

Exercise 10.5

1. (a) $0.8 = 0.8 \times 100\% = 80\%$
(b) $0.74 = 0.74 \times 100\% = 74\%$
(c) $0.81 = 0.81 \times 100\% = 81\%$
(d) $9.51 = 9.51 \times 100\% = 951\%$
(e) $3.472 = 3.472 \times 100\% = 347.2\%$
(f) $7.001 = 7.001 \times 100\% = 700.1\%$
2. (a) $8\% = \frac{8}{100} = \frac{2}{25}$
(b) $42\% = \frac{42}{100} = \frac{21}{50}$
(c) $2\% = \frac{2}{100} = \frac{1}{50}$
(d) $3\% = \frac{3}{100}$
(e) $5\% = \frac{5}{100} = \frac{1}{20}$
(f) $36\% = \frac{36}{100} = \frac{9}{25}$

Exercise 10.6

1. (a) $45\% \text{ of } 100 = \frac{45}{100} \times 100 = 45$
(b) $50\% \text{ of } 1000 = \frac{50}{100} \times 1000 = 500$
(c) $90\% \text{ of } 450 = \frac{90}{100} \times 450 = 405$
2. (a) $5\frac{1}{2}\% \text{ of } 75 \text{ kg}$
 $= \frac{11}{2}\% \text{ of } 75 \text{ kg} = \frac{11}{200} \times 75 \text{ kg} = \frac{11 \times 3}{8} \text{ kg} = \frac{33}{8} \text{ kg} = 4\frac{1}{8} \text{ kg}$
(b) $40\% \text{ of } 500 \text{ l}$
 $= \frac{40}{100} \times 500 \text{ l} = 40 \times 5 \text{ l} = 200 \text{ l}$
(c) $25\% \text{ of } 1 \text{ kg}$
 $= \frac{25}{100} \times 1000 \text{ g} = 25 \times 10 = 250 \text{ g}$
3. (a) $300 \text{ m of } 6 \text{ km}$
 $= 300 \text{ m of } 6000 \text{ m} = \frac{300}{6000} \times 100\% = 5\%$
(b) $24 \text{ g of } 3 \text{ kg}$
 $= 24 \text{ g of } 3000 \text{ g} = \frac{24}{3000} \times 100\% = 0.8\%$
(c) $12\frac{1}{2} \text{ kg of } 250 \text{ kg}$
 $= \frac{25}{2} \text{ of } 250 \text{ g} = \frac{25}{2 \times 250} \times 100\% = 5\%$
(d) $420 \text{ marks of } 600$
 $= \frac{420}{600} \times 100\% = 70\%$

(e) 10 min of 2 hours
 10 min of 120 min

$$= \frac{10}{120} \times 100 = \frac{10}{12} \times 100 = \frac{5}{6} \times 100 = \frac{500}{6} \% = 8\frac{1}{3} \%$$

(f) 250 ml of 1 l
 250 ml of 1000 ml

$$= \frac{250}{1000} \times 100\% = \frac{1}{4} \times 100\% = 25\%$$

Exercise 10.7

1. (a) Let $x\%$ of 40 min = 12 min
- $$\frac{x}{100} \times 40 = 12$$
- $$x = \frac{12 \times 100}{40}$$
- $$x = 3 \times 10 = 30$$
- \therefore 30% of 40 min = 12 min
- (b) Let $x\%$ of 50 kg = 7.5 kg
- $$\frac{x}{100} \times 50 = 7.5$$
- $$x = \frac{7.5 \times 100}{50}$$
- $$x = 7.5 \times 2 = 15$$
- \therefore 15% of 50 kg = 7.5 kg
- (c) Let $x\%$ of 1 m = 25 cm
 $x\%$ of 100 cm = 25 cm
- $$\frac{x}{100} \times 100 = 25$$
- $$x = 25$$
- \therefore 25% of 1 m = 25 cm
2. (a) 20% of 150 30% of 180
- $$\frac{20}{100} \times 150 \qquad \frac{30}{100} \times 180$$
- $$30 < 54$$
- \therefore 20% of 150 < 30% of 180
- (b) 15% of 300 or 12% of 200
- $$\frac{15}{100} \times 300 \qquad \frac{12}{100} \times 200$$
- $$15 \times 3 \qquad 12 \times 2$$
- $$45 > 24$$
- \therefore 15% of 300 > 12% of 200
3. Water = 20% of 2.5 l
- $$= \frac{20}{100} \times 2.5$$
- $$\text{water} = 0.5 \text{ l}$$
- \therefore he mixes 0.5 l of water in the milk
4. Weight of son = 60% of 75 kg
- $$= \frac{60}{100} \times 75 \text{ kg} = \frac{450}{10}$$
- weight of son = 45 kg

5. Amit got = 75% of 540

$$= \frac{\overset{3}{\cancel{75}}}{\underset{4}{\cancel{100}}} \times 540 = 3 \times 135$$

Amit got = 405 marks

6. Weight of mangoes = 30% of 80 kg

$$= \frac{30}{100} \times 80 \text{ kg} = 24 \text{ kg}$$

WORKSHEET

(a) families have 3 or more cars = (24 + 11)% of 200

$$= 35\% \text{ of } 200 = \frac{35}{100} \times 200 = 70 \text{ families}$$

(b) families have 2 cars = 19% of 200

$$= \frac{19}{100} \times 200 = 38$$

families have no cars = $\frac{21}{100} \times 200 = 42$

$$\therefore 42 - 38 = 4$$

(c) families have 1 car = $\frac{25}{100} \times 200 = 50$

families have no car = $\frac{21}{100} \times 200 = 42$

families with 1 car = $\frac{50}{42}$ families of no cars.

11. PERIMETER AND AREA

Exercise 11.1

1. (a) Perimeter = 4 + 5 + 6 = 15 cm

(b) Perimeter = 5.5 + 5.5 + 6.5 + 6.5 = 24 cm

(c) Perimeter = 80 cm + 80 cm + 120 cm + 120 cm = 400 cm = 4 m

(d) Perimeter = 4 × side = 4 × 29 cm = 116 cm

(e) Perimeter = 30 + 22 + 17 + 18 cm = 87 cm

2. (a) length of strip needed = 25 × 6 cm = 150 cm

(b) Perimeter = 1 + 1 + 5 + 1 + 1 + 4 + 4 + 1 + 1 + 1 + 1 + 5 = 8 + 10 + 8 = 26 m

(c) Perimeter of Equilateral triangle = 3 × side

$$= 3 \times 4 \text{ cm} = 12 \text{ cm}$$

(d) Perimeter of Pentagon = 5 × side

$$= 5 \times 3 = 15 \text{ inches}$$

(e) Perimeter of square = 4 × side

$$20 = 4 \times \text{side}$$

$$20 \div 4 = \text{side}$$

$$5 \text{ feet} = \text{side}$$

(f) Perimeter of hexagon = 6 × side



$$42 = 6 \times \text{side}$$

$$42 \div 6 = \text{side}$$

$$7 \text{ cm} = \text{side length}$$

3. Perimeter of shape = $13 + 8 + 5 + 6 + (13 - 6)$
 $= 13 + 8 + 5 + 6 + 7 = 42 \text{ m}$

Exercise 11.2

1. (a) Area of Rectangle = $l \times b = 8 \times 5 = 40 \text{ cm}^2$
- (b) Area of Rectangle = $l \times b = 10.5 \times 8.5 \text{ cm}^2 = 89.25 \text{ cm}^2$
- (c) Area of Rectangle = $l \times b = 15 \text{ cm} \times 9.5 \text{ cm} = 142.5 \text{ cm}^2$
- (d) Area of Rectangle = $l \times b = 12 \times 11 = 132 \text{ cm}^2$
2. (a) Area of square = side \times side
 $= 6.5 \times 6.5 = 42.25 \text{ cm}^2$
- (b) Area of square = side \times side
 $= 9 \times 9 = 81 \text{ cm}^2$
- (c) Area of square = side \times side
 $= 8.5 \times 8.5 = 72.25 \text{ cm}^2$
- (d) Area of square = side \times side
 $= 12 \times 12 = 144 \text{ cm}^2$

