(b) $84.117 = 80 + 4 + \dfrac{1}{10} + \dfrac{1}{100} + \dfrac{7}{1000}$

$\qquad = 80 + 4 + 0.1 + 0.01 + 0.007$

(c) $97.131 = 90 + 7 + \dfrac{1}{10} + \dfrac{3}{100} + \dfrac{1}{1000}$

$\qquad = 90 + 7 + 0.1 + 0.03 + 0.001$

(d) $1340.815 = 1000 + 300 + 40 + \dfrac{8}{10} + \dfrac{1}{100} + \dfrac{5}{1000}$

$\qquad = 1000 + 300 + 40 + 0.8 + 0.01 + 0.005$

(e) $2330.228 = 2000 + 300 + 30 + \dfrac{2}{10} + \dfrac{2}{100} + \dfrac{8}{1000}$

$\qquad = 2000 + 300 + 30 + 0.2 + 0.02 + 0.008$

(f) $4165.877 = 4000 + 100 + 60 + 5 + \dfrac{8}{10} + \dfrac{7}{100} + \dfrac{7}{1000}$

$\qquad = 4000 + 100 + 60 + 5 + 0.8 + 0.07 + 0.007$

12. Measurement

Exercise 12.1

1.　(a)　25 m
　　　　1 m　$= 100$ cm
　　　　25 m $= 25 \times 100$ cm
　　　　　　$= 2500$ cm

(b)　8 km
　　　1 km $= 1000$ m
　　　8 km $= 8 \times 1000$ m
　　　　　$= 8000$ m

(c)　15 kg
　　　1 kg　$= 1000$ gm
　　　15 kg $= 15 \times 1000$ gm
　　　　　　$= 15000$ gm

(d)　$7l$
　　　$1l = 1000\,ml$
　　　$7l = 7 \times 1000\,ml$
　　　　　$= 7000\,ml$

(e)　$16l$
　　　$1l = 1000\,ml$
　　　$16l = 16 \times 1000\,ml$
　　　　　$= 16000\,ml$

(f)　9 kg
　　　1 kg $= 1000$ gm
　　　9 kg $= 9 \times 1000$ gm
　　　　　$= 9000$ gm

2.　(a)　10 mm　$<$　100 cm
　　(c)　100 g　$=$　1 kg
　　(e)　6000 ml　$=$　$6l$

(b)　100 ml　$<$　$1l$
(d)　23 g　$>$　230 mg
(e)　15 m　$>$　150 mm

Exercise 12.2

1.　(a)　centimetres, decimetres, metres, hectometres
　　(b)　millilitres, decilitres, litres, kilolitres
　　(c)　milligrams, centigrams, grams, kilograms

2.　(a)　3000 cm $+ 70$ m $=$ _____ m

　　　1 cm $= \dfrac{1}{1000}$ m

　　　3000 cm $+ 70$ cm

　　　$= \dfrac{3000}{1000}$ m $+ 70$ m

　　　$= 30$ m $+ 70$ m $= 100$ m

(b)　78 dm $=$ _____ cm

　　　1 dm　$= 10$ cm

　　　78 dm $= 78 \times 10$ cm

　　　　　　$= 780$ cm

(c) 9700 ml = _____ l _____ ml

$$1 \text{ m}l = \frac{1}{1000} l$$

9700 ml = 9000 ml + 700 ml

$$= \frac{9000}{1000} l + 700 \text{ m}l$$

$$= 9l + 700 \text{ m}l = 9l \; 700 \text{ m}l$$

(d) 95000 ml = _____ l

$$1 \text{ m}l = \frac{1}{1000} l$$

$$95000 \text{ m}l = \frac{95000}{1000} l$$

$$= 95 \; l$$

(e) 40000 mg = _____ l

$$1 \text{ mg} = \frac{1}{1000000} \text{ kg}$$

$$40000 \text{ mg} = \frac{40000}{1000000} \text{ kg}$$

$$= 0.04 \text{ kg}$$

(f) 65 hm = _____ cm

1 hm = 10000 cm

65 hm = 65 × 10000

$$= 650000 \text{ cm}$$

(g) 8 dal = _____ l

1 dal = 10 l

8 dal = 80 l

(h) 4998 cm + 2 cm = _____ m

$$= 5000 \text{ cm}$$

$$= \frac{5000}{100} \text{ m} \qquad \left(1 \text{ cm} = \frac{1}{100} \text{ m}\right)$$

$$= 50 \text{ m}$$

(i) 16 g = _____ mg

1 g = 1000 mg

16 g = 16 × 1000 mg

$$= 16000 \text{ mg}$$

(j) 806050 ml = _____ l + _____ ml

$$1 \text{ m}l = \frac{1}{1000} l$$

806050 ml = 806000 ml + 50 ml

$$= \frac{806000}{1000} l + 50 \text{ m}l$$

$$= 806 \; l + 50 \text{ m}l$$

$$= 806 \; l \; 50 \text{ m}l$$

3. (a) 4 km 8 hm

1 km = 1000 m

1 hm = 100 m

4 km 8 hm = 4 km + 8 hm

$= 4 × 1000 \text{ m} + 8 × 100 \text{ m}$

$= 4000 \text{ m} + 800 \text{ m}$

$= 4800 \text{ m}.$

(b) 5876 cm

$$1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$5876 \text{ cm} = \frac{5876}{100} \text{ m}$$

$$= 58.76 \text{ cm or } 58 \text{ m } 76 \text{ cm.}$$

(c) 3241 mm

1 mm = 1000 m

$$3241 \text{ mm} = \frac{3241}{1000} \text{ m}$$

$$= 3.241 \text{ m or } 3 \text{ m } 241 \text{ cm}$$

4. (a) 34 kg

$1 \text{ kg} = 1000 \text{ gm}$

$34 \text{ kg} = 34 \times 1000 \text{ g}$

$\qquad = 34000 \text{ g}$

(b) 67 hg 5 dag

$1 \text{ hg} = 100 \text{ g}$

$1 \text{ dag} = 10 \text{ dg}$

$67 \text{ hg } 5 \text{ dag} = 67 \text{ hg} + 5 \text{ dag}$

$\qquad = 67 \times 100 \text{ g} + 5 \times 10 \text{ g}$

$\qquad = 6700 \text{ g} + 50 \text{ g}$

$\qquad = 6750 \text{ g}$

(c) 1300 mg

$1 \text{ mg} = \dfrac{1}{1000} \text{ g}$

$1300 \text{ mg} = \dfrac{1300}{1000} \text{ g} = 1.3 \text{ g or } 1 \text{ g } 300 \text{ mg.}$

5. (a) 7809 ml

$1 \text{ m}l = \dfrac{1}{1000} l$

$7809 \text{ m}l = \dfrac{7809}{1000} l$

$\qquad = 7.809 \, l \text{ or } 7l\,809 \text{ m}l$

(b) 130 dl

$1\text{d}l = \dfrac{1}{10} l$

$130\text{d}l = \dfrac{130}{10} l$

$\qquad = 13 \, l$

(c) 9008 ml

$1\text{m}l = \dfrac{1}{1000} l$

$9008 \text{ m}l = 9008 \text{ m}l = \dfrac{9008}{1000} l = 9.008 \, l \text{ or } 9l\,8 \text{ m}l$

6. (a) 30 mm

$1 \text{ mm} = \dfrac{1}{10} \text{ cm}$

$30 \text{ mm} = \dfrac{30}{10} \text{ cm} = 3 \text{ cm.}$

(b) 830 dm

$1 \text{ dm} = 10 \text{ cm}$

$830 \text{ dm} = 830 \times 10 \text{ cm} = 8300 \text{ cm}$

(c) 6 km

$1 \text{ km} = 100000 \text{ cm}$

$6 \text{ km} = 6 \times 100000 \text{ cm} = 6,00,00 \text{ cm}$

7. (a) 1200 g

$1 \text{ g} = \dfrac{1}{1000} \text{ kg}$

$1200 \text{ g} = \dfrac{1200}{1000} \text{ kg}$

$\qquad = 1.2 \text{ kg or } 1 \text{ kg } 200 \text{ g.}$

(b) 54600 dg

$1 \text{ dg} = \dfrac{1}{10000} \text{ kg}$

$54600 \text{ dg} = \dfrac{54600}{10000} \text{ kg}$

$\qquad = 5.460 \text{ kg or } 5 \text{ kg } 460 \text{ g}$

(c) 890 hg

$1 \text{ hg} = \dfrac{1}{10} \text{ kg}$

$890 \text{ hg} = \dfrac{890}{10} \text{ kg} = 89 \text{ kg.}$

8. (a) 13 l

$1l = 1000 \text{ m}l$

$13 l = 13 \times 1000 \text{ m}l$

$\qquad = 13000 \text{ m}l$

(b) 78cl

$1\text{c}l = 10 \text{ m}l$

$78\text{c}l = 78 \times 10 \text{ m}l$

$\qquad = 780 \text{ m}l$

(c) 80dl

   1dl = 100 ml

   80dl = 80 × 100 ml = 8000 ml

Exercise 12.3

1. (a)

