = 34$ remainder 1

577 is not divisible by 19 as $577 \div 19 = 30$ remainder 7

577 is not divisible by 23 as $577 \div 23 = 25$ remainder 2

577 is a prime number

(g) $\therefore 25 \mid 25 \quad 663 \div 26 = 26$

we test the divisibility of 663 by prime numbers less than 26 .e. by 2, 3, 5, 7, 11, 13, 17, 19, 23

663 is not divisible by 2 as 663 is not even

663 is not divisible by 3 as $6 + 6 + 3 = 15$ is divisible by 3

663 is not a prime number

(h) $\therefore 16 \mid 16 \quad 263 \div 17 = 17$

we test the divisibility of 263 by prime numbers less than 17 i.e. by 2, 3, 5, 7, 11, 13

263 is not divisible by 2 as 263 is not even

263 is not divisible by 3 as $2 + 6 + 3 = 11$ it not divisible by 3

263 is not divisible by 5 as 263 not have 0 or 5 at unit place

263 is not divisible by 7 as $263 \div 7 = 37$ remainder 4

263 is not divisible by 11 as $263 \div 11 = 23$ remainder 10

263 is not divisible by 13 as $263 \div 13 = 20$ remainder 3

263 is a prime number

2. $699 \div 329 = 370$

as 370 is even therefore it is divisible by 2

difference of 699 and 329 is not prime

3. $99 \div 108 = 207$

$\therefore 14 \mid 14 \quad 207 \div 15 = 15$

prime numbers less than 15 are 2, 3, 5, 7, 11, 13

207 is not divisible by 2 as 207 is not even

207 is divisible by 3 as $2 + 0 + 7 = 9$ is divisible by 3

sum of 99 and 108 is not a prime number

4. $\therefore 20 \mid 20 \quad 439 \div 21 = 21$

prime numbers less than 21 are 2, 3, 5, 7, 11, 13, 17, 19

439 is not divisible by 2 because it is not even

439 is not divisible by 3 as $4 + 3 + 9 = 16$ is not divisible by 3

439 is not divisible by 5 as 439 not have 5 or 0 at unit place

439 is not divisible by 7 as $439 \div 7 = 62$ remainder 5

439 is not divisible by 13 as $439 \div 13 = 33$ remainder 10

439 is not divisible by 17 as $439 \div 17 = 25$ remainder 14

439 is not divisible by 19 as $439 \div 19 = 23$ remainder 2

439 is a prime number



Exercise 3.5

1. (a)

2	24
2	12
2	6
	3

(b)

2	36
2	18
3	9
3	3
	1

(c)

3	180
3	90
3	45
3	15
	1

∴ 24 = 2³ × 3

∴ 28 = 2³ × 7

(d)

3	81
3	27
3	9
3	3
	1

(e)

2	96
2	48
2	24
2	12
2	6
	3

(f)

2	120
2	60
2	30
3	15
5	5
	1

(g)

2	180
2	90
3	45
3	15
5	5
	1

(h)

2	256
2	128
2	64
2	32
2	16
2	7
2	4
	2

(i)

2	468
2	234
3	117
3	39
13	13
	1

(j)

2	630
3	315
3	105
5	35
7	7
	1

∴ 256 = 2⁸ × 2

∴ 468 = 2² × 3² × 13



$$\begin{array}{r|l}
 630 & 2 \ 2 \ 3 \ 1024^5 \ 7 \\
 \hline
 2 & 512 \\
 \hline
 2 & 256 \\
 \hline
 2 & 128 \\
 \hline
 2 & 64 \\
 \hline
 2 & 32 \\
 \hline
 2 & 16 \\
 \hline
 2 & 8 \\
 \hline
 2 & 4 \\
 \hline
 2 & 2 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 2200 \\
 \hline
 2 & 1100 \\
 \hline
 2 & 550 \\
 \hline
 5 & 275 \\
 \hline
 5 & 55 \\
 \hline
 11 & 11 \\
 \hline
 & 1
 \end{array}$$