Exercise 11.3

1. (a) Area = $l \times b$
 $56 = 8 \times b$
 $= 56 \div 8 = b$
 $7 \text{ cm} = \text{breadth}$
- (b) Area = $l \times b$
 $75 = 15 \times b$
 $75 \div 15 = b$
 $5 \text{ cm} = \text{breadth}$
- (c) Area = $l \times b = 32 = l \times 4$
 $32 \div 4 = l$
 $8 \text{ cm} = \text{length}$
- (d) Area = $l \times b$
 $100 = l \times 10$
 $100 \div 10 = \text{length}$
 $10 \text{ cm} = \text{length}$
2. (a) Area of triangle = $\frac{1}{2} \times 8 \times 14 = 4 \times 14$
Area of triangle = 56 cm^2
- (b) Area of triangle = $\frac{1}{2} \times b \times h$
 $= \frac{1}{2} \times 9 \times 16 = 9 \times 8$



$$\text{Area of triangle} = 72 \text{ cm}^2$$

$$\begin{aligned} \text{(c) Area of triangle} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 14 \times 23 = 7 \times 23 \end{aligned}$$

$$\text{Area of triangle} = 161 \text{ cm}^2$$

$$\text{(d) Area triangle} = \frac{1}{2} \times 18 \times 27 = 9 \times 27$$

$$\text{Area of triangle} = 243 \text{ cm}^2$$

3. (a) Area of Rectangle = $l \times b$
 $= 7 \times 4 = 28 \text{ cm}^2$
- (b) Area rectangle = $l \times b$
 $= 12 \times 9 = 108 \text{ cm}^2$
- (c) Area of Rectangle = $l \times b$
 $= 19 \times 14 = 266 \text{ cm}^2$
- (d) Area of Rectangle = $l \times b$
 $= 35 \times 12 = 420 \text{ cm}^2$

4. (a) Area of triangle = $\frac{1}{2} \times b \times h$
 $36 = \frac{1}{2} \times 12 \times h$
 $\frac{36 \times 2}{12} = h$
 $6 \text{ cm} = h$
- (b) Area of triangle = $\frac{1}{2} \times b \times h$
 $= \frac{1}{2} \times 80 \times 140 = 40 \times 140$

$$\text{Area of } \Delta = 5600 \text{ cm}^2$$

- (c) Area of triangle = $\frac{1}{2} \times b \times h$
 $48 = \frac{1}{2} \times b \times 24$
 $\frac{48 \times 2}{24} = b$
 $4 \text{ cm} = b$

- (d) Area of triangle = $\frac{1}{2} \times b \times h$
 $150 = \frac{1}{2} \times 25 \times h$
 $\frac{150 \times 2}{25} = h$

$$6 \times 2 = h$$

$$12 \text{ cm} = h$$

$$\begin{aligned} \text{(e) Area of } \Delta &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 40 \times 25 = 20 \times 25 = 500 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{(f) Area of } \Delta &= \frac{1}{2} \times b \times h \\ 12000 &= \frac{1}{2} \times b \times 600 \\ &= \frac{12000 \times 2}{600} = b \end{aligned}$$

$$40 \text{ cm} = b$$

$$5. \text{ (a) Area} = \text{Ar of } \Delta ABC + \text{Ar of square } BCDE$$

$$\begin{aligned} &= \frac{1}{2} \times b \times h + \text{Side} \times \text{Side} \\ &= \frac{1}{2} \times 6 \times 4 + 6 \times 6 \\ &= 12 + 36 = 48 \text{ cm}^2 \end{aligned}$$

$$\text{(b) Area} = \text{Ar of square } ABCD + \text{Ar of } \Delta BCE$$

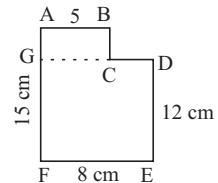
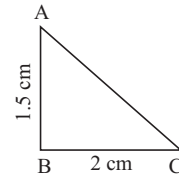
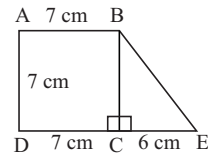
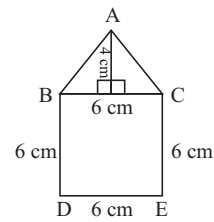
$$\begin{aligned} &= \text{Side} \times \text{Side} + \frac{1}{2} \times b \times h \\ &= 7 \times 7 + \frac{1}{2} \times 6 \times 7 \\ &= 49 + 3 \times 7 \\ &= 49 + 21 = 70 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{(c) Area of } \Delta ABC &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 2 \times 1.5 = 1.5 \text{ cm}^2 \end{aligned}$$

$$\text{(d) } AG = AF - DE$$

$$= 15 - 12 = 3$$

$$\begin{aligned} \text{Area} &= \text{Ar Rectangle } ABCG + \text{Ar Rectangle } GDEF \\ &= l \times b + l \times b \\ &= 5 \times 3 + 8 \times 12 = 15 + 96 = 111 \text{ cm}^2 \end{aligned}$$



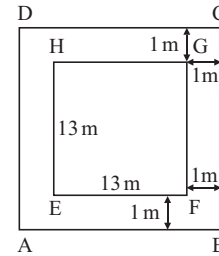
Exercise 11.4

$$1. \text{ Area of Room} = l \times b = 10 \times 6 = 60 \text{ cm}^2$$

$$\text{Cost of carpeting} = 60 \times 35 = ₹ 2100$$

2. Area of lawn = Side \times Side
 $= 20 \times 20 = 400 \text{ m}^2$

3. $EF = 13 \text{ m}$ $AB = 13 + 1 + 1 = 15 \text{ m}$
 Area of path = Ar $ABCD - \text{Area } EFGH$
 $= 15 \times 15 - 13 \times 13$
 $= 225 - 169 = 56 \text{ m}^2$
 Cost of laying the path = ₹ 56×15
 $= ₹ 840$



4. Area of carpet = $l \times b$
 $72 \text{ m}^2 = 12 \times b$
 $72 \div 12 = b$
 $6 \text{ m} = \text{breadth}$

5. Area of Rectangle = $l \times b$
 $= 15 \times 7 = 105 \text{ m}^2$

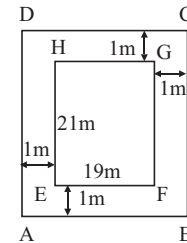
Area of square = Side \times Side
 $10 \times 10 = 100 \text{ m}^2$

Area of Rectangle is more

6. $AB = 19 + 1 + 1 = 21 \text{ m}$, $BC = 21 + 1 + 1 = 23 \text{ m}$
 Area of path = Ar $ABCD - \text{Ar } EFGH$
 $= 21 \times 23 - 21 \times 19$
 $= 483 - 399 = 84 \text{ m}^2$

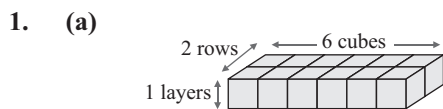
Cost of laying the path = ₹ $84 \times 12 = ₹ 1008$

7. Number of cards = $\frac{\text{Area of sheet}}{\text{Area of 1 card}}$
 $= \frac{30 \times 20}{15 \times 10} = 2 \times 2 = 4$

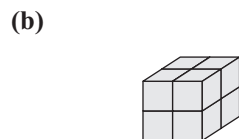


12. VOLUME

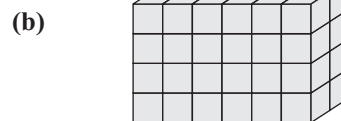
Exercise 12.1



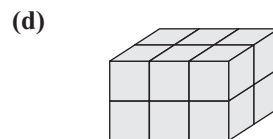
Volume = 12 cm^3



Volume = 8 cm^3

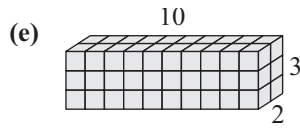


Volume = 48 cm^3

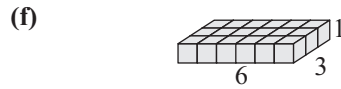


Volume = 24 cm^3





$$\text{Volume} = 60 \text{ cm}^3$$



$$\text{Volume} = 18 \text{ cm}^3$$

Exercise 12.2

1. (a) Volume of cube = Side \times Side \times Side
 $= 5 \times 5 \times 5 = 125 \text{ cm}^3$
- (b) Volume of cube = Side \times Side \times Side
 $= 7.5 \times 7.5 \times 7.5 = 421.875 \text{ cm}^3$
- (c) Volume of cube = Side \times Side \times Side
 $= 11 \times 11 \times 11 = 1331 \text{ cm}^3$
- (d) Volume of cube = Side \times Side \times Side
 $= 8\frac{1}{2} \times 8\frac{1}{2} \times 8\frac{1}{2} = 8.5 \times 8.5 \times 8.5 = 614.125 \text{ cm}^3$
2. (a) Volume of cuboid = $l \times b \times h$
 $= 7 \times 4 \times 3 = 84 \text{ cm}^3$
- (b) Volume of cuboid = $l \times b \times h$
 $= 10 \times 9 \times 2 = 180 \text{ cm}^3$
3. (a) Volume of cuboid = $l \times b \times h$
 $= 10 \times 10 \times 10 = 1000 \text{ cm}^3$
- (b) Volume of cuboid = $l \times b \times h$
 $= 20 \times 15 \times 10 = 3000 \text{ cm}^3$
- (c) Volume of cube = Side \times Side \times Side
 $= 5.2 \times 5.2 \times 5.2 = 140.608 \text{ cm}^3$
- (d) Volume of cuboid = $l \times b \times h$
 $= 12 \times 8 \times 5 = 480 \text{ cm}^3$
4. (a) Volume of cuboid = $11 \times 9 \times 7 = 693 \text{ cm}^3$
- (b) $\text{length} = \frac{\text{Volume}}{\text{breadth} \times \text{height}}$
- (c) Volume of cube = Side \times Side \times Side
- (d) Volume of cuboid = length \times breadth \times height
- (e) length, breadth and height