m	cm
15	25
+ 8	65
23	90

∴ 15 m 25 cm + 8 m 65 cm
   = 23 m 90 cm

(b)

m	cm
75	250
+ 62	127
137	377

∴ 75 kg 250 g + 62 kg 127 g
   = 137 kg 377 g

(c)

km	m
42	175
+ 69	675
111	850

∴ 42 km 175 m + 69 km 675 m
   = 111 km 850 m

(d)

l	ml
8	455
+ 16	285
24	740

∴ 8l 455 ml + 16l 285 ml
   = 24 l 740 ml

(e)

kg	g
①	
54	672
+ 67	372
122	044

∴ 54 kg 672 g + 67 kg 372 g
   = 122 kg 44 g

(f)

l	ml
33	333
+ 66	666
99	999

∴ 33 l 333 ml + 66 l 666 ml
   = 99 l 999 ml

(g)

km	m
128	256
+ 64	128
192	384

∴ 128 km 256 m + 64 km 128 m
   = 192 km 384 m

(h)

m	cm
85	67
+ 37	27
122	94

∴ 85 m 67 cm + 37 m 27 cm
   = 122 m 94 cm

(i)

kg	g
2	50
+ 13	150
15	200

∴ 2 kg 50 g + 13 kg 150 g = 15 kg 200 g

2. (a)

kg	g
2 1	11
3̶2̶	1̶00
− 17	400
14	700

∴ 32 kg 100 g – 17 kg 400 g
   = 14 kg 700 g.

(b)

l	ml
9	12
1̶0̶	2̶50
− 5	650
4	600

∴ 10 l 250 ml – 5 l 650 ml
   = 4 l 600 ml

(c)

km	m
4	16
5̶5̶	6̶25
− 34	800
20	825

∴ 55 km 625 m – 34 km 800 m
= 20 km 825 m.

(d)

m	cm
1 17	3 10
2̶7̶	4̶0̶
− 19	25
8	15

∴ 27 m 40 cm – 19 m 25 cm
= 8 m 15 cm.

(e)

kg	g
7 10	13
8̶1̶	3̶50
− 73	450
7	900

∴ 81 kg 350 g – 73 kg 450 g
= 7 kg 900 g.

(f)

l	ml
7	16
8̶8̶	6̶72
− 74	900
13	772

∴ 88 l 672 ml – 74 l 900 ml
= 13 l 772 ml

(g)

m	cm
8 12	
9̶2̶	66
− 88	46
4	20

∴ 92 m 66 cm – 88 m 46 cm
= 4 m 20 cm.

(h)

km	m
11	16 9
6 ̶7̶	6̶ 1̶0̶ 10
7̶2̶	7̶0̶0̶
− 66	825
5	875

∴ 72 km 700 m – 66 km 825 m
= 5 km 875 m

(i)

kg	g
2	14
2̶3̶	4̶55
− 12	630
10	825

∴ 23 kg 455 g – 12 kg 630 g = 10 kg 825 g.

Exercise 12.4

1. Walking distance to the library = 456 m.

    Walking distance to the stationary shop = 34 m.
    Walking distance to the grocery shop = 350 m 46 cm.
    Total walking distance = 456 m + 34 m + 350 m 46 cm
    So, he has walked 840 m 46 cm.

m	cm
456	00
34	00
+ 350	46
840	46

2. Weight of apples   =   2 kg   500 g
    Weight of grapes   =   1 kg   200 g
    Weight of mangoes   =   + 3 kg   400 g

    Weight of all fruits   =   7 kg   100 g

    So, he bought 7 kg 100 g of fruits.

3.

	l	ml
Quantity of milk sold in first day =	35	455
Quantity of milk sold in second day =	19	506
Quantity of milk sold in third day = +	29	700
	84	661

So, he has sold 84 l 661 ml in three days.

4.

Quantity of shampoo = 850̶ ml (¹⁴ 1̶ 1̶ 1̶0̶)

Quantity of shampoo used = − 267 ml

= 583 ml

So, 583 ml shampoo is left.

5.

Total length of rope =	345 m	66 cm
Length of rope used = −	267 m	15 cm
Length of rope left =	78 m	51 cm

So, 78 m 51 cm rope is left.

6.

Weight of watermelon =	3̶ kg (²)	823̶ g (¹⁴ 7̶ 12)
Weight of papaya = −	2 kg	750 g
		775 g

So, watermelon is heaviour by 775 g.

7.

Rice taken from one shop =	56 kg	500 g
Rice taken from another shop = +	48 kg	750 g
	105 kg	250 g

So, he bought 105 kg 250 g rice.

8. Total length of the wire = 600 m

Length of the wire sold to once customer = 55 m 65 cm

Length of the wire sold to another customer = 142 m 75 cm

Length of the wire sold =	55 m	65 cm
+	142 m	75 cm
	198 m	40 cm

Length of the wire left = 600 m − 198 m 40 cm

=	599 m	100 cm
−	198 m	40 cm
	401 m	60 cm

So, the length of the wire left was 401 m 60 cm.

MCQ's

1. (c) **2.** (b) **3.** (b) **4.** (c).

2. 11 m **3.** 7 m **4.** 2 m **5.** 5 m **6.** 5 m.

13. Money

Exercise 13.1

1. (a) Forty-three rupees seventy five paise.
   (b) Twenty-seven rupee fifty paise.
   (c) Seventy-five paise.
   (d) Three hundred fifteen rupees twenty-five paise.
   (e) Two hundred sixty-eight rupees fifty paise.
   (f) Hundred rupees twenty-five paise.
2. (a) 71.05 (b) 320.75 (c) 0.25 or 25 p (d) 530.65

Exercise 13.2

1. (a) ₹ 18.00

   $$₹\,1 = 100\,p$$
   $$₹\,18.00 = 18.00 \times 100\,p$$
   $$= 1800\,p$$

   (b) ₹ 16.50

   $$₹\,1 = 100\,p$$
   $$₹\,16.50 = 16.50 \times 100\,p$$
   $$= 1650.00\,p$$
   $$= 1650\,p$$

   (c) ₹ 68.25

   $$₹\,1 = 100\,p$$
   $$₹\,68.25 \times 100\,p = 68.25 \times 100\,p$$
   $$= 6825.00\,p$$
   $$= 6825\,p$$

   (d) ₹ 123.00

   $$₹\,1 = 100\,p$$
   $$₹\,123.00 \times 100\,p = 12300.00\,p$$
   $$= 12300\,p$$

   (e) ₹ 256.25

   $$₹\,1 = 100\,p$$
   $$₹\,256.25 = 256.25 \times 100\,p$$
   $$= 25625.00\,p$$
   $$= 25625\,p$$

   (f) ₹ 315.50

   $$₹\,1 = 100\,p$$
   $$₹\,315.50 = 315.50 \times 100\,p$$
   $$= 31550.00\,p$$
   $$= 31550\,p$$

   (g) ₹ 453.08

   $$₹\,1 = 100\,p$$
   $$₹\,453.08 = 453.08 \times 100\,p$$
   $$= 45308.00\,p$$
   $$= 45308\,p$$

   (h) ₹ 811.05

   $$₹\,1 = 100\,p$$
   $$₹\,811.05 = 811.05 \times 100\,p$$
   $$= 81105.00\,p$$
   $$= 81105\,p$$

2. (a) 825 p

   $$1\,p = \frac{₹\,1}{100}$$
   $$825\,p = ₹\,\frac{825}{100} = ₹\,8.25$$

   (b) 2500 p

   $$1\,p = ₹\,\frac{1}{100}$$
   $$2500\,p = ₹\,\frac{2500}{100} = ₹\,25$$

   (c) 3950 p

   $$1\,p = ₹\,\frac{1}{100}$$
   $$3950\,p = ₹\,\frac{3950}{100} = ₹\,39.50$$

   (d) 10250 p

   $$1\,p = ₹\,\frac{1}{100}$$
   $$10250\,p = ₹\,\frac{10250}{100} = ₹\,102.50$$

(e) 81 rupees 50 paise

$1 p = ₹\dfrac{1}{100}$

81 rupees 50 paise
= 81 rupees + 50 paise
$= ₹\,81 + ₹\,\dfrac{50}{100}$
$= ₹\,81 + ₹\,0.50 = ₹\,81.50$