2200 2 2 2 5 5 11

2. Smallest 4-digit number is 1000 Largest 4-digit number is 9999

$$\begin{array}{r|l}
 1024 & 2 \ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \\
 \hline
 2 & 1000 \\
 \hline
 2 & 500 \\
 \hline
 2 & 250 \\
 \hline
 5 & 125 \\
 \hline
 5 & 25 \\
 \hline
 & 5
 \end{array}$$

$$\begin{array}{r|l}
 3 & 9999 \\
 \hline
 3 & 3333 \\
 \hline
 11 & 1111 \\
 \hline
 101 & 101 \\
 \hline
 & 1
 \end{array}$$

9999 3 3 11 101

$$\begin{array}{r|l}
 1000 & 2 \ 2 \ 2 \ 5 \ 5 \ 5 \\
 \hline
 7 & 1729 \\
 \hline
 13 & 247 \\
 \hline
 19 & 19 \\
 \hline
 & 1
 \end{array}$$

1729 7 13 19

Exercise 3.6

1. (a) factors of 35 = 1, 5, 7, 35
factors of 50 = 1, 2, 5, 10, 25, 50
Common factors of 35 and 50 are 1, 5
- (b) Factors of 50 are 1, 2, 5, 10, 25, 50
factors of 120 are 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 40, 60, 120
Common factors of 50 and 120 are 1, 2, 5, 10



- (c) factors of 4 are 1, 2, 4
 factors of 8 are 1, 2, 4, 8
 factors of 12 are 1, 2, 3, 4, 6, 12
 Common factors of 4, 8, and 12 are 1, 2, 4
- (d) factors of 6 are 1, 2, 3, 6
 factors of 12 are 1, 2, 3, 4, 6, 12
 factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18, 36
 Common factors of 6, 12, 36 are 1, 2, 3, 6

2. (a)

2	42
3	21
7	7

2	56
2	28
2	14

Prime factors of 42 2 3 7
 Prime factors of 56 2 2 2 7
 HCF 2 7 14

(b)

2	24
2	12
2	6

2	72
2	36
2	18

Prime factors of 24 2 2 2 3
 Prime factors of 72 2 2 2 3 3
 HCF of 24 and 72 2 2 2 3 24

(c)

3	39
13	13
	1

2	52
2	26
13	13
	1

Prime factors of 39 3 13
 Prime factors of 52 2 2 13
 HCF of 39 and 52 = 13

(d)

2	44
2	22
11	11
	1

7	77
11	11
	1

Prime factors of 44 2 2 11
 Prime factors of 77 7 11
 HCF of 44 and 77 = 11



(e)

3	345
5	115
23	23
	1

2	506
11	253
23	23
	1

Prime factors of 345 = 3 × 5 × 23
 Prime factors of 506 = 2 × 11 × 23
 HCF of 345 and 506 = 23

(f)

3	69
2	23
23	23
	1

23	253
11	11
	1

Prime factors of 69 = 3 × 23
 Prime factors of 253 = 11 × 23
 HCF of 69 and 253 = 23

3. (a)

$$\begin{array}{r}
 390 \overline{) 520} \quad (1 \\
 \underline{390} \\
 130 \overline{) 390} \quad (3 \\
 \underline{-390} \\
 \hline
 \times
 \end{array}$$

HCF of 390 and 520 is 130

(b)

$$\begin{array}{r}
 10549 \overline{) 13563} \quad (1 \\
 \underline{10549} \\
 3014 \overline{) 10549} \quad (3 \\
 \underline{-9042} \\
 1507 \overline{) 3014} \quad (2 \\
 \underline{-3014} \\
 \hline
 0
 \end{array}$$

HCF of 10549 and 13563 = 1507

(c)

$$\begin{array}{r}
 2628 \overline{) 8541} \quad (1 \\
 \underline{7884} \\
 657 \overline{) 2628} \quad (4 \\
 \underline{-2628} \\
 \hline
 0
 \end{array}$$

HCF of 2628 and 8541 is 657



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

HCF of 1197 and 1311 is 57
 Now HCF of 57 and 627
 HCF of 1197, 1311 and 627 is 57

$$\begin{array}{r}
 57 \overline{)627} \quad (1 \\
 \underline{57} \\
 57 \\
 \underline{-57} \\
 0
 \end{array}$$