Exercise 12.3

- (a) Volume of cupboard = $l \times b \times h$
 $8 = 4 \times b \times 2$
 $\frac{8}{4} = b$
 $1 \text{ m} = \text{breadth}$



- (b) Volume of swimming pool = $l \times b \times h$
 $= 25 \times 15 \times 10$
 $= 25 \times 150 = 3750 \text{ cm}^3$
- (c) length = 1 m = 100 cm
breadth = 60 cm
height = 20 cm
volume of aquarium = $l \times b \times h$
 $= 100 \times 60 \times 20 \text{ cm}^3$
Water aquarium can hold = 120000 cm^3
- (d) Volume = Area of base \times height
 $384 = \text{Side} \times \text{Side} \times \text{height}$
 $384 = 8 \times 8 \times \text{height}$
 $384 = 64 \times \text{height}$
 $\frac{384}{64} = \text{height}$
6 cm = height
- (e) Capacity of cube = side \times side \times side
 $= 20 \times 20 \times 20 = 8000 \text{ cm}^3$
- (f) Capacity of tank = $l \times b \times h$
 $= 18 \times 15 \times 10 = 270 \times 10 = 2700 \text{ m}^3$
- (g) Volume of Rectangular wood = Area of base \times height
 $V = 78 \times 13$
Volume = 1014 cm^3
- (h) Volume of water in tank = $l \times b \times h$
 $= 35 \times 30 \times 15$
 $= 15750 \text{ cm}^3$
 $= \frac{15750}{1000} \text{ l}$
Volume of water in tank = 15.750 l
- (i) Volume of book = Area of base \times height
 $= 125 \text{ cm}^2 \times 25$
 $= 3125 \text{ cm}^3$
- (j) books can be put in carton = $\frac{\text{Volume of carton}}{\text{volume of a book}}$
 $= \frac{10 \times 5 \times 4}{5 \times 3 \times 3} = 10 \times 5 \times 4 = 200 \text{ books}$

13. Bills

Exercise 13.1

1.	Item	rate	Quantity	Cost
	rice	₹ 15/kg	5 kg	$15 \times 5 = ₹ 75$



Milkbottle	₹ 36/bottle	6	$36 \times 6 = ₹ 216$
Oil	₹ 28/lit	$\frac{1}{2}$ lit	$28 \times \frac{1}{2} = ₹ 14$
Wheat	₹ 30/kg	10 kg	$30 \times 10 = ₹ 300$
			<u>₹ 605</u>

2.

Name of Customer : Mr. Gupta				Date : 8.09.2011
S.No.	Description	Quantity	Cost per metre (₹)	Total Cost (₹)
1.	Brown silk cloth	4 m	50.00	200.00
2.	Crepe silk cloth	7 m	250.00	1750.00
3.	Pink cotton cloth	5.5 m	28.00	154.00
4.	Polyster cloth	3.5m	40.00	140.00
5.	Rayon cloth	5 m	15.00	75.00
			Grand Total	2319

3.

Item	rate	quantity	Cost
(a) Apple	₹ 40/kg	5 kg	$40 \times 5 = ₹ 200$
Bananas	₹ 22/doz	3 doz	$22 \times 3 = ₹ 66$
Grapes	₹ 18/kg	2 kg	$18 \times 2 = ₹ 36$
			Tina pay= ₹ 302

(b) Puja paid = ₹ 80 × 2 = ₹ 160

Item	rate	quantity	cost
(c) Wartermelons	₹ 20/kg	4 kg	$20 \times 4 = ₹ 80$
litchies	₹ 261/kg	6 kg	$26 \times 6 = ₹ 156$
			Shilpa pays = ₹ 236

(d) (i)

Item	Rate	Quantity	Cost
guava	20/kg	2 kg	$20 \times 2 = ₹ 40$
litchies	26/kg	2.5 kg	$26 \times 2.5 = ₹ 65$
bananas	22/doz	3 doz	$22 \times 3 = ₹ 66$

For Shyam Grand total= ₹ 171

(ii) For Rakesh

Item	Rate	Quantity	Cost
grapes	18/kg	6.5 kg	$18 \times 6.5 = ₹ 117$
Apples	40/kg	7.5	$40 \times 7.5 = ₹ 300$
gava	20/kg	3.5 kg	$20 \times 3.5 = ₹ 70$

Grand total = ₹ 487

(iii) For Ramesh

Item	Rate	Quantity	Cost
guava	20/kg	1 kg	$20 \times 1 = ₹ 20$
cherries	80/kg	4.5 g	$80 \times 4.5 = ₹ 360$
watermelon	20/kg	0.5 kg	$20 \times 0.5 = ₹ 10$

Grand total = ₹ 390

4. Bill for Ankur

Item	Rate	Quantity	Cost
rice	₹ 34.20/kg	2 kg	$34.20 \times 2 = ₹ 68.40$
wheat	₹ 22.90/kg	5.5 kg	$22.90 \times 5.5 = ₹ 125.95$
sugar	₹ = 20.50/kg	5 kg	$20.50 \times 5 = ₹ 102.50$
pulses	₹ 40/kg	3.5 kg	$40 \times 3.5 = ₹ 140.00$
			Grand Total = ₹ 436.85

5. Do yourself.

WORKSHEET

Bill No. 1085

Date : 15.04.11

Name of Customer : Mr. Rajat

Particulars

S.No.	Description	Quantity	Cost per unit	Total Cost
1.	Wheat	2.5 kg	₹ 6.00	₹ 15.00
2.	Pulse	4 kg	₹ 20.00	₹ 80.00
3.	Mustard oil	2 Litres	₹ 74.50	₹ 149.00
4.	Coffee	4 kg	₹ 22.00	₹ 88.00
5.	Tea	0.5 kg packet	₹ 140.00	₹ 70
6.	Rice	3.5 kg	₹ 36.00	₹ 126
7.	Ice-cream	2 cups	₹ 10.00	₹ 20
				Grand Total ₹ 548



Formative Assessment-II

1. (a) $52.208 \div 1000 = 0.052208$ (b) $34.62 \div 1000 = 0.03462$
 (c) $8.87 \div 100 = 0.0887$ (d) $452.428 \div 1000 = 0.452428$
2. (a) $\frac{79}{6} = 18\frac{1}{6}$ (b) $\frac{125}{12} = 10\frac{5}{12}$
3. (a) $56 \div 4 + 12 \times 2 = 14 + 12 \times 2 = 14 + 24 = 38$
 (b) $75 \times 2 + 32 \div 4 - 78 = 150 + 8 - 78 = 158 - 78 = 80$
4. (a) $1\frac{1}{2}\%$ of 600 m = $\frac{3}{2}\%$ of 600 = $\frac{3}{200} \times 600 = 9$ m
 (b) 15% of 300 toffees
 $\frac{15}{100} \times 300 = 45$ toffees
5. (a) Area = $b \times h = 21 \times 10 = 210 \text{ cm}^2$ (b) Area = $25 \times 8 = 200 \text{ cm}^2$
6. Perimeter = $15 + 19 + 23 = 57$ cm
7. (a) Volume of cube = Side \times Side \times Side
 $= 8.5 \times 8.5 \times 8.5$
 $= 615.125 \text{ cm}^3$
 (b) Volume of cube = Side \times Side \times Side
 $= 4492.125 \text{ cm}^3$
8. \therefore Volume = 1226 cm^3
 \therefore Capacity = 1226 cm^3
9. (a) $4.308 = \frac{4308 \div 4}{1000 \div 4} = \frac{1077}{250}$ (b) $16.35 = \frac{1635}{100} = \frac{1635 \div 5}{100 \div 5} = \frac{327}{20}$
10. (a) $8\frac{1}{4} \times 2 = \frac{33}{4} \times 2 = \frac{33 \times \cancel{2}}{\cancel{4}} = \frac{33}{2} = 16\frac{1}{2}$
 (b) $3\frac{1}{5} \times 3 = \frac{16}{5} \times 3 = \frac{16 \times 3}{5} = \frac{48}{5} = 9\frac{3}{5}$
11. (a) $1\frac{2}{7} + \frac{5}{14} + 1\frac{1}{21}$

$$\begin{aligned}
 &= 1 + \frac{2}{7} + \frac{5}{14} + 1 + \frac{1}{21} \\
 &= (1+1) + \left(\frac{2}{7} + \frac{5}{14} + \frac{1}{21} \right) \\
 &= 2 + \left[\frac{2 \times 6}{7 \times 6} + \frac{5 \times 3}{14 \times 3} + \frac{1 \times 2}{21 \times 2} \right] \\
 &= 2 + \left[\frac{12}{42} + \frac{15}{42} + \frac{2}{42} \right] \\
 &= 2 + \left[\frac{12+15+2}{42} \right] = 2 + \frac{19}{42} = 2\frac{19}{42}
 \end{aligned}$$



$$(b) \quad \frac{4}{13} + \frac{2}{13} + \frac{5}{13} = \frac{4+2+5}{13} = \frac{11}{13}$$