(f) 95 rupees 55 paise

$1 p = ₹\dfrac{1}{100}$

95 rupees 55 paise
= 95 rupees + 55 paise
$= ₹\,95 + ₹\,\dfrac{55}{100}$
$= ₹\,95 + ₹\,0.55 = ₹\,95.55$

(g) 7645 p

$1 p = ₹\dfrac{1}{100}$

$7645\ p = ₹\,\dfrac{7645}{100} = ₹\,76.45$

(h) 800 p

$1 p = ₹\dfrac{1}{100}$

$8000\ p = ₹\,\dfrac{8000}{100} = ₹\,80$

Exercise 13.3

1. (a)

₹	p
65 .	50
+ 46 .	75
112 .	25

(b)

₹	p
49 .	50
+ 31 .	25
80 .	75

(c)

₹	p
78 .	75
+ 60 .	50
139 .	25

(d)

₹	p
84 .	50
+ 58 .	75
143 .	25

2. (a)
₹ 24.30
+ ₹ 37.50
₹ 61.80

(b)
₹ 28.25
+ ₹ 67.50
₹ 95.75

(c)
₹ 65.50
+ ₹ 87.50
₹153.00

(d)
₹501.30
+ ₹ 97.50
₹598.80

(e)
₹253.00
+ ₹ 93.50
₹346.50

(f)
₹107.30
+ ₹197.50
₹304.80

3. (a)

₹	p
76 .	70
− 35 .	00
41 .	70

(b)

₹	p
89 .	75
− 63 .	25
26 .	50

(c)

₹	p
80 .	00
− 69 .	25
10 .	75

(d)

₹	p
65 .	00
− 27 .	75
37 .	25

4. (a)
9 9
2 10 10 10
₹ 30.00
− ₹ 16.75
₹ 13.25

(b)
₹ 62.50
− ₹ 48.50
₹ 14.00

(c)
9 9
4 10 10 10
₹150.00
− ₹130.25
₹ 19.75

(d)
9
11 10 12
₹320.25
− ₹182.55
₹137.70

(e)
9 9 9
10 10 10 10
₹1000.00
− ₹ 780.90
₹ 219.10

(f)
9 9
8 10 10 13
₹ 900.30
− ₹ 708.50
₹ 191.80

5.
9 9
1 10 10 10
₹ 150.00
− ₹ 67.75
₹ 82.25

So, ₹ 82.25 should be added.

6.

Cost of chocolate cake	=	₹	630.50
Cost of toffees	= +	₹	58.75
		₹	689.25

So, she spent ₹ 689.25 in all.

7.

The money Shikha had	=	₹	4 0 0 . 0 0
Cost of the book	=	₹	1 2 5 . 0 0
Cost of the ice-cream	= +	₹	3 5 . 5 0
The money spent on both items	=	₹	1 6 0 . 5 0

			9 9
			$\cancel{4}\,\cancel{0}\,\cancel{0}$ 10
The money left	=	₹	$\cancel{4}\,\cancel{0}\,\cancel{0}\,.\,\cancel{0}\,0$
	−		1 6 0 . 5 0
		₹	2 3 9 . 5 0

So, ₹ 239.50 is left with her.

8.

Cost of the mobile phone	=	₹	9 5 0 0 . 0 0
The money as tax	= +	₹	2 1 8 . 5 0
The money he spent	=	₹	9 7 1 8 . 5 0

So, he spent ₹ 9718.50 in all to buy the mobile.

Exercise 13.4

1. ∵   Cost of 1 calculator = ₹   415.50

∴   Cost of 4 calculators = ₹   415.50

	× 4
₹	1662.00

So, the cost of 4 calculators is ₹ 1662.

2. Income per month = ₹ 11,175.50

One year = 12 months

The money earned in one year = ₹ 11,175.50 × 12 = ₹ 1,34,106

```
1 1 1 7 5 . 5 0
        × 1 2
  2 2 3 5 1 0 0
1 1 1 7 5 5 0 ×
1 3 4 1 0 6 . 0 0
```

So, he will earn ₹ 1,34,106 in one year.

3. ∵   Cost of 4 packets = ₹ 960.40

∴   Cost of 1 packet = ₹ 960.40 ÷ 4

= ₹ 240.10

So, the cost of each packet is ₹ 240.10.

```
        240.10
    4)  960.40
      − 8
        ───
        16
      − 16
        ───
         4
        −4
        ───
         ×
```

4.   ∵   Cost of 6 shirts = ₹ 1260.60
   ∴   Cost of 1 shirt = ₹ 1260.60 ÷ 6
                        = ₹ 210.10
   So, the cost of 1 shirt is ₹ 210.10.

```
        210.10
   6 ) 1260.60
      − 12
      ────
         6
       − 6
       ────
         06
        − 6
       ────
          ×
```

5.   ∵   Cost of 1 ball = ₹ 26.45
   ∴   Cost of 15 balls = ₹ 26.45 × 15
                      = ₹ 396.75
   So, the cost of 15 balls is ₹ 396.75.

```
     2 6 . 4 5
      × 1 5
   ───────────
   1 3 2 2 5
   2 6 4 5 ×
   ───────────
   3 9 6 . 7 5
```

Exercise 13.5

1.

Items	Quantity	Rate	Amount (₹)
Rice	7 kg	₹ 63.00	₹ 441.00
Oil	4 *l*	₹ 91.75	₹ 367.00
Eggs	10	₹ 3.45	₹ 34.50
Wheat	9 kg	₹ 9.25	₹ 83.25
		Grand Total	₹ 925.75

2.

Items	Quantity	Rate	Amount (₹)
Pizzas	16	₹ 95	₹ 1520
Cold drinks	7	₹ 16	₹ 112
Pastries	15	₹ 10	₹ 150
Burgers	7	₹ 18	₹ 126
		Grand Total	₹ 1908

MCQ's

1. (b) **2.** (a).

Worksheet

   a.   ₹ 500 ÷ 5 = ₹ 100   b.   ₹ 400 ÷ 8 = ₹ 50
   c.   ₹ 360 ÷ 6 = ₹ 60   d.   ₹ 490 ÷ 7 = ₹ 70

Formative Assessment-3

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

14. Time

Exercise 14.1

1. a. The short hand of the clock tells us the **hours**.
    b. The **long** hand of the clock tells us the minutes.
    c. An hour has **60** minutes.
    d. A minute has **60** seconds.
    e. In a day, the hour hand takes **2** rounds of the clock.
2.   2 : 10   3 : 40   9 : 30
        ten minutes past two   forty minutes past three   half past nine
3. (a) 05 : 30 a.m.   (b) 11 : 30 p.m.   (c) 4 : 15 p.m.   (d) 1 : 35 p.m.
4. (a) 9 : 40 p.m.   (b) 1 : 00 p.m.   (c) 3 : 20 p.m.   (d) 3 : 30 p.m.

Exercise 14.2

1. (a) 11 : 33   (b) 02 : 28   (c) 01 : 54   (d) 12 : 18
2. (a)   (b)   (c)   (d)
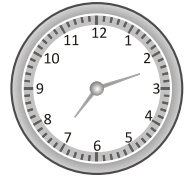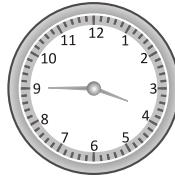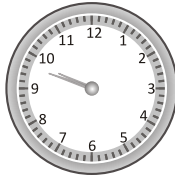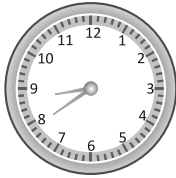
3. (a) → (iii) (b) → (iv) (c) → (i) (d) → (ii)

Exercise 14.3

1. (a) 0400 hours = 4 : 00 a.m.
    (b) 1530 hours = 1530 – 1200 = 3 : 30 p.m.
    (c) 2345 hours = 2345 – 1200 = 11 : 45 p.m.
    (d) 2135 hours = 2135 – 1200 = 9 : 35 p.m.
    (e) 1725 hours = 1725 – 1200 = 5 : 25 p.m.
    (f) 0535 hours = 5 : 35 a.m.
    (g) 0115 hours = 1 : 15 a.m.
    (h) 1348 hours = 1348 – 1200 = 1 : 48 p.m.
2. (a) 1 : 45 p.m. = 0145 + 1200 = 1345 hours
    (b) 6 : 10 a.m. = 0610 hours
    (c) 12 : 25 p.m. = 1225 hours
    (d) 9 : 15 p.m. = 0915 + 1200 = 2115 hours
    (e) 4 : 30 a.m. = 0430 hours
    (f) 5 : 40 p.m. = 0540 + 1200 = 1740 hours
    (g) 3 : 10 a.m. = 0310 hours
    (h) 10 : 45 p.m. = 1045 + 1200 = 2245 hours
3. a. **10 : 00 p.m.** is 12-hour clock time for 2200 hour.
    b. When it is 7:30 am, the time in a 24 hour-clock is **0730 hours**.
    c. A plane is scheduled to arrive at 2120 hour. Its arrival time in a wrist watch is **09 : 20 p.m**.