4. (a) $\frac{348}{1024}$

$$\frac{348}{1024} = \frac{4}{4} \times \frac{87}{256}$$

$$\begin{array}{r}
 348 \overline{)1024} \quad (2135 \\
 \underline{696} \\
 328 \overline{)348} \quad (1 \\
 \underline{-328} \\
 20 \overline{)328} \quad (1 \\
 \underline{-20} \\
 128 \\
 \underline{120} \\
 8 \overline{)20} \quad (2 \\
 \underline{-16} \\
 4 \overline{)8} \quad (2 \\
 \underline{-8} \\
 \times
 \end{array}$$

HCF of 348, 1024 = 4

(b) $\frac{744}{1023}$

$$\frac{744}{1023} = \frac{93}{93} \times \frac{8}{11}$$

$$\begin{array}{r}
 744 \overline{)1023} \quad (2135 \\
 \underline{744} \\
 279 \overline{)744} \quad (2 \\
 \underline{-558} \\
 186 \overline{)279} \quad (1 \\
 \underline{-186} \\
 93 \overline{)186} \quad (2 \\
 \underline{-186} \\
 \times
 \end{array}$$

HCF of 744 and 1023 = 93

(c) $\frac{625}{3125}$

$$\frac{625}{3125} = \frac{625}{625} \times \frac{1}{5}$$

$$\begin{array}{r}
 625 \overline{)3125} \quad (1258 \\
 \underline{-3125} \\
 \times
 \end{array}$$

HCF of 625 and 3125 is 625



$$(d) \frac{117}{270}$$

$$\frac{117}{270} = \frac{9}{9} \cdot \frac{13}{30}$$

HCF of 117 and 270 is 9

5. $348 - 3 = 345$, $625 - 5 = 621$
 \therefore 69 is the largest number that divides 348 and 626
 leaving remainders 3 and 5 respectively

$$\begin{array}{r} 177 \overline{) 270} \quad (2135 \\ \underline{234} \\ 36 \overline{) 117} \quad (3 \\ \underline{-108} \\ 9 \overline{) 36} \quad (4 \\ \underline{-36} \\ 0 \end{array}$$

6. $283 - 3 = 280$, $390 - 5 = 385$, $532 - 7 = 525$
 Now HCF of 35 and 525

35 is the largest number that divides 283, 390
 and 532 leaving remainders 3, 5 and 7
 respectively

$$\begin{array}{r} 35 \overline{) 525} \quad (1258 \\ \underline{35} \\ 175 \\ \underline{-175} \\ 0 \end{array}$$

HCF of 280, 385 and 525 is 35

7. To find least number of marble stone we have to take largest size of marble stone
 \therefore HCF of 1120 cm and 960 cm

$$\begin{array}{r} 960 \overline{) 1120} \quad (2135 \\ \underline{960} \\ 160 \overline{) 960} \quad (6 \\ \underline{-960} \\ \times \end{array}$$

Largest side of stone is 160 cm

$$\text{number of stones} = \frac{\text{Area of wall}}{\text{Area of stone}} = \frac{1120 \times 960}{160 \times 160} = 42$$



$$\begin{array}{r}
 8. \quad 208 \overline{) 494} \left(2 \right. \\
 \quad \underline{416} \\
 \quad 78 \overline{) 208} \left(2 \right. \\
 \quad \quad \underline{-156} \\
 \quad \quad 52 \overline{) 78} \left(1 \right. \\
 \quad \quad \quad \underline{-52} \\
 \quad \quad \quad 26 \overline{) 52} \left(2 \right. \\
 \quad \quad \quad \quad \underline{-52} \\
 \quad \quad \quad \quad \quad \underline{0}
 \end{array}
 \qquad
 \text{Now,}
 \qquad
 \begin{array}{r}
 26 \overline{) 949} \left(36 \right. \\
 \quad \underline{78} \\
 \quad 169 \\
 \quad \underline{-156} \\
 \quad 13 \overline{) 26} \left(2 \right. \\
 \quad \quad \underline{-26} \\
 \quad \quad \quad \underline{0}
 \end{array}$$

13 kg is the capacity of a bag to put them in exact number of bags.