12. Total length

$$\begin{array}{r} 2.46 \text{ m} \\ 1.35 \text{ m} \\ + 0.92 \text{ m} \\ \hline 4.73 \text{ m} \end{array}$$

13. (a) 53% (b) 21% (c) 79% (d) 83%

Summative Assessment

1. (a) $94,156 < 41,34,561 > 34,187 > 11,841$
 (b) $84,894 > 41,814 > 38,461 > 31,819$
2. (a) $XC > XL$ (b) $LVIII < C$ (c) $MCC < MDC$ (d) $LV = LV$
3. (a)

$$\begin{array}{r} 135 \overline{) 456374} \quad (3380 \\ \underline{405} \\ 513 \\ \underline{405} \\ 1087 \\ \underline{1080} \\ 74 \end{array}$$

Quotient = 3380; Remainder = 74

Checking

$$\begin{aligned} \text{Divident} &= \text{Divisor} \times Q + R \\ 456374 &= 135 \times 3380 + 74 = 456300 + 74 \\ 456374 &= 456374 \end{aligned}$$

(b) $485916 \div 324$

$$\begin{array}{r} 324 \overline{) 485916} \quad (1499 \\ \underline{324} \\ 1619 \\ \underline{1296} \\ 3231 \\ \underline{2916} \\ 3156 \\ \underline{2916} \\ 240 \end{array}$$

\therefore Quotient = 1499; Remainder = 240

Checking

$$\begin{aligned} \text{Divident} &= \text{Divisor} \times Q + R \\ 485916 &= 324 \times 1499 + 240 \\ &= 485676 + 240 = 485916 \end{aligned}$$



4. (a)

2	24
2	12
2	6
3	3
	1

2	36
2	18
3	9
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

Prime factors of 24 = $2 \times 2 \times 2 \times 3$ of

Prime factors of 36 = $2 \times 2 \times 3 \times 3$

Prime factors of 48 = $2 \times 2 \times 2 \times 2 \times 3$

LCM of 24, 36, 48 = $2 \times 2 \times 2 \times 2 \times 3 \times 3 = 16 \times 9 = 144$

(b)

2	96
2	48
2	24
2	12
2	6
	3

5	85
17	17
	1

2	72
2	36
2	18
3	9
	3

2	60
2	30
3	15
	5

Prime factors of 96 = $2 \times 2 \times 2 \times 2 \times 2 \times 3$

Prime factors of 85 = 5×17

Prime factors of 72 = $2 \times 2 \times 2 \times 3 \times 3$

Prime factors of 60 = $2 \times 2 \times 3 \times 5$

LCM of 96, 85, 72, 60 = $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 17 = 24480$

5. (a) $25 \frac{78}{100} = \frac{2578}{100} = 25.78$

(b) $13 \frac{2}{1000} = \frac{13002}{1000} = 13.002$

6. (a) $[(50 + 4) \times \{(80 \div 16) + 30\}]$

$$= [54 \times \{5 + 30\}]$$

$$= 54 \times 35 = 1890$$

(b) $[30 - \{32 \div 8 \times 2 \times 2\}]$

$$= \{30 - (4 \times 2) \times 2\}$$

$$= 30 - 8 \times 2$$

$$= 30 - 16 = 14$$



7. Area of triangular paper = $\frac{1}{2} \times \text{base} \times \text{height}$
 $= \frac{1}{2} \times 20 \times 10 = 100 \text{ cm}^2$

8. distance covered in 1 round = $4 \times \text{side}$
 $= 4 \times 50 = 200 \text{ m}$
distance covered in 6 rounds = $200 \times 6 = 1200 \text{ m}$

9. (a)
$$\begin{array}{r} 756745 \\ \times 36 \\ \hline 4540470 \\ 2270235 \times \\ \hline 27242820 \end{array}$$

(b)
$$\begin{array}{r} 830397 \\ \times 546 \\ \hline 4982382 \\ 3321588 \times \\ 4151985 \times \times \\ \hline 453396762 \end{array}$$

10. (a)

5	285
3	57
19	19
	1

\therefore Prime factors of 285
 $= 5 \times 3 \times 19$

(b)

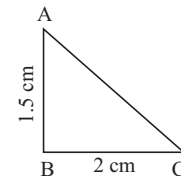
2	120
2	60
2	30
3	15
	5

Prime factors of 120
 $= 2 \times 2 \times 2 \times 3 \times 5$

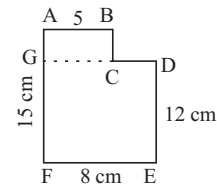
11. (a) Volume of cube = $6 \times 2 \times 1 = 12 \text{ cm}^3$

(b) Volume of cube = $6 \times 2 \times 4 = 48 \text{ cm}^3$

12. (a) Area of $\Delta ABC = \frac{1}{2} \times \text{base} \times h$
 $= \frac{1}{2} \times 2 \times 1.5$
 $= 1.5 \text{ cm}^2$



(b) $AG = 15 - 12 = 3 \text{ cm}$
 $Ar = Ar\ ABCG + Ar\ GDEF$
 $= l \times b + l \times b$
 $= 5 \times 3 + 8 \times 12$
 $= 15 + 96 = 111 \text{ cm}^2$



14. Profit and Loss

Exercise 14.1

1. (a) Profit = SP – CP
 $= 1000 - 700 = ₹ 300$
- (b) loss = CP – SP
 $= 18.00 - 16.50 = ₹ 1.50$
- (c) loss = CP – SP
 $= 300 - 175$
 $= ₹ 125$
- (d) Profit = SP – CP
 $= 149.50 - 132.75$
 $= ₹ 16.75$
- (e) Profit = SP – CP
 $= 141.00 - 132.25$
 $= ₹ 8.75$
- (f) loss = CP – SP
 $= ₹ 485.75 - ₹ 356.25$
 $= ₹ 120.50$
2. (a) Total CP of bike = ₹ 30,250 + ₹ 425
 $= ₹ 30,675$
 SP of bike = ₹ 30,000
 loss = ₹ 30675 – ₹ 130000
 loss for Reena = ₹ 675
- (b) CP of toffees = ₹ 20 × 35 = ₹ 700
 SP of toffees = ₹ 1000
 gain on toffees = ₹ 1000 – ₹ 700
 $= ₹ 300$
- (c) CP of 20 dozens pencils = 20 × 160 = ₹ 3200
 SP of 20 dozens pencils = 9.5 × 20 × 12 = ₹ 2280
 loss on pencils = ₹ 3200 – 2280 = ₹ 920
- (d) Total CP of scooter = ₹ 5,40,000 + ₹ 20,000
 $= ₹ 5,60,000$
 SP of scooter = ₹ 5,67,250
 \therefore gain on scooter = ₹ 5,67,250 – ₹ 5,60,000
 $= ₹ 7,250$
- (e) CP of 10 chairs = 10 × 60 = ₹ 600
 CP of 60 tables = 60 × 40 = ₹ 2400
 Total CP = ₹ 3000
- SP of 10 chairs = 50 × 10 = ₹ 500
 SP of 60 tables = 60 × 50 = ₹ 3000
 Total SP = ₹ 3500
- gain = SP – CP
 $= 3500 - 3000$
 $= ₹ 500$

Exercise 14.2

1. (a) CP = SP + loss
 $= 475 + 55$
 $= ₹ 530$
- (b) CP = SP + loss
 $= ₹ 785.25 + ₹ 2.75$
 $= ₹ 788.00$



- (c) $CP = SP - \text{profit}$
 $= ₹ 7055.00 - ₹ 501.25$
 $= ₹ 6553.75$
2. (a) $SP = CP + \text{Profit}$
 $= ₹ 475.00 + ₹ 25.50$
 $= ₹ 500.50$
- (c) $SP = CP - \text{loss}$
 $= ₹ 1050 - ₹ 275$
 $= ₹ 775$
3. (a) $SP \text{ of Jeans} = CP \text{ of jeans} + \text{Profit}$
 $= ₹ 500 + ₹ 120$
 $= ₹ 620$
- (b) $CP \text{ of chair} = SP - \text{Profit}$
 $= ₹ 4700 - 500$
 $= ₹ 4200$
- (c) $SP \text{ of microwave} = CP \text{ of microwave} + \text{Profit}$
 $= ₹ 9990 + ₹ 650$
 $= ₹ 10640$
- (d) $CP \text{ of car} = SP \text{ of car} - \text{Profit}$
 $= ₹ 1,32,050 - ₹ 10000$
 $= ₹ 1,22,050$
- (e) $SP \text{ of DVD} = CP - \text{loss}$
 $= ₹ 2250 - ₹ 200$
 $= ₹ 2050$
- (f) $CP = SP + \text{loss}$
 $= ₹ 650 + 300$
 $\therefore CP \text{ of calculator} = ₹ 950$
- (g) $SP \text{ of stereo} + SP + \text{loss}$
 $= ₹ 5625 + ₹ 875$
 $= ₹ 6500$
- (h) $SP \text{ of Casio} = CP - \text{loss}$
 $= ₹ 5000 - ₹ 1250$
 $= ₹ 3750$
- (d) $CP = SP - \text{Profit}$
 $= ₹ 435.65 - ₹ 62.75$
 $= ₹ 372.90$
- (b) $SP = CP + \text{Profit}$
 $= ₹ 2235.25 + ₹ 30.75$
 $= ₹ 2266.00$
- (d) $SP = CP - \text{loss}$
 $= ₹ 925.25 - ₹ 18.75$
 $= ₹ 906.50$