Exercise 14.4

1. (a) 5 hours
1 hour = 60 min
5 hours = 5 × 60 min = 300 min.

(b) 11 hours
1 hour = 60 min
11 hours = 11 × 60 = 660 min.

(c) 4 and a half hours
$$= 4\frac{1}{2} \text{ hours}$$
1 hour = 60 min
$$4\frac{1}{2} \text{ hours} = \frac{9}{2} \text{ hours} = \frac{9}{2} \times 60 \text{ min}$$
$$= 9 \times 30 \text{ min} = 270 \text{ min.}$$

(d) 7 hours and a quarter of an hour
$$= 7\frac{1}{4} \text{ hours}$$
1 hour = 60 min
$$7\frac{1}{4} \text{ hours} = \frac{29}{4} \text{ hours} = \frac{29}{4} \times 60 \text{ min}$$
$$= 29 \times 15 = 435 \text{ min.}$$

(e) 9 hours = 40 min
1 hour = 60 min
1 hours 40 min = 9 hours + 40 min
$$= 9 \times 60 \text{ min} + 40 \text{ min}$$
$$= 540 \text{ min} + 40 \text{ min}$$
$$= 580 \text{ min.}$$

(f) 8 hours 55 min = 8 hours + 55 min
$$= 8 \times 60 \text{ min} + 55 \text{ min}$$
$$= 480 \text{ min} + 55 \text{ min}$$
$$= 535 \text{ min.}$$

2. (a) 400 min
$$1 \text{ min} = \frac{1}{60} \text{ hours}$$
400 min = 40 ÷ 60 hours
$$= 6 \text{ hours } 40 \text{ min.}$$

```
        6 hours
60 ) 400
    − 360
      40 min
```

(b) 1276 min
$$1 \text{ min} = \frac{1}{60} \text{ hours}$$
1276 min = 1276 ÷ 60 min
$$= 21 \text{ hours } 16 \text{ min.}$$

```
       21 hours
60 ) 1276
   − 120
      76
    − 60
      16  min
```

(c) 986 min
$$1 \text{ min} = \frac{1}{60} \text{ hours}$$
986 min = 986 ÷ 60
$$= 16 \text{ hours } 26 \text{ min}$$

```
       16 hours
60 ) 986
   − 60
     386
   − 360
      26  min
```

(d) 3485 min
$$1 \text{ min} = \frac{1}{60} \text{ hours}$$
3485 min = 3485 ÷ 60 hours
$$= 58 \text{ hours } 5 \text{ min.}$$

```
       58 hours
60 ) 3485
   − 300
     485
   − 480
       5 min
```

(e) 891 min
$$1 \text{ min} = \frac{1}{60} \text{ hours}$$
891 min = 891 ÷ 60
$$= 14 \text{ hours } 51 \text{ min.}$$

```
       14 hours
60 ) 891
   − 60
     291
   − 240
      51  min
```

(f) 2007 min
$$1 \text{ min} = \frac{1}{60} \text{ hours}$$
2007 min = 2007 ÷ 60
$$= 33 \text{ hours } 27 \text{ min.}$$

```
       33 hours
60 ) 2007
   − 180
     207
   − 180
      27  min
```

3. **(a)** 8 min 15 sec
1 min = 60 sec
8 min 15 sec = 8 min + 15 sec
$= 8 \times 60\,\text{sec} + 15\,\text{sec}$
$= 480\,\text{sec} + 15\,\text{sec}$
$= 495\,\text{sec}.$

(b) 2 minute
1 min = 60 sec
$2\,\text{min} = 2 \times 60\,\text{sec}$
$= 120\,\text{sec}.$

(c) A minute and a half
1 min = 60 sec
A minute and a half
$= 1\dfrac{1}{2}\,\text{min} = \dfrac{3}{2}\,\text{min}.$
$= \dfrac{3}{2} \times 60\,\text{sec}$
$= 3 \times 30\,\text{sec} = 90\,\text{sec}.$

(d) 5 min and a quarter of min
1 min = 60 sec
5 min and a quarter of min
$= 5\dfrac{1}{4}\,\text{min} = \dfrac{21}{4}\,\text{min}.$
$= \dfrac{21}{4} \times 60\,\text{sec}.$
$= 21 \times 15 = 315\,\text{sec}.$

(e) 6 min and 20 seconds
1 min = 60 sec
6 min and 20 seconds
$= 6 \times 60\,\text{sec} + 20\,\text{sec}$
$= 360\,\text{sec} + 20\,\text{sec}$
$= 380\,\text{sec}.$

(f) 2 hours
1 hour $= 60 \times 60\,\text{sec} = 3600\,\text{sec}.$
2 hours $= 2 \times 3600\,\text{sec}$
$= 7200\,\text{sec}.$

4. **(a)** 245 seconds
$1\,\text{sec} = \dfrac{1}{60}\,\text{min}$
$245\,\text{sec} = 245 \div 60\,\text{min}$
$= 4\,\text{min}\ 5\,\text{sec}.$

```
        4 min
  60 ) 245
      − 240
        5   sec
```

(b) 1485 seconds
$1\,\text{sec} = \dfrac{1}{60}\,\text{min}$
$1485\,\text{sec} = 1485 \div 60$
$= 24\,\text{min}\ 45\,\text{sec}.$

```
        24 min
  60 ) 1485
      − 120
        285
      − 240
        45   sec
```

(c) 872 seconds
$1\,\text{sec} = \dfrac{1}{60}\,\text{min}$
$872\,\text{sec} = 872 \div 60\,\text{min}$
$= 14\,\text{min}\ 32\,\text{sec}.$

```
        14 min
  60 ) 872
      − 60
        272
      − 240
        32   sec
```

(d) 1200 seconds
$1\,\text{sec} = \dfrac{1}{60}\,\text{min}$
$1200\,\text{sec} = 1200 \div 60\,\text{min}$
$= 20\,\text{min}.$

```
        20 min
  60 ) 1200
      − 120
        ×
```

(e) 7760 seconds
$1\,\text{sec} = \dfrac{1}{60}\,\text{min}$
$7760\,\text{sec} = 7760 \div 60\,\text{min}$
$= 129\,\text{min}\ 20\,\text{sec}.$

```
        129 min
  60 ) 7760
      − 60
        176
      − 120
        560
      −540
        20   sec
```

(f) 440 seconds

$1 \text{ sec} = \dfrac{1}{60} \text{ min}$

$440 \text{ sec} = 440 \div 60 \text{ min}$

$= 7 \text{ min } 20 \text{ sec.}$

$$\begin{array}{r} 7 \text{ min} \\ 60\overline{)\,440} \\ -420 \\ \hline 20 \quad \text{sec} \end{array}$$

Exercise 14.5

1. (a) 12.00 noon to 3.00 p.m. = 3 hours
    (b) 1 : 40 a.m. to 8.00 a.m. = 1 : 40 a.m. to 2 : 00 a.m. + 2 : 00 a.m. to 8 a.m.
    $\qquad\qquad\qquad\qquad$ = 20 min + 6 hours = 6 hours 20 min.
    (c) 11 : 45 a.m. to 7 : 30 p.m.
    $\qquad\qquad\qquad$ = 11 : 45 a.m. to 12.00 noon + 12.00 noon to 7 : 30 p.m.
    $\qquad\qquad\qquad$ = 15 min + 7 hours 30 min = 7 hours 45 min.
    (d) 8 : 00 a.m. to 1.00 p.m. = 8.00 a.m. to 12.00 noon + 12 : 00 noon to 1.00 p.m.
    $\qquad\qquad\qquad\qquad$ = 4 hours + 1 hours = 5 hours

2. (a) 10 : 45 p.m. to 11 : 00 p.m. = 20 min
    (b) 11 : 45 p.m. to 1 : 30 a.m.
    $\qquad\qquad\qquad$ = 11 : 45 p.m. to 12 : 00 noon + 12 : 00 noon to 1 : 30 a.m.
    $\qquad\qquad\qquad$ = 15 min + 1 hour 30 min = 1 hour 45 min = 60 min + 45 min
    $\qquad\qquad\qquad$ = 105 min.
    (c) 7 : 30 a.m. to 8 : 15 a.m.
    $\qquad\qquad\qquad$ = 7 : 30 a.m. to 8 : 00 a.m. + 8.00 a.m. to 8.15 a.m.
    $\qquad\qquad\qquad$ = 30 min + 15 min = 45 min.
    (d) 3 o'clock to quarter to four = 45 min.