9. Maximum capacity of container is the HCF of 1470 l, 2688 l, and 4032 l

$$\begin{array}{r}
 1470 \overline{) 2688} \left(2135 \right. \\
 \quad \underline{1470} \\
 \quad 1218 \overline{) 1470} \left(1 \right. \\
 \quad \quad \underline{-1218} \\
 \quad \quad 252 \overline{) 1218} \left(4 \right. \\
 \quad \quad \quad \underline{-1008} \\
 \quad \quad \quad 210 \overline{) 252} \left(1 \right. \\
 \quad \quad \quad \quad \underline{-210} \\
 \quad \quad \quad \quad 42 \overline{) 210} \left(5 \right. \\
 \quad \quad \quad \quad \quad \underline{-210} \\
 \quad \quad \quad \quad \quad \quad \underline{\times}
 \end{array}$$

$$\begin{array}{r}
 42 \overline{) 4032} \left(36 \right. \\
 \quad \underline{378} \\
 \quad 252 \\
 \quad \underline{-252} \\
 \quad \quad \underline{0}
 \end{array}$$

Now HCF of 42 and 4032

42 l is the maximum capacity of a container which can measure the water of each container in exact number of times

Exercise 3.7

1. (a) Multiple of 4 = 4, 8, **12**, 16, 20, **24**, 28, 32, **36**
 Multiple of 6 = 6, **12**, 18, **24**, 30, **36**, 42.....
 first three common multiple of 4 and 6 are 12, 24, 36.
- (b) Multiple of 12 = 12, 24, **36**, 48, 60, **72**, 84, 96, **108**..
 Multiple of 18 = 18, **36**, 54, **72**, 90, **108**.....
 first three common multiple of 12 and 18 are 36, 72, 108
- (c) Multiple of 3 = 3, 6, 9, 12, 15, 18, 21, 24, **30**, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60
 Multiple = 5, 10, 15, 20, 25, **30**, 35, 40, 45, 50, 55, **60**.....
 Multiple of 6 = 6, 12, 18, 24, **30**, 36, 42, 48, 54, **60**....
 first three common multiple of 3, 5 and 6 are 30, 60, 90
- (d) Multiple of 2 = 2, 4, 6, **8**, 10, 12, 14, **16**, 18, 20, 22, **24**...
 Multiple of 4 = 4, **8**, 12, **16**, 20, **24**, 28....
 Multiple of 8 = **8**, **16**, **24**, 32....
 first three common multiple of 8, 4 and 2 are 8, 16, 24

2. (a)

2	12, 20
2	6, 10
3	3, 5
5	1, 5
	1, 1

LCM of 12 and 20
 $= 2 \times 2 \times 3 \times 5 = 60$

(b)

2	20, 36
2	10, 18
3	5, 9
3	5, 3
5	5, 1
	1, 1

LCM of 20 and 36
 $= 2 \times 2 \times 3 \times 3 \times 5 = 180$

3. (a) denominators are 8, 11

2	8, 11
2	4, 11
2	2, 11
11	1, 11
	1, 1

LCM of 8, 11
 $= 2 \times 2 \times 2 \times 11 = 88$

(b) denominators are 65, 91, 117

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

LCM of 65, 91, 117
 $= 3 \times 3 \times 5 \times 7 \times 13 = 4095$

(c) denominators are 24, 23, 48

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

LCM $2 \times 2 \times 2 \times 2 \times 3 \times 23 = 48 \times 23 = 1104$

(d) denominators are 91, 1547

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

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

4. LCM of 18, 37

LCM $2 \times 3 \times 3 \times 37 = 666$

smallest number which when divided by 18 and 37 leaves remainder 3 in each case is $666 + 3 = 669$

2	18, 37
3	9, 37
3	3, 37
37	1, 37
	1, 1



5. They will toll again after LCM of 16, 24, 32
LCM

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

6. bell will toll again after $2 \times 2 \times 2 \times 2 \times 3 = 96$ seconds
They will be at starting point again after LCM of 110, 130
and 150

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

they will be a starting point again after
($2 \times 3 \times 5 \times 5 \times 11 \times 13$) seconds 21450 seconds 356.5
minutes

7. Least number of shots are LCM of (28, 32, 42) + 5

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

Least number of shots a help contain

($2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 7$) 5
(32 21) 5
672 5
677 shots