Exercise 14.3

1. (a) $\text{Profit} = 10\% \text{ of } CP$
 $= 10\% \text{ of } 800$
 $= \frac{10}{100} \times 800$
 $\text{Profit} = ₹ 80$
- (b) $\text{Profit} = 20\% \text{ of } ₹ 750$
 $= \frac{20}{100} \times 750$
 $\text{Profit} = ₹ 150$
- (c) $\text{loss} = 15\% \text{ of } ₹ 900$
 $= \frac{15}{100} \times 900$
 $\text{loss} = ₹ 135$
- (d) $\text{loss} = 30\% \text{ of } ₹ 2000$
 $= \frac{30}{100} \times 2000$
 $\text{loss} = ₹ 600$

2. (a) CP = ₹ 800 SP = ₹ 600

$$\begin{aligned} \text{loss} &= \text{CP} - \text{SP} \\ &= 800 - 600 = 200 \end{aligned}$$

$$\begin{aligned} \text{loss \%} &= \frac{\text{loss}}{\text{CP}} \times 100 \\ &= \frac{200}{800} \times 100 \end{aligned}$$

$$\text{loss \%} = 25\%$$

(c) SP = ₹ 1050 CP = 1200

$$\begin{aligned} \text{loss} &= \text{CP} - \text{SP} \\ &= 1200 - 1050 \\ &= 150 \end{aligned}$$

$$\begin{aligned} \text{loss \%} &= \frac{l}{\text{CP}} \times 100 \\ &= \frac{150}{1200} \times 100 \\ &= 12\frac{1}{2}\% \end{aligned}$$

(e) CP = ₹ 250.50 SP = 300.50

$$\begin{aligned} \text{Profit} &= \text{SP} - \text{CP} \\ &= ₹ 300.50 - ₹ 250.50 \\ &= ₹ 50.00 \end{aligned}$$

$$\begin{aligned} \text{Profit \%} &= \frac{\text{Profit}}{\text{CP}} \times 100 \\ &= \frac{50}{250.50} \times 100 \\ &= \frac{50000}{25.50} \% \\ &= 19.96\% \end{aligned}$$

3. (a) CP of belt = ₹ 250

SP of belt = ₹ 325

$$\begin{aligned} \text{Profit} &= \text{SP} - \text{CP} \\ &= 325 - 250 = 75 \end{aligned}$$

$$\begin{aligned} \text{Profit \%} &= \frac{\text{Profit}}{\text{CP}} \times 100 \\ &= \frac{75}{250} \times 100 = 3 \times 10 \end{aligned}$$

Profit on belt = 30%

(b) CP of toy = ₹ 60

SP of toy = ₹ 100

$$\begin{aligned} \text{Profit on toy} &= \text{SP} - \text{CP} \\ &= ₹ 100 - ₹ 60 = ₹ 40 \end{aligned}$$

(b) CP = ₹ 800 SP = ₹ 850

$$\begin{aligned} \text{profit} &= \text{SP} - \text{CP} \\ &= ₹ 850 - ₹ 800 = ₹ 50 \end{aligned}$$

$$\begin{aligned} \text{profit \%} &= \frac{\text{profit}}{\text{CP}} \times 100 \\ &= \frac{50}{800} \times 100 \end{aligned}$$

$$= \frac{25}{4} = 6\frac{1}{4}\%$$

(d) CP = 1500 SP = 1800

$$\begin{aligned} \text{Profit} &= \text{SP} - \text{CP} \\ &= ₹ 1800 - ₹ 1500 \\ &= ₹ 300 \end{aligned}$$

$$\begin{aligned} \text{Profit \%} &= \frac{\text{profit}}{\text{CP}} \times 100 \\ &= \frac{300 \times 100}{1500} \end{aligned}$$

profit = 20%

(f) CP = ₹ 1250 SP = ₹ 1000

$$\begin{aligned} \text{loss} &= \text{SP} - \text{CP} \\ &= 1250 - 1000 \end{aligned}$$

loss = 250

$$\begin{aligned} \text{loss \%} &= \frac{1}{\text{CP}} \times 100 \\ &= \frac{250}{1250} \times 100 \end{aligned}$$

= 20%

$$\begin{aligned}\text{Profit \%} &= \frac{\text{Profit}}{\text{CP}} \times 100 \\ &= \frac{40}{60} \times 100 = \frac{400}{6} = 66.66\%\end{aligned}$$

- (c) CP of Saree = ₹ 5000
 SP of saree = ₹ 4500
 loss on saree = ₹ 5000 – ₹ 4500
 = ₹ 500
 loss % on saree = $\frac{\text{loss}}{\text{CP}} \times 100 = \frac{500}{5000} \times 100 = 10\%$
- (d) CP of bag = ₹ 2500
 loss = ₹ 250
 loss % = $\frac{\text{loss}}{\text{CP}} \times 100 = \frac{250}{2500} \times 100$
 loss = 10%
- (e) CP of socks = ₹ 800
 Profit = ₹ 150
 Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100 = \frac{150 \times 100}{800} = 18.75\%$
- (f) CP of scooter = ₹ 35000
 CP of scooter = ₹ 30000
 loss on scooter = ₹ 35000 – ₹ 30000 = ₹ 5000
 loss % = $\frac{l}{\text{CP}} \times 100 = \frac{5000}{35000} \times 100 = 13\frac{3}{7}\%$
- (g) T. CP of bike = ₹ 62000 + ₹ 3000
 = ₹ 65000
 SP of bike = ₹ 70,000
 Profit on bike = SP – CP
 = ₹ 70000 – ₹ 65000 = ₹ 5000
 Profit % = $\frac{\text{Profit}}{\text{CP}} \times 100 = \frac{5000}{65000} \times 100 = 7.69\%$

WORKSHEET

S.No.	Name of the Article	CP	SP	Profit/Loss	Profit/Loss %
1.	frock	₹ 80	₹ 100	profit = 20	25% profit
2.	shoes	₹ 110	₹ 100	loss = 10	9.09% loss
3.	table	₹ 120	₹ 100	loss = 20	16.67% loss
4.	books	₹ 150	₹ 100	loss = 50	33.35% loss
5.	ball	₹ 40	₹ 100	profit = 60	150% profit

Total CP = 500 Total SP = 500

No profit No loss

15. SIMPLE INTEREST

Exercise 15.1

1. (a) $I = \frac{P \times r \times t}{100} = \frac{3000 \times 2 \times 6}{100} = ₹ 360$
- (b) $I = \frac{P \times r \times t}{100} = \frac{5000 \times 10 \times 5}{100} = ₹ 250$ 0
- (c) $I = \frac{P \times r \times t}{100} = \frac{4000 \times 8 \times 3}{100} = ₹ 960$
- (d) $I = \frac{P \times r \times t}{100} = \frac{1200 \times 11 \times 13}{100 \times 2} = ₹ 858$
- (e) $I = \frac{P \times r \times t}{100} = \frac{1500 \times 8 \times 3}{100 \times 2} = ₹ 180$
- (f) $I = \frac{P \times r \times t}{100} = \frac{10000 \times 8 \times 5}{100 \times 2} = ₹ 2000$
- (g) $I = \frac{P \times r \times t}{100} = \frac{5000 \times 15 \times 2}{100 \times 2} = ₹ 750$
- (h) $I = \frac{P \times r \times t}{100} = \frac{500 \times 5 \times 3}{100 \times 2} = ₹ 37.5$
- (i) $I = \frac{P \times r \times t}{100} = \frac{3000 \times 9 \times 3}{100 \times 2 \times 2} = ₹ 405$
- (j) $I = \frac{P \times r \times t}{100} = \frac{6000 \times 15 \times 5}{100 \times 2 \times 2} = ₹ 1125$
2. (a) here $P = ₹ 1800$ $r = 4\%$ P.a. time = 5 years
 $S.I. = \frac{P \times r \times t}{100} = \frac{1800 \times 4 \times 5}{100} = ₹ 360$
 \therefore Ramesh will get ₹ 360 as S.I.
- (b) here $P = ₹ 4000$ $r = 5\%$ P.a. time = 3 years
 $S.I. = \frac{P \times r \times t}{100} = \frac{400 \times 5 \times 3}{100} = ₹ 600$
 \therefore S.I. Kavita get is ₹ 600.
- (c) have $P = ₹ 1000$ $r = 3\frac{1}{2}\%$ time = 6 years
 $S.I. = \frac{P \times r \times t}{100} = \frac{1000 \times 7 \times 6}{100 \times 2} = ₹ 210$
 \therefore Shalini we get ₹ 210 as S.I.