3. Starting time = 7 : 30 a.m.
    Ending time = 1 : 40 p.m.
    Time duration = 7 : 30 a.m. to 1 : 40 p.m.
    $\qquad$ = 7 : 30 a.m. to 8.00 a.m. + 8.00 a.m. to 12.00 noon + 12.00 noon to 1.00 p.m.
    $\qquad\qquad\qquad\qquad\qquad\qquad$ + 1.00 p.m. to 1 : 40 p.m.
    $\qquad$ = 30 min + 4 hours + 1 hour + 40 min
    $\qquad$ = 5 hours 70 min = 6 hours 10 min.
    So, the duration of his school is 6 hours 10 min.

4. Ragini goes at = 9 : 20 a.m.
    She comes back at = 5 : 40 p.m.
    Time duration = 9 : 20 a.m. to 5 : 40 p.m.
    = 9 : 20 a.m. to 10 : 00 a.m. + 10 : 00 a.m. to 5 : 00 p.m. + 5 : 00 p.m. to 5 : 40 p.m.
    = 40 min + 7 hours + 40 min
    = 7 hours 80 min
    = 8 hours 20 min
    So, the duration of her office is 8 hours 20 min.

5. Aarush goes to bed at = 10 : 30 p.m.
    He gets up to = 6 : 40 a.m.
    Time duration = 10 : 30 p.m. to 6 : 40 a.m.
    = 10 : 30 p.m. to 11 : 00 p.m. + 11 : 00 p.m. to mid night + midnight to 6 : 00 a.m.
    $\qquad\qquad\qquad\qquad\qquad\qquad$ + 6 : 00 a.m. to 6 : 40 a.m.
    = 30 min + 1 hour + 6 hours + 40 min
    = 7 hours 70 min = 8 hours 10 min
    So, he sleeps till 8 hours 10 min.

Exercise 14.6

1. (a)

Hours	min
¹	
2	3 5
+ 1	2 5
4	0 0

∴   2 hours 35 min + 1 hour 25 min
         = 4 hours

(b)

Hours	min
¹	
7	1 8
+ 7	5 6
12	1 4

∴   4 hours 18 min + 7 hour 56 min
         = 12 hours 14 min

(c)

Hours	min
¹	
9	3 8
+ 6	2 8
1 6	0 6

∴   9 hours 38 min + 6 hours 15 min
         = 16 hours 6 min

(d)

Hours	min
7	3 2
+ 6	2 4
1 3	5 6

∴   9 hours 32 min + 6 hours 24 min
         = 13 hours 56 min.

(e)

Hours	min
¹	
1 0	5 0
+ 6	1 5
1 7	0 5

∴   10 hours 50 min + 6 hours 15 min
         = 17 hours 5 min

(f)

Hours	min
¹	
8	3 4
+ 1 2	3 4
2 1	0 8

∴   8 hours 34 min + 12 hours 34 min
         = 21 hours 8 min.

2. (a)

Hours	min
4	60 + 06 = 66
5̶	0̶6̶
− 1	3 4
3	3 2

∴   5 hours 6 min − 1 hour 34 min
         = 3 hours 32 min

(b)

Hours	min
5	33 + 60 = 93
6̶	3̶3̶
− 3	5 4
2	3 9

∴   6 hours 33 min − 3 hours 54 min
         = 2 hours 39 min

(c)

Hours	min
17	22 + 60 = 82
1̶8̶	2̶2̶
− 1 4	4 5
3	3 7

∴   18 hours 22 min − 14 hour 45 min
         = 3 hours 37 min

(d)

Hours	min
11	15 + 60 = 75
1̶2̶	1̶5̶
− 6	5 5
5	2 0

∴   12 hours 15 min − 6 hours 55 min
         = 5 hours 20 min

(e)

Hours	min
13	18 + 60 = 78
1̶4̶	1̶8̶
− 9	3 2
4	4 6

∴   14 hours 1 min − 9 hours 32 min
         = 4 hours 46 min

(f)

Hours	min
11	23 + 60 = 83
1̶9̶	2̶3̶
− 1 5	3 5
3	4 8

∴   19 hours 23 min − 15 hours 35 min
         = 3 hours 48 min

Exercise 14.7

1. Raining time on the first day = 2 hours 50 minutes
   Raining time on the second day = 3 hours 30 minutes
   Raining time on the third day = 2 hours 40 minutes
   Total raining time

Hours	min
2	5 0
+ 3	3 0
+ 2	4 0
7	1 2 0

   = 7 hours 120 min = 9 hours

   So, it rained 9 hours in all.

2. Duration of a movie = 2 hours 30 minutes
   Duration of first half = 55 minutes
   Duration of second half = 2 hours 30 minutes – 55 minutes = 1 hour 35 minutes

Hours	min
1	30 + 60 = 90
$\cancel{2}$	$\cancel{30}$
– 0	5 5
1	3 5

   So, the duration of the second half was 1 hour 35 minutes.

3. Arrival time = 5 : 20 p.m.
   It was late by = 3 hours 45 minutes
   The train arrived at = 5 : 20 p.m. + 3 hours + 45 minutes
   = 8 : 20 p.m. + 45 minutes = 9 : 05 p.m.
   So, the train arrived at 9 : 05 p.m.

4. Show began at = 7 : 00 p.m.
   Show ended at = 8 : 40 p.m.
   The duration of the show = 7 : 00 p.m. to 8 : 40 p.m. = 1 hour 40 min
   So, the duration of the show was 1 hour 40 min.

5. Time taken by bus = 9 hours 30 minutes
   Time taken by car = 6 hours 45 minutes
   Time taken longer by = 9 hours 30 minutes – 6 hours 45 minutes
   = 2 hours 45 minutes
   So, the journey by bus is longer by 2 hours 45 minutes.

Hours	min
8	30 + 60 = 90
$\cancel{9}$	$\cancel{30}$
– 6	4 5
2	4 5

Exercise 14.8

1. (a)
   $$4) \overline{1952} \ (488$$

   ```
         488
   4) 1952
     − 16
     ─────
        35
      − 32
     ─────
        32
      −32
     ─────
         ×
   ```

   (b)
   ```
         501
   4) 2005
     − 20
     ─────
        05
      − 4
     ─────
         1
   ```

   ∴ 1952 is exactly divisible by 4,
   ∴ 1952 is a leap year.

   ∵ 2005 is not exactly divisible by 4,
   ∴ 2005 is not a leap year.

(c)

$$\begin{array}{r} 502 \\ 4\overline{)2010} \\ -20 \\ \hline 10 \\ -8 \\ \hline 2 \end{array}$$

∵ 2010 is not exactly divisible by 4,
∴ 2010 is not a leap year.

(d)

$$\begin{array}{r} 503 \\ 4\overline{)2014} \\ -20 \\ \hline 14 \\ -12 \\ \hline 2 \end{array}$$

∵ 2014 is not exactly divisible by 4,
∴ 2014 is not a leap year.

(e)

$$\begin{array}{r} 499 \\ 4\overline{)1998} \\ -16 \\ \hline 39 \\ -36 \\ \hline 38 \\ -36 \\ \hline 2 \end{array}$$

∵ 1998 is not exactly divisible by 4,
∴ 1998 is not a leap year.

(f)

$$\begin{array}{r} 530 \\ 4\overline{)2120} \\ -20 \\ \hline 12 \\ -12 \\ \hline \times \end{array}$$

∵ 2120 is exactly divisible by 4,
∴ 2120 is a leap year.

(g)

$$\begin{array}{r} 503 \\ 4\overline{)2012} \\ -20 \\ \hline 12 \\ -12 \\ \hline \times \end{array}$$

∵ 2012 is exactly divisible by 4,
∴ 2012 is a leap year.

(h)

$$\begin{array}{r} 494 \\ 4\overline{)1976} \\ -16 \\ \hline 37 \\ -36 \\ \hline 16 \\ -16 \\ \hline \times \end{array}$$

∵ 1976 is exactly divisible by 4,
∴ 1976 is a leap year.