8. Minimum distance is 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

Minimum distance three persons walk so that all can cover same distance in complete steps is

$$(2 \ 2 \ 2 \ 2 \ 3 \ 3 \ 5 \ 17) \ 12240 \text{ cm}$$

or $= 122.40 \text{ m}$

Exercise 3.8

1. $\therefore \text{LCM} \times \text{HCF} = \text{Product of number}$

$$\text{LCM} \times 24 = 4800$$

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

2. $\therefore \text{LCM} \times \text{HCF} = \text{Ist no.} \times \text{IInd no.}$

$$1667 \ 17 \ 199 \ \text{IInd no.}$$

$$\frac{1666 \ 17}{119} \ \text{IInd no.}$$

$$238 = \text{IInd no.}$$

3. $\therefore \text{LCM} \times \text{HCF} = \text{Product of number}$

$$782 \times \text{HCF} = 1564$$

$$\text{HCF} = \frac{1564}{782} = 2$$

4. HCF of 3, 4, 5

$$\text{LCM} \ 2 \ 2 \ 3 \ 5 \ 60$$

$$\text{HCF} = 1$$

$$\text{Product of numbers} \ 3 \ 4 \ 5 \ 60$$

$$\text{LCM} \times \text{HCF} \ 1 \ 60 \ 60$$

$$\text{Yes product of numbers} = \text{HCF} \times \text{LCM}$$

5. $\therefore 17$ is not the factor of 999

$$\text{If HCF} = 17$$

then LCM cannot be 999

2	3, 4, 5
2	3, 2, 5
3	3, 1, 5
5	1, 1, 5
	1, 1, 1

17	999	36
	85	
	149	
	136	
	13	



$$\begin{array}{r} 6. \quad \because \quad 1111 \overline{) 2222} \quad 2 \\ \underline{2222} \\ 0 \end{array}$$

2	1111, 2222
1111	1111, 1111
	1, 1

HCF = 1111
LCM = 2 × 1111 = 2222

$$\begin{array}{r} 7. \quad \because \quad \text{LCM} \times \text{HCF} = \text{Ist no.} \times \text{IInd no.} \\ 1160 \times 29 = 290 \times \text{IInd no.} \\ \frac{1160 \times 29}{290} = \text{IInd no.} \\ 116 = \text{IInd no.} \end{array}$$

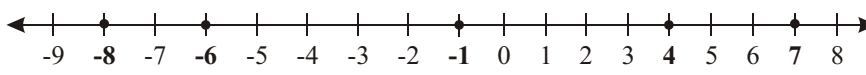
Multiple Choice Questions

Tick (✓) the correct answer.

1. (b) 2. (c) 3. (b) 4. (d) 5. (a) 6. (b) 7. (b) 8. (b) 9. (b) 10. (a) 11. (a) 12. (c) 13. (b).

4. Integers

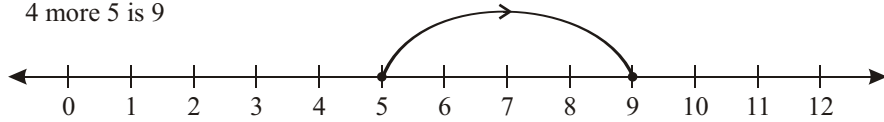
Exercise 4.1

- (a) + ₹ 5000 (b) – 10 mm (c) + 45 km (d) – 1 km (e) – 4°C (f) – 300 m (g) + 1800 m (h) – 500 m
- (a) Opposites of 234 234 (b) Opposites of 2085 2085
(c) Opposites of 4096 4096
- (a) $5 < 8$ (b) $1 < 0$ (c) $0 > 6$ (d) $7 > 7$ (e) 20 4 (f) 15 16
(g) 40 50 (h) 150 200 (i) 300 4125 (j) 416 417
- (a) Integers between 0 and 8 are 1, 2, 3, 4, 5, 6, 7
(b) Integers 0 and 8 are 1, 2, 3, 4, 5, 6, 7
(c) Integers between –4 and 4 are –3, –2, –1, 0, 1, 2, 3
(d) Integers between –10 and 19 are –11, –12, –13, –14, –15, –16, –17, –18
(e) Integers between 111 and 115 are 112, 113, 114
- (a) Five integers greater than 22 are 21, 20, 19, 18, 17
(b) Five integers greater than 96 are 95, 94, 93, 92, 91
(c) Five integers less than 32 are 33, 34, 35, 36, 37
(d) Five integers less than 70 are 71, 72, 73, 74, 75
- There is no greatest negative integer
There is no greater positive integer also
- (a) 
- (a) Ascending order 10 9 7 5 0 3 5
(b) Ascending order 84 48 45 3 30
- (a) Descending order 0 37 68 73 86
(b) descending order 157 – 175 517 715 751
- (a) 3°C is warmer (b) 6°C is colder (c) 8°C is lower
- (a) 8, 6, 4, 2, 0, 2 (b) 40, 35, 30, 25, 20, 15
(c) 21, 18, 15, 12, 9, 6 (d) 16, 13, 10, 7, 4, 1