(d) here $P = ₹ 8000$ $r = 8\%$ time $= 3\frac{1}{2}$ years

$$\therefore \text{S.I.} = \frac{P \times r \times t}{100} = \frac{8000 \times 8 \times 7}{100 \times 2} = ₹ 2240$$

\therefore Anuj paid ₹ 2240 as S.I.

(e) here $P = ₹ 1000$ $r = 5\frac{1}{2}\%$ time $= 2\frac{1}{2}$ year

$$= \frac{11}{2}\% = \frac{5}{2} \text{ years}$$

$$\therefore \text{S.I.} = \frac{P \times r \times t}{100} = \frac{1000 \times 11 \times 5}{100 \times 2 \times 2} = \frac{275}{2} = ₹ 137.5$$

\therefore Vishal will get ₹ 137.5 as S.I.

Exercise 15.2

1. (a) $I = A - P$

$$= ₹ 9325.75 - ₹ 8750 = ₹ 575.75$$

(b) Amount $= P + I$

$$= ₹ 3500 + ₹ 300 = ₹ 3800$$

(c) Amount $= P + I$

$$= ₹ 1523 + ₹ 477 = ₹ 2000$$

(d) Principal $= \text{Amount} - I$

$$= ₹ 7250 - ₹ 630$$

$$= ₹ 6620$$

(e) $I = A - P$

$$= ₹ 2530 - ₹ 2350 = ₹ 180$$

(f) $I = A - P$

$$= ₹ 510 - ₹ 425$$

$$= ₹ 85$$

2. (a) $I = 5\%$ of 4000

$$= \frac{5}{100} \times 4000 = ₹ 200$$

\therefore Amount $= P + I$

$$= 4000 + 200 = ₹ 4200$$

(b) $I = 6\frac{1}{2}\%$ of ₹ 5000

$$= \frac{15}{2}\% \text{ of ₹ } 5000$$

$$= \frac{15}{2 \times 100} \times \frac{5000}{25} = 15 \times 25 = ₹ 375$$

$$A = P + I$$

$$= 5000 + 375 = ₹ 5375$$

(c) Interest = 10% of 7250

$$= \frac{10}{100} \times 7250$$

$$= 725$$

$$\therefore \text{Amount} = P + I$$

$$= 7250 + 725$$

$$= ₹ 7975$$

(d) Interest = $7\frac{1}{2}$ % of 6000

$$= \frac{15}{2} \% \text{ of } 6000$$

$$= \frac{15}{200} \times 6000 = 450$$

$$\therefore \text{Amount} = P + I$$

$$= 6000 + 450 = ₹ 6450$$

Exercise 15.3

1. (a) $T = \frac{I \times 100}{P \times r} = \frac{180 \times 100}{1800 \times 5}$

Time = 2 years

(b) here $P = ₹ 1600$ $I = ₹ 600$ $r = \frac{15}{2} \%$

$$\therefore T = \frac{I \times 100}{P \times r} = \frac{600 \times 100}{1600 \times \frac{15}{2}} = \frac{60000 \times 2}{1600 \times 15}$$

$T = 5$ years

2. (a) here $P = ₹ 7500$ $I = ₹ 450$ time = $1\frac{1}{2}$ years = $\frac{3}{2}$ years

$$\therefore r = \frac{\text{S.I.} \times 100}{P \times \text{time}} = \frac{450 \times 100}{7500 \times \frac{3}{2}} = \frac{450 \times 100 \times 2}{7500 \times 3}$$

$$\text{rate} = \frac{900}{75 \times 3} \%$$

rate = 4%

(b) here $P = ₹ 2000$ $I = ₹ 120$ $t = 3$ years

$$\therefore r = \frac{\text{S.I.} \times 100}{P \times \text{time}} = \frac{120 \times 100}{2000 \times 3}$$

rate = 2%

3. (a) here $P = ₹ 750$ $I = ₹ 150$ $t = 4$ years

$$\therefore r = \frac{I \times 100}{P \times t} = \frac{150 \times 100}{750 \times 4}$$

rate = 5%

- (b) here $P = ₹ 1800$, $I = 675$, $r = 15\%$
 $\therefore t = \frac{I \times 100}{P \times r} = \frac{675 \times 100}{1800 \times 15}$
time = 2.5 years
- (c) here $P = ₹ 1500$ $I = ₹ 450$ $t = 5$ years
 $\therefore r = \frac{I \times 100}{P \times t} = \frac{450 \times 100}{1500 \times 5}$
rate = 6%
- (d) here $P = ₹ 8000$ $A = ₹ 9280$ $t = 2$ years
 $\therefore I = A - P = 9280 - 8000$
 $= ₹ 1280$
 $\therefore r = \frac{I \times 100}{P \times t} = \frac{1280 \times 100}{8000 \times 2}$
rate = 8%
- (e) here $P = ₹ 20000$ $A = ₹ 25000$ $r = 12\frac{1}{2}\% = \frac{25}{2}\%$
 $\therefore I = A - P$
 $= 25000 - 20000$
 $= ₹ 5000$
 $\therefore T = \frac{I \times 100}{P \times r} = \frac{5000 \times 100}{20000 \times \frac{25}{2}} = \frac{50}{2} \times \frac{2}{25}$
time = 2 years

WORKSHEET

S.No.	Date	Money Deposited/Withdraw	Balance
1.	4th Jan, 2008	Deposited ₹ 2000	2000
2.	8th Feb., 2008	Deposited ₹ 560	2560
3.	10th March, 2008	Withdrew ₹ 376	2184
4.	16th June, 2008	Withdrew ₹ 500	1684
5.	23rd December, 2008	Deposited ₹ 235.50	1919.50

Find the total amount at the end of year. ₹ 1919.50

Calculate the simple interest at the rate of 5% p.a.

$$I = \frac{P \times r \times t}{100} = \frac{1919 \times 5 \times \frac{1}{12}}{100} = ₹ 7.99$$

Calculate the amount at the end of the year. Amount $235.50 + 7.99 = ₹ 243.49$



16. AVERAGE

Exercise-16.1

1. (a) Sum of observation = $18 + 24 + 32 + 46 = 120$

$$\begin{aligned}\text{Average} &= \frac{\text{sum of observation}}{\text{number of observations}} \\ &= \frac{120}{4} = 30\end{aligned}$$

(b) sum of observation = $36 + 50 + 54 + 77 + 83 = 300$

$$\begin{aligned}\text{Average} &= \frac{\text{sum of observation}}{\text{number of observation}} \\ &= \frac{300}{5} = 60\end{aligned}$$

(c) sum of observation = $1.1 + 2.2 + 3.3 + 4.4 + 5.5 = 16.5$

$$\begin{aligned}\text{Average} &= \frac{\text{sum of observation}}{\text{number of observation}} \\ &= \frac{16.5}{5} = 3.3\end{aligned}$$

(d) sum of observation = $\frac{2}{10} + \frac{3}{10} + \frac{7}{20} + \frac{9}{25}$

$$\begin{aligned}&= \frac{2 \times 10}{10 \times 10} + \frac{3 \times 10}{10 \times 10} + \frac{7 \times 5}{20 \times 5} + \frac{9 \times 4}{25 \times 4} \\ &= \frac{20}{100} + \frac{30}{100} + \frac{35}{100} + \frac{36}{100} \\ &= \frac{20 + 30 + 35 + 36}{100} = \frac{121}{100}\end{aligned}$$

$$\text{Average} = \frac{\text{sum of observation}}{\text{number of observation}} = \frac{121}{\frac{100}{4}} = \frac{121}{400}$$