2. (a) 6 months
        1 month = 30 days
        6 months = 6 × 30 = 180 days
    (b) February + March + October
        No. of days in February = 28 days
        No. of days in March = 31 days
        No. of days in October = 31 days
        Total days = 28 + 31 + 31
                  = 28 + 62 = 90 days
    (c) 7 weeks + 4 days
        1 week = 7 days
        7 weeks + 4 days = 7 × 7 days + 4 days
                        = 49 days + 4
                        = 53 days

(d) June + 2 weeeks + 20 days

No. of days in June $= 30\,$days

and 1 week $= 7\,$days

$\therefore$ June + 2 weeks + 20 days $= 30$ days $+ 2 \times 7$ days $+ 20$ days

$\qquad\qquad\qquad\qquad\qquad\qquad = 30$ days $+ 14$ days $+ 20$ days $= 64$ days

3. (a) 2 days

1 day $= 24$ hours

2 days $= 2 \times 24$ hours $= 48$ hours

(b) half a day

1 day $= 24$ hours

half a day $= \dfrac{1}{2}$ day

$\qquad\qquad = \dfrac{1}{2} \times 24$ hours $= 12$ hours

(c) 3 and a half days

1 day $= 24$ hours

3 and a half days $= 3\dfrac{1}{2}$ days $= \dfrac{7}{2}$ days

$\qquad\qquad\qquad\quad = \dfrac{7}{2} \times 24$ hours $= 7 \times 12$ hours $= 84$ hours

(d) 1 week and a quarter day

$\qquad$ 1 week $= 7\,$days

and $\qquad$ 1 day $= 24$ hours

$\therefore$ 1 week and 1 quarter day $= 7\,$days $+ \dfrac{1}{4}$ day

$\qquad\qquad\qquad\qquad\qquad = 7\dfrac{1}{4}$ days $= \dfrac{29}{4}$ days

$\qquad\qquad\qquad\qquad\qquad = \dfrac{29}{4} \times 24$ hours

$\qquad\qquad\qquad\qquad\qquad = 29 \times 6$ hours $= 174$ hours

4. Number of days $= 42\,$days

$\qquad\qquad\qquad = 42 \div 7\,$weeks $\qquad\qquad\qquad\qquad \left(\because 1\text{day} = \dfrac{1}{7}\,\text{week} \right)$

$\qquad\qquad\qquad = 6$ weeks

So, he does have holiday for 6 weeks.

5. Number of days of training $= 12\,$days $= 12 \times 24$ hours $\qquad (\because 1$ day $= 24$ hours)

$\qquad\qquad\qquad\qquad\qquad\quad = 288$ hours

So, it lasted for 288 hours.

6. Number of days from 4th July, 2002 to 31st July 2002 $= 30 - 4 + 1$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad = 32 - 4 = 28\,$days

Number of remaining month of 2002 $= 5\,$months

Number of years from 2003 to 2011 $= 2011 - 2003 + 1 = 8 + 1 = 9\,$years

Number of months and days from 1 Jan, 2012 to 29th March 2012 $= 2\,$months 29 days

Total time period $= 28$ days $+ 5$ months $+ 9$ years $+ 2$ months 29 days

$\qquad\qquad\qquad = 9$ years 7 months 57 days $= 9$ years 8 months 27 days

So, she studied in the school for 9 years 8 months 27 days.

7. Joining date = 9th January
Number of working days = 20 days
Leaving date = 20 + 9 − 1 = 28 th January
So, John has left the office on 28 th January.

MCQ's

1. (c) **2.** (c) **3.** (c) **4.** (a)

Worksheet

Venue A		Venue B		Venue C	
Starting 16th April for 21 days	Finishing date **6 May**	Starting 20th May for 18 days	Finishing date **6 June**	Starting 12th June for 23 days	Finishing date **4 July**
Daily form : 10:30 a.m. to 3 : 10 a.m.	Duration of each day **4 hours 40 min**	Daily from : 9:40 a.m. to 2:20 p.m.	Duration of each day **4 hours 40 min**	Daily form : 10 : 45 a.m. to 2:55 p.m.	Duration of each day **4 hours 10 min**

15. Geometry

Exercise 15.1

1.   (a) O   (b) C   (c) C   (d) O

2.

Shape	Number of faces	Number of edges	Number of vertices
Cube	6	**12**	8
Cuboid	**6**	12	**8**
Cone	2	1	1
Sphere	**1**	**0**	0
Cylinder	3	**0**	**0**

3.   a.   A sphere has **no** vertices.
   b.   A triangle has **3** sides.
   c.   There are **2** diagonals in a rectangle.

Exercise 15.2

1.   (a) $\overline{PQ}$ is a ray.   (b) $\overleftrightarrow{AB}$ is a line.   (c) $\overline{AB}$ is a line segment.

2.   (a) 3.3 cm   (b) 8.9 cm

3.   (a) A———————B   (b) A———————B
                    7.8 cm   5.2 cm

   (c) A———————B   (d) A———————B
                    7.8 cm   4.7 cm

4.   We can find 6 rays. These are $\overrightarrow{RQ}, \overrightarrow{SQ}, \overrightarrow{TQ}, \overrightarrow{RP}, \overrightarrow{SP}$ and $\overrightarrow{TP}$.

5. (a) There are 4 line segments. These are AB, BC, CD and DA.

    (b) There are 3 line segment. These are PQ, QR and RP.

    (c) There are 6 line segments. These are LM, MN, NO, OP, PQ, QR and RL.

Exercise 15.3

1. (a) $\angle ABC$ (b) $\angle ONM$ (c) $\angle XYZ$

2. (a) Arms are BC and BA. Vertex is B.

    (b) Arms are MN and ML. Vertex is M.

    (c) Arms are YX and YZ. Vertex is Y.

3. (a) Exterior points are P and Z.   (b) Interior points are X and Y.

Exercise 15.4

1. (a) ✗   (b) ✔   (c) ✗   (d) ✔

    (e) ✔   (f) ✗   (g) ✗   (h) ✔

2. (a) False   (b) True   (c) True   (d) False

    (e) True

Exercise 15.5

1. (i) Sides are AB, BC and CA.

    (ii) Vertices are A, B and C.

    (iii) Angles are $\angle ABC, \angle BCA$ and $\angle CAB$.

2. (a) Equilateral triangle

    (b) Scalene triangle

    (c) Isosceles triangle.

Exercise 15.6

1. Do yourself.

2. (a) Centre of the circle is O.   (b) Radii of the circle are OP and OQ.

    (c) Chords of the circle LM and PQ.   (d) Diameter of the circle is PQ.

3. (a)   (b)
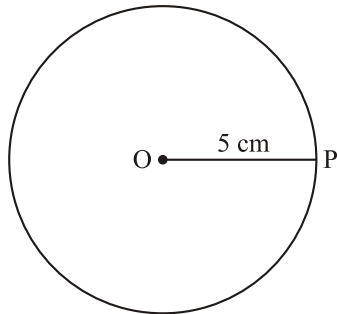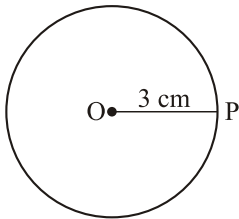
Exercise 15.7

1. (a) Radius $= 28$ cm   (b) Radius $= 12$ cm.

           Diameter $= 2 \times$ radius   Diameter $= 2 \times$ radius

                     $= 2 \times 28 = 56$ cm. $= 2 \times 12 = 24$ cm.

    (c) Radius $= 19$ cm

           Diameter $= 2 \times$ radius

                     $= 2 \times 19 = 38$ cm.

2. (a) Diameter = 40 cm

      Radius = $\dfrac{\text{diameter}}{2}$

            = $\dfrac{40}{2}$ = 20 cm

(b) Diameter = 58 cm

      Radius = $\dfrac{\text{diameter}}{2}$

            = $\dfrac{58}{2}$ = 29 cm.

(c) diameter = 80 cm.

      Radius = $\dfrac{\text{diameter}}{2}$ = $\dfrac{80}{2}$ = 40 cm.

3. (a) Girl   (b) T-shirt   (c) House

    (d) Rabbit   (e) Rocket

MCQ's

1. (b) **2.** (c) **3.** (a) **4.** (c).

16. Perimeter and Area

Exercise 16.1

1. (a) Perimeter = 5 + 5 + 5 = 15 cm.

    (b) Perimeter = 6 + 6 + 6 + 4 + 4 = 26 cm.

    (c) Perimeter = 4 + 8 + 4 + 4 + 8 + 4 = 32 cm.