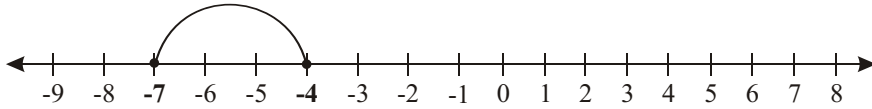
(e) 66, 60, 54, 48, 42, 36

(f) 84, 72, 60, 48, 36, 24

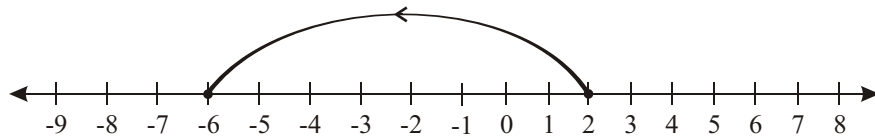
12. (a) 4 more 5 is 9



(b) 3 more than 7 is 4



(c) 8 less than 2 is 6



(d) 2 less than 3 is 5



13. (a) false 0 is neither positive nor negative

(b) false there is no smallest negative integer

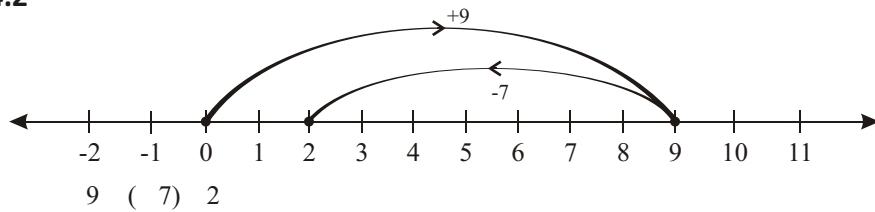
(c) True

(d) True

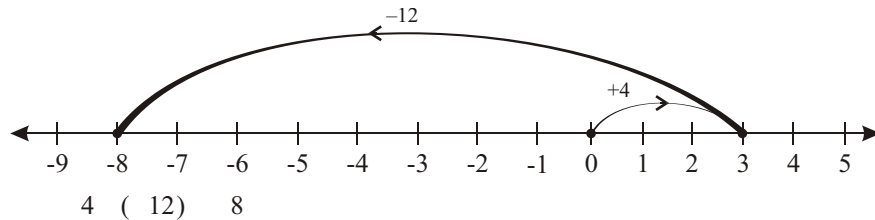
(e) True.

Exercise 4.2

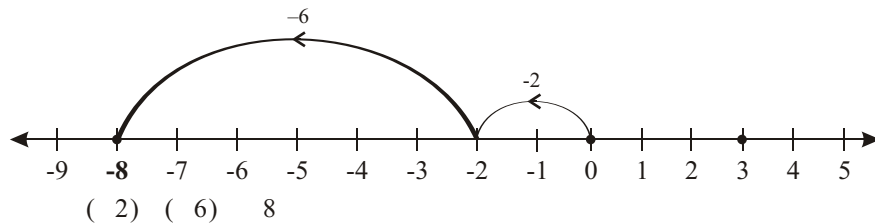
1. (a)