(e) sum of observation = $\frac{5}{9} + \frac{7}{18} \times \frac{8}{27}$

$$\begin{aligned}&= \frac{5 \times 6}{9 \times 6} + \frac{7 \times 3}{18 \times 3} + \frac{8 \times 2}{27 \times 2} \\ &= \frac{30}{54} + \frac{21}{54} + \frac{16}{54} = \frac{30 + 21 + 16}{54} = \frac{67}{54}\end{aligned}$$

$$\text{Average} = \frac{\text{sum of observation}}{\text{number of observation}}$$

$$= \frac{67}{\frac{54}{3}} = \frac{67}{54 \times 3}$$

$$\text{Average} = \frac{67}{162}$$

$$\begin{aligned}
 \text{(f) sum of observation} &= 1\frac{3}{5} + 2\frac{4}{15} + 3\frac{7}{25} \\
 &= 1 + \frac{3}{5} + 2 + \frac{4}{15} + 3 + \frac{7}{25} \\
 &= (1 + 2 + 3) + \left(\frac{3}{5} + \frac{4}{15} + \frac{7}{25}\right) \\
 &= 6 + \left[\frac{3 \times 15}{5 \times 15} + \frac{4 \times 5}{15 \times 5} + \frac{7 \times 3}{25 \times 3}\right] \\
 &= 6 + \left[\frac{45}{75} + \frac{20}{75} + \frac{21}{75}\right] \\
 &= 6 + \left[\frac{45 + 20 + 21}{75}\right] \\
 &= 6 + \frac{86}{75} = 6 + 1\frac{11}{75} = 7\frac{11}{75}
 \end{aligned}$$

$$\begin{aligned}
 \text{Average} &= \frac{\text{sum of observation}}{\text{number of observation}} \\
 &= 7\frac{11}{75} = \frac{536}{75 \times 3} = \frac{536}{225} = 2\frac{86}{225} \\
 &\quad 3
 \end{aligned}$$

2. (a) sum of observation = $98 + 96 + 84 + 72 + 85 = 435$

$$\text{Average} = \frac{\text{sum of observation}}{\text{number of observation}} = \frac{435}{5} = 87$$

(b) In 1 kg apples = 6

In 17 kg apples = $17 \times 6 = 102$

(c) sum of weekly income = $133.75 + 135.50 + 143.25 + 145.50 = 557.90$

$$\text{Average income} = \frac{\text{sum of income}}{\text{number of person}} = \frac{557.90}{4} = ₹ 139.475$$

(d) Average earning = $\frac{\text{total earning}}{\text{number of persons}}$

$$3400 = \frac{\text{total earning}}{12}$$

$$3400 \times 12 = \text{total earning}$$

$$₹ 40800 = \text{total earning}$$

(e) Average height = $\frac{\text{total height}}{\text{number of students}}$

$$150 = \frac{\text{total height of 12 students}}{12}$$

$$150 \times 12 = \text{total height of 12 students}$$

$$1800 = \text{total height of 12 students}$$

$$\text{Average height} = \frac{\text{total height of 18 students}}{18}$$

$$180 = \frac{\text{total height of 18 students}}{18}$$

$$180 \times 18 = \frac{\text{total height of 18 students}}{18}$$

$$3240 = \text{total height of 18 students}$$

$$\begin{aligned} \text{Average height of 30 students} &= \frac{\text{total weight of 30 students}}{30} \\ &= \frac{1800 + 3240}{30} = \frac{5040}{30} = 168 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{(f) Average distance} &= \frac{\text{total distance}}{7} \\ &= \frac{49}{7} = 7 \text{ km} \end{aligned}$$

$$\begin{aligned} \text{(g) total rainfall} &= 200 + 150 + 240 + 160 + 77 + 225 + 161 \\ &\quad + 240 + 160 + 85 + 205 \\ &= 1903 \end{aligned}$$

$$\begin{aligned} \text{Average rainfall} &= \frac{\text{total rainfall}}{11} \\ &= \frac{1903}{11} = 17 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{(h) Average sale} &= \frac{\text{total sale}}{3} \\ &= \frac{5500 + 4500 + 3500}{3} = \frac{13500}{3} \end{aligned}$$

$$\text{Average sale} = ₹ 4500$$

Exercise 17.1

1. (a) $d = 800 \text{ km}, t = 50 \text{ min} = \frac{50}{60} \text{ hr}$

$$\text{Speed} = \frac{d}{t} = \frac{800}{50/60} \text{ hr} = \frac{800 \times 60}{50} \text{ km/hr}$$

$$= 160 \times 6 = 960 \text{ km/hr}$$
- (b) $d = 13525 \text{ km}, t = 25 \text{ hours}$

$$\text{Speed} = \frac{d}{t} = \frac{13525}{25} = 541 \text{ km/hr}$$
- (c) $d = 2500 \text{ km}, t = 20 \text{ hr}$

$$\text{Speed} = \frac{d}{t} = \frac{2500}{20} = 125 \text{ km/hr}$$
- (d) $d = 100 \text{ m.}$
 $t = 2 \text{ min } 5 \text{ sec} = (2 \times 60 + 5) \text{ sec} = 125 \text{ sec}$

$$S = \frac{d}{t} = \frac{100}{125} \text{ m/s} = \frac{4}{5} \text{ m/s}$$
- (e) $d = 600 \text{ km}, t = 3 \text{ hr}$

$$S = \frac{d}{t} = \frac{600}{3} \text{ km/hr} = 200 \text{ km/hr}$$



(f) $d = 2500 \text{ km}$

$$t = 1 \text{ hr } 40 \text{ min} = 1\frac{40}{60} \text{ hr} = 1\frac{2}{3} \text{ hr} = \frac{5}{3} \text{ hr}$$

$$\text{speed} = \frac{d}{t} = \frac{2500}{5/3}$$

$$1500 \text{ km/hr} = 2500 \times \frac{3}{5} = 1500 \text{ km/hr}$$

2. (a) Average speed = $\frac{\text{total distance}}{\text{total time}}$

$$\begin{aligned} \therefore \text{Total distance} &= \begin{array}{r} 800 \\ 13525 \\ + 2500 \\ \hline 16825 \text{ km} \end{array} \end{aligned}$$

$$\begin{aligned} \text{total time} &= \frac{50}{60} + 25 + 20 \\ &= \left(\frac{5}{6} + 20 + 25\right) \text{ hr} \\ &= \left(\frac{5}{6} + 45\right) \text{ hr} \\ &= 45\frac{5}{6} \text{ hr} = \frac{275}{6} \text{ hr} \end{aligned}$$

$$\begin{aligned} \therefore \text{Average speed} &= \frac{\text{total distance}}{\text{total time}} \\ &= \frac{16825}{\frac{275}{6}} = \frac{16825 \times 6}{275} \text{ km/hr} \\ &= \frac{100950}{275} \text{ km/hr} \\ &= 367.09 \text{ km/hr} \end{aligned}$$

3. Distance = 280 km

$$\text{time} = 2\frac{1}{2} \text{ hr} = \frac{5}{2} \text{ hr}$$

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{280}{\frac{5}{2}} = \frac{280 \times 2}{5} = \frac{560}{5} \text{ km/hr}$$

\therefore speed of Mr. Gupta = 112 km/hr

Exercise 17.2

1. (a) 144 m/min

$$d = 144 \text{ m}, t = 1 \text{ min} = 60 \text{ sec}$$

$$\begin{aligned} \therefore \text{speed} &= \frac{144}{60} \text{ m/s} \\ &= 2.4 \text{ m/s} \end{aligned}$$

- (b) speed = 270 km/min
 $d = 270 \text{ km}$
 $d = 270000 \text{ m}$
 $t = 1 \text{ min} = 60 \text{ sec}$
 $\therefore \text{speed} = \frac{270000}{60} \text{ m/s}$
 $= 4500 \text{ m/s}$
- (c) speed = 18 km/hr
 $d = 18 \text{ km}$
 $= 18000 \text{ m}$
 $t = 1 \text{ hr} = 3600 \text{ sec}$
 $\text{speed} = \frac{d}{t} = \frac{18000}{3600} \text{ m/s} = 5 \text{ m/s}$
- (d) speed = 400 km/hr
 $d = 400 \text{ km} = 400000 \text{ m}$
 $t = 1 \text{ hr} = 3600 \text{ sec}$
 $\text{speed} = \frac{d}{t} = \frac{400000}{3600} \text{ m/s}$
 $\text{speed} = 111.11 \text{ m/s}$
- (e) speed = 36 km/hr
 $d = 36 \text{ km}$
 $= 36000 \text{ m}$
 $t = 1 \text{ hr} = 3600 \text{ sec}$
 $\text{speed} = \frac{d}{t} = \frac{36000}{3600} \text{ m/s}$
 $= 10 \text{ m/s}$
- (f) speed = 90 km/s
 $d = 90 \text{ km} = 90000 \text{ m}$
 $\text{speed} = \frac{90000}{1} \text{ m/s}$
 $= 90000 \text{ m/s}$
- (g) speed = 198 km/hr
 $d = 198 \text{ km} = 198000 \text{ m}$
 $t = 1 \text{ hr} = 3600 \text{ sec}$
 $\text{speed} = \frac{d}{t} = \frac{198000}{3600} \text{ m/s}$
 $= 55 \text{ m/s}$
- (h) speed = 600 m/s
 $d = 600 \text{ m}$
 $t = 1 \text{ hr} = 3600 \text{ seconds}$
 $\text{speed} = \frac{d}{t} = \frac{600}{3600} \text{ m/s} = \frac{1}{6} \text{ m/s}$
2. (a) speed of car = 180 km/hr
 here $d = 180 \text{ km} = 180000 \text{ m}$

$$t = 1 \text{ hr} = 3600 \text{ sec}$$

$$\therefore \text{ speed of car} = \frac{d}{t} = \frac{180000}{3600} \text{ m/s} \\ = 50 \text{ m/s}$$