2. (a) length (l) = 4 cm.,

      breadth (b) = 3 cm.

      Perimeter of rectangle = $2(l + b)$ = $2(4 + 3)$

                          = 2×7 = 14 cm.

    (b) length (l) = 10 cm,

      breadth (b) = 5 cm

      Perimeter of rectangle = $2(l + b)$ = $2(10 + 5)$

                          = 2×15 = 30 cm.

    (c) length (l) = 15 m,

      breadth (b) = 10 m

      Perimeter of rectangle = $2(l + b)$ = $2(5 + 10)$

                          = 2×25 = 50 cm.

    (d) length (l) = 7 km,

      breadth (b) = 5 km.

      Perimeter of rectangle = $2(l + b)$ = $2(7 + 5)$

                          = 2×12 = 24 km.

3. (a) Side of the square = 4 cm.

      Perimeter of the square = $4 \times$ side = 4×4 cm = 16 cm.

    (b) Side of the square = 10 cm.

      Perimeter of the square = $4 \times$ side = 4×10 = 40 cm.

    (c) Side of the square = 20 m

      Perimeter of the square = $4 \times$ side = 4×20 = 80 m.

    (d) Side of the square = 5 km.

      Perimeter of the square = $4 \times$ side = 4×5 = 20 km.

4. (a) Perimeter of the square $= 100$ cm.

Side of the square $= \dfrac{\text{Perimeter}}{4} = \dfrac{100}{4} = 25$ cm.

(b) Perimeter of the square $= 64$ cm.

Side of the square $= \dfrac{\text{Perimeter}}{4} = \dfrac{64}{4} = 16$ cm.

(c) Perimeter of the square $= 128$ m.

Side of the square $= \dfrac{\text{Perimeter}}{4} = \dfrac{128}{4} = 32$ m.

(d) Perimeter of the square $= 140$ m.

Side of the square $= \dfrac{\text{Perimeter}}{4} = \dfrac{140}{4} = 35$ m.

5. Length of the rectangle $= 18$ cm.

Breadth of the rectangle $= 6$ cm.
Perimeter of the rectangle $= 2(l+b) = 2(18+6) = 2 \times 24 = 48$ cm.
So, the perimeter is 48 cm.

6. Perimeter of the square $= 40$ cm.

Side of the square $= \dfrac{\text{Perimeter}}{4} = \dfrac{40}{4} = 10$ cm.

So, the length of each side is 10 cm.

7. Sides of the traingle be 15 inches, 18 inches and 17 inches.
Perimeter of the triangle $= 15 + 18 + 17 = 50$ inches

8. Perimeter of the pentagon $= 100$ m.

Length of the pentagon $= \dfrac{\text{Perimeter}}{5} = \dfrac{100}{5} = 20$ m.

So, length of each side is 20 m.

9. Length of the bedspread $= 3$ m.

Breadth of the bedspread $= 2$ m.
Perimeter of the bedspread $= 2(l+b) = 2(3+2) = 2 \times 5 = 10$ m
So, 10 m of lace is needed.

10. Length of the rectangular park $= 96$ m.

Breadth of the rectangular park $= 64$ m.
Perimeter of the rectangular park $= 2(l+b) = 2(96+64)$
$$= 2 \times 160 = 320 \text{ m.}$$

∵ Cost of fencing per m. $= ₹ 4$
∴ Cost of fencing 320 m. $= ₹ 4 \times 320 = ₹ 1280$
So, the length of the wire needed to fence all around the park is 320 m. and the cost of fencing it is ₹ 1280.

Exercise 16.2

1. (a) Red, Blue   (b) Blue, Red   (c) Blue, Red

2. (a) 5 cm^2 (b) 12 cm^2 (c) 18 cm^2

    (d) 9 cm^2 (e) 8 cm^2 (f) 13 cm^2

    (g) 13 cm^2 (h) 5 cm^2 (i) 6 cm^2

Exercise 16.3

1. (a) Area of the square = side × side = $6 \times 6 = 36 \, \text{cm}^2$

   (b) Area of rectangle = $l \times b = 6 \times 4 = 24 \, \text{cm}^2$

   (c) Area of rectangle = $l \times b = 10 \times 4 = 40 \, \text{cm}^2$

2. (a) Side of the square = 7 cm.

   Area of the square = $7 \times 7 = 49 \, \text{cm}^2$

   (b) Side of the square = 11 m.

   Area of the square = $11 \times 11 = 121 \, \text{m}^2$

   (c) Side of the square = 20 m

   Area of the square = $20 \times 20 = 400 \, \text{m}^2$

   (d) Side of the square = 16 m.

   Area of the square = $16 \times 16 = 256 \, \text{m}^2$

3. (a) $L = 6$ cm, $B = 2$ cm.

   Area of the rectangle = $L \times B = 6 \times 2 = 12 \, \text{cm}^2$

   (b) $L = 15$ cm, $B = 8$ cm.

   Area of the rectangle = $L \times B = 15 \times 8 = 120 \, \text{cm}^2$

   (c) $L = 16$ km, $B = 12$ m.

   Area of the rectangle = $L \times B = 16 \times 12 = 192 \, \text{m}^2$

   (d) $L = 9$ m, $B = 10$ m.

   Area of the rectangle = $L \times B = 9 \times 10 = 90 \, \text{m}^2$

4. Length of the rectangular plot = 12 m.

   Breadth of the rectangular plot = 24 m.

   Area of the rectangular plot = $l \times b = 12 \times 24 = 288 \, \text{m}^2$

   So, 288 m^2 are a will be covered by a rectangular plot.

5. Side of the square rug = 8 m.

   Area of the square rug = side × side = $8 \times 8 = 64 \, \text{m}^2$

   So, it will cover 64 m^2 area of the floor.

6. Length of the rectangular room = 8 m.

   Breadth of the rectangular room = 6 m.

   Area of the retangular room = $l \times b = 8 \times 6 = 48 \, \text{m}^2$

   So, area of the rectangular room is 48 m^2.

   ∵ Cost of tiling the room per m^2 = ₹ 15

   ∴ Cost of tiling the room 48 m^2 = ₹ 15×48 = ₹ 720

   So, the total cost of tiling the room will be ₹ 720.

MCQ's

1. (c) **2.** (b) **3.** (a) **4.** (c).

Worksheet

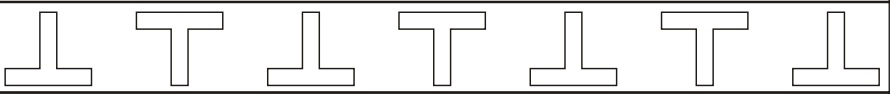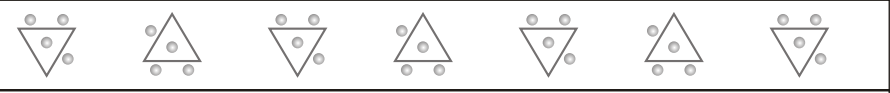1. Perimeter of picture = $5.8 + 5.8 + 5.8 + 5.8 = 23.2$ cm.

2. Perimeter of picture = $7.4 + 4.8 + 7.4 + 4.8 = 24.4$ cm.

3. Perimeter of picture $= 8.2 + 6.4 + 8.2 + 6.4 = 29.2$ cm.

4. Perimeter of picture $= 3 + 3 + 3 + 3 = 12$ cm.

  (a) Area of triangle $= \dfrac{1}{2} \times$ base $\times$ height

  (b) Area of square $=$ side $\times$ side

  (c) Area of rectangle $=$ length $\times$ breadth

17. Pattern

Exercise 17.1

1.

Exercise 17.2
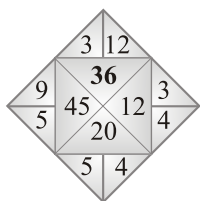
1. (a) $5 + 4 = 9$ $17 + 4 = 21$
        $9 + 4 = 13,$ $21 + 4 = 25$
        $13 + 4 = 17,$ $25 + 4 = 29$
        So, the pattern is 5, 9, 13, 17, 21, 25, 29.

     (b) $3 \times 3 = 9,$ $81 \times 3 = 243$
        $9 \times 3 = 27,$ $243 \times 3 = 729$
        $27 \times 3 = 81,$ $729 \times 3 = 2187$
        So, the pattern is 3, 9, 27, 81, 243, 729, 2187.