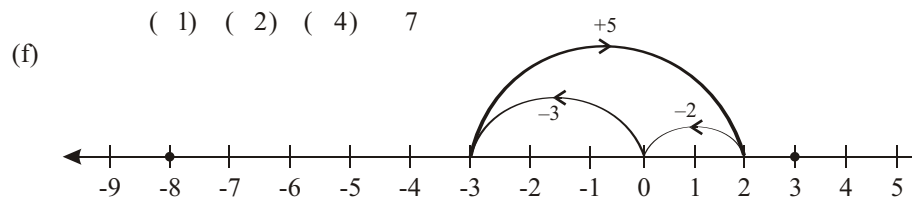
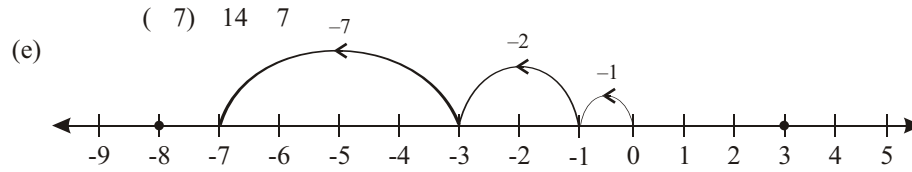
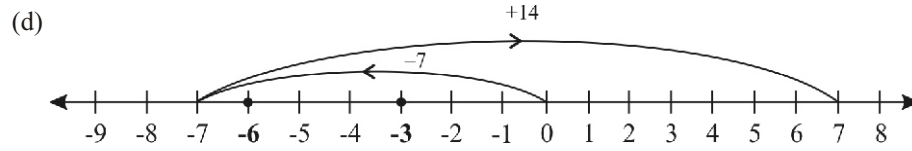


(b)



(c)





- (3) 5 (2) 0
2. (a) 13 8 5 (b) 45 24 21
 (c) 256 150 106 (d) 315 (100)
 315 100 415
- (e) 500 (680)
 500 680 1180
- (f) 20 8 12
- (g) 463 254 209
- (h) 1060 900 160
- (i) 500 (850) 500 850 1350
- (j) 961 (1009) = 961 1009 1970
3. (a) 168 (345) 168 345 137
 (b) 831 831 0
 (c) 40 (190) 320
 40 190 320
 230 320 90
- (d) 512 69 171 512 240 272
4. (a) 54 (3) (66) 17
 54 3 66 17
 54 69 17 71 69 2
- (b) 8 (9) 7 18
 8 9 7 18
 = 17 25 8
- (c) 30 (43) (63) 55
 30 43 63 55
 30 106 55
 85 106 21



(d) $6 (7) 34 26$

$$\begin{array}{r} 6 \ 7 \ 34 \ 26 \\ 13 \ 60 \ 47 \end{array}$$

(e) $65 \ 87 (43) (55) 65$

$$\begin{array}{r} 65 \ 87 \ 43 \ 55 \ 65 \\ 65 \ 43 \ 55 \ 87 \ 65 \\ 163 \ 152 \ 11 \end{array}$$

5. (a) True (b) False (c) False (d) False (e) False.

6. (a) $-3 + 15 = 12$ (b) $-8 + 3 = -5$ (c) $-9 + -7 = -16$

(d) $-4 + 27 = 23$ (e) $-2 + (-10) = -12$ (f) $-15 + 15 = 0$

(g) $-1 + 6 = 5$ (h) $29 + 16 = 45$

7. temperature at night $4 \ 7 \ 3 \text{ C}$

Exercise 4.3

1. (a) $8 \ 3 \ 5$ (b) $36 \ 21 \ 15$ (c) $83 \ 90 \ 7$

(d) $10 (18) 10 \ 18 \ 8$

(e) $25 \ 15 \ 40$ (f) $46 (50) 46 \ 50 \ 4$

2. (a) $15 (16) 15 \ 16 \ 1$

(b) $286 (451) 286 \ 451 \ 165$

(c) $2154 (5123) 2154 \ 5123 \ 7277$

(d) $562 \ 9 (1040) 562 \ 1040 \ 478$

(e) $52 (52) 52 \ 52 \ 104$

3. (a) $10 \ 5 \ 1 \ 351$

$$\begin{array}{r} 10 \ 5 \ 35 \ 15 \ 35 \ 20 \end{array}$$

(b) $15 \ 34 \ 14 \ 6$

$$\begin{array}{r} 15 \ 14 \ 6 \ 34 \ 35 \ 34 \ 1 \end{array}$$

(c) $8 (9) (80) 8 \ 9 \ 80 \ 97$

(d) $100 (100) (100) 100 \ 100 \ 100 \ 300$

(e) $26 (13) (52) 26 \ 13 \ 52 \ 91$

(f) $13 (17) (22) (40)$

$$\begin{array}{r} 13 \ 17 \ 22 \ 40 \\ 30 \ 62 \ 32 \end{array}$$

(g) $28 (26) 3 (7) 9$

$$\begin{array}{r} 28 \ 26 \ 3 \ 7 \ 9 \\ 54 \ 3 \ 16 \\ 70 \ 3 \ 67 \end{array}$$

(h) $55 (19) 21 \ 25$

$$\begin{array}{r} 55 \ 19 \ 21 \ 25 \\ 55 \ 21 \ 19 \ 25 \\ 76 \ 44 \ 32 \end{array}$$

(i) $84 (99) 33 (28) 46$

$$\begin{array}{r} 84 \ 99 \ 33 \ 28 \ 46 \\ 84 \ 33 \ 28 \ 99 \ 46 \\ 145 \ 145 \ 0 \end{array}$$

(j) $150 \ 560 (420)$

$$\begin{array}{r} 150 \ 560 \ 420 \\ 150 \ 980 \ 830 \end{array}$$



4. (a) $34 - 24 = 10$ (b) $-27 + 8 = -19$ (c) $-7 + 7 = 0$
 (d) $841 + (-329) = 512$ (e) $-4 + (-8) = -12$
5. (a) $\begin{array}{r} 24 \\ -6 \\ \hline \end{array}$ $\begin{array}{r} 32 \\ -1 \\ \hline \end{array}$ (b) $\begin{array}{r} 65 \\ 11 \\ -11 \\ \hline \end{array}$ $\begin{array}{r} 65 \\ 65 \\ -11 \\ \hline \end{array}$
 (c) $\begin{array}{r} 45 \\ 45 \\ 53 \\ \hline \end{array}$ $\begin{array}{r} 57 \\ 57 \\ 56 \\ \hline \end{array}$ (d) $\begin{array}{r} 83 \\ 83 \\ -73 \\ \hline \end{array}$ $\begin{array}{r} 93 \\ 73 \\ -73 \\ \hline \end{array}$
 (e) $\begin{array}{r} 50 \\ 50 \\ 90 \\ \hline \end{array}$ $\begin{array}{r} 60 \\ 90 \\ -90 \\ \hline \end{array}$ (f) $\begin{array}{r} 163 \\ 163 \\ 280 \\ \hline \end{array}$ $\begin{array}{r} 163 \\ 117 \\ -280 \\ \hline \end{array}$
 (g) $\begin{array}{r} 631 \\ 222 \\ \hline \end{array}$ $\begin{array}{r} 853 \\ 1000 \\ -1115 \\ \hline \end{array}$ (h) $\begin{array}{r} 78 \\ 8 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ 97 \\ 10 \\ 87 \\ \hline \end{array}$

6. Temperature at night $2\ 5$
 $3\ C$

7. Ist position of submarine $700\ m$
 New position of sub marine $700\ 250\ 450\ m$

8. Tota marks $= 35\ (5)\ (10)\ 20$
 $35\ 5\ 10\ 20$
 $35\ 20\ 5\ 10$
 $55\ 15\ 40\ marks$

9. Temperature on friday $4\ C$
 Temperature on saturday $(4\ 3)\ C$
 $7\ C$
 $7\ 5\ 2\ C$

10. (a) Temperature was $5\ C$ and dropped by $2^\circ C$ the plce has become more colder than before
 (b) The temperature was $8^\circ C$ and drop by $3^\circ C$ the plce has become colder than before
 (c) The temperature was $3\ C$ and increases by $4^\circ C$ the place has become warmer than before
 (d) Temperature was $3^\circ C$ and increases by $5^\circ C$ the plce has become warmer than before
 (e) Temperature was $6\ C$ and drop by $7^\circ C$ the plce has become more colder than before.

Multiple Choice Questions

Tick (✓) the correct answer.

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

Formative Assesment-1

Tick (✓) the correct answer.

1. (b) 2. (c) 3. (b) 4. (a) 5. (c) 6. (b) 7. (a) 8. (c) 9. (b) 10. (c) 11. (a) 12. (a) 13. (a) 14. (b) 15. (a) 16. (b) 17. (b) 18. (c) 19. (a) 20. (c).