2. (a)

$1 + 2 = 3$

$2 + 3 = 4$

$3 + 4 = 7$

$3 + 5 = 8$

$5 + 7 = 12$

$\therefore \quad 8 + 12 = 20$

     (b)

$3 \times 4 = 12$

$4 \times 5 = 20$

$9 \times 5 = 45$

$\therefore \quad 3 \times 12 = 36$

(c)

$7 \times 2 = 14$
$11 \times 2 = 22$
$\therefore \quad 18 \times 2 = 36$

(d)

$36 \div 12 = 3$
$12 \div 4 = 3$
$\therefore \quad 3 \div 3 = 1$

(e)

$49 - 26 = 23$
$26 - 16 = 10$
$16 - 8 = 8$
$23 - 10 = 13$
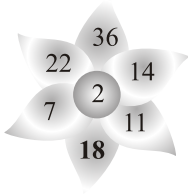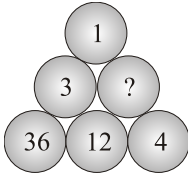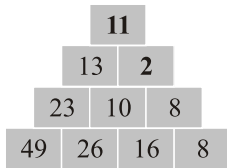$\therefore \quad 10 - 8 = 2 \text{ and } 13 - 2 = 11$

3. (a) $(45 \times 45) - (44 \times 44) = \mathbf{45 + 44}$
    (b) $(94 \times 94) - (93 \times 93) = \mathbf{94 + 93}$
    (c) $(115 \times 115) - (114 \times 114) = \mathbf{115 + 114}$
    (d) $(219 \times 219) - (218 \times 218) = \mathbf{219 + 218}$

MCQ's

1. (b) **2.** (a) **3.** (b).

Worksheet

(a) $2 + 12 = 22 = 36$
(b) $12 + 15 = 27$
(c) $5 + 10 + 15 + 20 + 25 = 75$
(d) $16 + 20 = 36$
(e) $36 + 25 = 61$
(f) $6 + 4 + 24 = 34$

18. Data Handling

Exercise 18.1

1. (a) Maths is liked most.
    (b) 30 students like EVS.
    (c) 35 students like English.
    (d) The total number of students are 130.
2. (a) Cartoons is most popular programme.
    (b) Sports is more popular programme than movie.
    (c) 25 children watch the news.
3. (a) The minimum number of car were sold in the month of May.
    (b) Number of cars sold in June $= 9 \times 10 = 90$ cars
        Number of cars sold in April $= 5 \times 10 = 50$ cars
        Number of more cars sold in June $= 90 - 50 = 40$ cars.
        So, 40 cars were sold in June than in April.

(c) $4 \times 10 = 40$ cars were sold in January.

(d) $29 \times 10 = 290$ cars were sold by the showroom in 6 months.

Exercise 18.2

1. (a) Bar graph represents the various activities in which students participated during the sports week.

   (b) Sacrace was the most popular activity. 60 students participated in this activity.

   (c) 35 students took part in hockey.

   (d) Total students $= 40 + 60 + 50 + 30 + 35 = 215$
   So, 215 students participated in various activities.

2.

Programme	Number of children
Cartoons	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
Sports	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺
News	☺ ☺ ☺ ☺ ☺
Serials	☺ ☺ ☺ ☺ ☺ ☺
Movies	☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺

   (a) The bar graph represents the animals in the zoo.

   (b) There are 10 lions in the zoo.

   (c) Monkey is maximum in the number.

   (d) There are 30 elephants in the zoo.

   (e) Total number of animals $= 10 + 30 + 80 + 40 + 10 + 20 = 190$ animals
   So, there are 190 animals in the zoo.

MCQ's

1. (a) **2.** (c) **3.** (c)

Worksheet

1. The bar graph represents the eatery charges of the hot dog.

2. Sugar and spice eatery charges maximum for a hot dog and it is ₹ 70.

3. Cost of the most expensive hot dog = ₹ 70
   Cost of the least expensive hot dog = ₹ 25
   Difference between their costs = ₹ 70 – ₹ 25 = ₹ 45
   So, the difference of cost between the most expensive and the least expensive hot dog is ₹ 45.

4. The most common price for a hot dog is ₹ 65.

5. Nirula's, Bistro and hot breads eateries sell it for the same price.

Formative Assessment-4

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

Summative Assessment-2

1. a. $\dfrac{3}{8}$ and $\dfrac{7}{8}$ are **like** fractions.

   b. $20 + 3 + 0.3 + 0.04$ is the expanded form of **23.34**.

   c. $1 \, l = $ **1000** ml

   d. perimeter of a square with side 5 cm is **20 cm**.

2. (a) $\dfrac{9}{10} + \dfrac{7}{11}$

   Multiples of 10 = 10, 20,.... 90, 100, ⬤110 ,....

   Multiples of 11 = 11, 22, ... 99, ⬤110 , ...

   LCM of 10 and 11 = 110

   $$\dfrac{9}{10} = \dfrac{9 \times 11}{10 \times 11} = \dfrac{99}{110}$$

   $$\dfrac{7}{11} = \dfrac{7 \times 10}{11 \times 10} = \dfrac{70}{110}$$

   $\therefore \quad \dfrac{9}{10} + \dfrac{7}{11} = \dfrac{99}{110} + \dfrac{70}{110}$

   $$= \dfrac{99 + 70}{110} = \dfrac{169}{110} = \dfrac{169}{11} \cdot = 15\dfrac{4}{11}$$

   (b) $\dfrac{3}{5} + \dfrac{9}{10}$

   Multiples of 5 = 5, ⬤10 , 15, 20,...

   Multiples of 10 = ⬤10 , 20, 30,....

   LCM of 5 and 10 = 10

   $$\dfrac{3}{5} = \dfrac{3 \times 2}{5 \times 2} = \dfrac{6}{10}$$

   $\therefore \quad \dfrac{3}{5} + \dfrac{9}{10} = \dfrac{6}{10} + \dfrac{9}{10}$

   $$= \dfrac{6 + 9}{10} = \dfrac{15}{10} = 1\dfrac{5}{10}$$

   (c) $\dfrac{3}{9} - \dfrac{1}{9} = \dfrac{3 - 1}{9} = \dfrac{2}{9}$

   (d) $1\dfrac{7}{3} - \dfrac{9}{6}$

   LCM of 3 and 6 = 6

   $$1\dfrac{7}{3} = \dfrac{10}{3} = \dfrac{10 \times 2}{3 \times 2} = \dfrac{20}{6}$$

   $\therefore \quad 1\dfrac{7}{3} - \dfrac{9}{6} = \dfrac{20}{6} - \dfrac{9}{6}$

   $$= \dfrac{20 - 9}{6} = \dfrac{11}{6} = 1\dfrac{5}{6}$$

3. (a) 1489 m in km

$1 \text{ m} = \dfrac{1}{1000} \text{ km}$

$1489 \text{ m} = \dfrac{1489}{1000} \text{ km} = 1.489 \text{ km}.$

(b) 1 kg 9689 g in g

1 kg = 1000 g

1 kg 9689 g = 1 kg + 9689 g

= 1000 g + 9689 g = 10689 g

(c) ₹ 872.75 in paise

₹ 1 = 100 paise

₹ 872.75 = 872.75 × 100 paise = 87275 paise

(d) 1 l in dl

1 l = 10 dl

4. The cost of the toy   =   ₹   250.50

The cost of the book = +   ₹   127.75

Total cost   =   ₹   378.25

So, the cost of the toy and the book altogether is ₹ 378.25.

5. Reaching time = 13 : 30 p.m. = 1330 hours

Time taken by bus = 4 hours 45 min.

The time bus start at

Hours	min
12	30 + 60 = 90
~~13~~	~~30~~
− 4	4 5
8	4 5

So, the bus started at 8 : 45 a.m.

6.

Weight of potatoes	=	2 kg	
Weight of pumpkin	=	1 kg	79 g
Weight of onion	=	1 kg	200 g
Weight of ladies finger	=		250 g
Weight of chillies	= +		50 g
Total weight of vegetables	=	4 kg	579 g

So, she bought 4 kg 579 g of vegetables.

7. Side of square = 6 cm.

Perimeter of square = 4 × 6 = 24 cm.

8. a. Two rays $\overrightarrow{OA}$ and $\overrightarrow{OB}$.

b. Name of the angle ∠*BOA*.

c. Points which is in the interior of angle *P* and *Q*.

d. Points which is exterior of angle *R* and *S*.

9.
$$8 + 10 = 18$$
$$18 + 20 = 38$$
$$38 + 30 = 68$$
$$\therefore \quad 68 + 40 = 108$$
$$\therefore \quad 108 + 50 = 158$$
and $\quad 158 + 60 = 218$

So, the pattern is 8, 18, 38, 68, **108, 158, 218**.

10.