(b) speed of bicycle = 54 km/hr

$$\text{here } d = 54 \text{ km} \\ = 54000 \text{ m}$$

$$t = 1 \text{ hr} = 3600 \text{ sec}$$

$$\text{speed} = \frac{d}{t} = \frac{54000}{3600}$$

$$\text{speed of bicycle} = 15 \text{ m/s}$$

(c) $\therefore d = \text{speed} \times \text{time}$

$$\therefore d = 55 \times 8 = 440 \text{ km}$$

$$\therefore \text{ distance covered by van} = 440 \text{ km}$$

(d) speed of spaceship = $\frac{\text{distance}}{\text{time}}$

$$= \frac{570000}{3} \text{ km/hr} = 19000 \text{ km/hr}$$

(e) (i) $d = 2400 \text{ km}$

$$t = 3 \text{ hr } 20 \text{ min} = 3 \frac{20}{60} \text{ hr} = 3 \frac{1}{3} \text{ hr} = \frac{10}{3} \text{ hr}$$

$$\text{speed} = \frac{d}{t} = \frac{2400}{\frac{10}{3}} = \frac{2400 \times 3}{10} = 720 \text{ km/hr}$$

(ii) $d = 2400 \text{ km}$

$$d = 2400000 \text{ m}$$

$$t = 3 \text{ hour } 20 \text{ min}$$

$$= 3 \times 60 + 20 \text{ min}$$

$$= 180 + 20 = 200 \text{ min}$$

$$\therefore \text{ speed} = \frac{d}{t} = \frac{2400000}{200} \text{ m/min} = 12000 \text{ m/min}$$

(iii) $d = 240 \text{ km}$

$$= 240 \times 1000 \text{ m}$$

$$d = 2400000 \text{ m}$$

$$t = 3 \text{ hr } 20 \text{ min}$$

$$= 3 \times 3600 + 20 \times 60 \text{ sec}$$

$$= 10800 + 1200 = 12000 \text{ sec}$$

$$\text{speed} = \frac{d}{t} = \frac{2400000}{12000} = 200 \text{ m/s}$$

Exercise 17.3

(a) speed = 40 m/s time = 20 sec

$$d = \text{speed} \times \text{time}$$

$$= 40 \times 20 = 800 \text{ m}$$

$$\therefore \text{ child runs } 800 \text{ m}$$



(b) speed = 40 km/hr, $t = \text{hr}$

$$d = \text{speed} \times \text{time} \\ = 40 \times 8 = 320 \text{ km}$$

\therefore car travels = 320 km

(c) speed of car = 180 km/hr $d = 700 \text{ km}$

$$t = \frac{d}{s} = \frac{700}{180} \text{ hr} \\ = \frac{700}{180} \times 60 \times \frac{20}{60} \text{ sec} \\ = 700 \times 20 \text{ sec}$$

time taken by car = 14000 sec

(d) speed = 20 m/s $t = 20 \text{ min}$

$$= 20 \times 60 \text{ sec} = 1200 \text{ sec}$$

width of river = distance removed

$$= \text{speed} \times \text{time}$$

$$= 20 \times 1200 \text{ m} = 24000 \text{ m} = 24 \text{ km}$$

(e) speed = 7200 km/hr

$$t = 20 \text{ min } 20 \text{ sec} = 20 \frac{20}{60} \text{ min}$$

$$= 20 \frac{1}{3} \text{ min } \quad t = \frac{61}{3} \text{ min}$$

$$t = \frac{61}{60 \times 3} \text{ hr} \quad t = \frac{61}{180} \text{ hr}$$

distance travel by plane = speed \times time

$$= 7200 \times \frac{61}{180} \text{ km} = \frac{439200}{180} = 2440 \text{ km}$$

(f) speed of man = 50 m/s, $d = 3 \text{ km}$

$$d = 3000 \text{ m}$$

$$\therefore \text{ time taken by man} = \frac{d}{s} = \frac{3000}{50} \text{ sec} = 60 \text{ sec} = 1 \text{ min}$$

(g) distance travelled by bus = speed \times time

$$= 45 \times 6 = 270 \text{ km}$$

(h) speed of Rahul = 15 m/s, $d = 750 \text{ m}$

$$\text{time taken by Rahul} = \frac{d}{s} = \frac{750}{15} \text{ sec} = 50 \text{ sec}$$

(i) speed of Aeroplane = 1350 km/hr

$$= \frac{1350 \times 1000}{3600} \text{ m/s} = \frac{13500}{36} \text{ m/s} = 375 \text{ m/s}$$

$$\text{speed} = 1350 \text{ km/hr, } t = 2 \text{ h } 15 \text{ min} = 2 \frac{15}{60} \text{ hr} = 2 \frac{1}{4} \text{ hr} = \frac{9}{4} \text{ hr}$$

\therefore distance travelled = speed \times time

$$= 1350 \times \frac{9}{4} \text{ km} = 3037.5 \text{ km}$$

(j) distance from Mumbai to Goa = speed \times time
 $= 60 \times 3 = 180$ km
 How speed = 45 km/hr
 Now time taken = $\frac{d}{s} = \frac{180}{45}$ hr = 4 hr

WORKSHEET

Complete the following :	Complete the following :
$\frac{1}{2}$ minute = 30 sec.	$\frac{1}{2}$ km = 500 m
$\frac{1}{4}$ minute = 15 sec.	$\frac{1}{4}$ km = 250 m
$\frac{1}{2}$ hour = 1800 sec.	$\frac{3}{4}$ km = 750 m
$\frac{1}{4}$ hour = 900 sec.	250 km = 250000 m

18. TIM EAND TIME-TABLES

Exercise 18.1

1. (a)
$$\begin{array}{r} 7 : 00 \text{ p m} \\ - 1 : 00 \text{ p m} \\ \hline 6 : 00 \text{ p m} \end{array}$$

 \therefore elapsed time = 6 hr
- (b)
$$\begin{array}{r} 5 : 00 \text{ a m} \\ - 3 : 00 \text{ a m} \\ \hline 2 : 00 \text{ a m} \end{array}$$

 \therefore elapsed time = 2 hrs
- (c)
$$\begin{array}{r} 9 : 30 \text{ p m} \\ - 4 : 00 \text{ p m} \\ \hline 5 : 30 \text{ a m} \end{array}$$

 \therefore elapsed time = 5 hr 30 min
- (d)
$$\begin{array}{r} 8 : 00 \text{ p m} \\ - 6 : 45 \text{ p m} \\ \hline 1 : 15 \text{ a m} \end{array}$$

 \therefore elapsed time = 1 hr 15 min
- (e)
$$\begin{array}{r} 3:30 \text{ pm} = 1530 \text{ hr} \\ 10:00 \text{ am} = -1000 \text{ hr} \\ \hline 530 \text{ hr} \end{array}$$

 \therefore elapsed time = 5 hr 30 min
- (f)
$$\begin{array}{r} 8:00 \text{ pm} = 2000 \text{ hr} \\ 6:30 \text{ am} = -0630 \text{ hr} \\ \hline 1330 \text{ hr} \end{array}$$

 \therefore elapsed time = 13 hr 30 min
2. (a) for 3 minutes walking takes 1 day
 for 1 minutes walking takes = $\frac{1}{3}$ day
 for 60 minutes walking takes = $\frac{60}{3}$ days = 20 days
- (b) for $\frac{1}{2}$ hr jog takes = 1 day
 for 1 hr jog takes = 2 days
 for 24 hr jog takes = 2×24 days = 48 days



2. (a) here

$$P = ₹ 10,000 \quad r = 6\frac{1}{2}\% = \frac{13}{2}\% ; \quad t = 4 \text{ years}$$

$$I = \frac{P \times r \times t}{100} = \frac{10000 \times 13 \times 4}{100 \times 2}$$

$$I = 2600$$

$$A = P + I$$

$$= 10000 + 2600$$

$$A = ₹ 12600$$

(b) here $P = ₹ 2500$

$$r = 12\frac{1}{2}\% = \frac{25}{2}\%$$

$$t = 10 \text{ years}$$

$$I = \frac{P \times r \times t}{100} = \frac{2500 \times 25 \times 10}{100 \times 2}$$

$$I = 3125$$

$$\therefore A = P + I$$

$$= 2500 + 3125$$

$$A = ₹ 5625$$

3.

Item	Rate	Quantity	Cost
beds	₹ 18750	3	$18750 \times 3 = 56,250$
small tables	₹ 3700	4	$3700 \times 4 = 14,800$
chairs	₹ 875	12	$875 \times 12 = 10,500$
dressing table	₹ 9410	3	$9410 \times 3 = 28,230$
television	₹ 7850	4	$7850 \times 4 = 31,400$
			Total Cost = ₹ 1,41,180

4. (a) $\text{Average} = \frac{\text{total}}{\text{number}} = \frac{23 + 36 + 19 + 22 + 10}{5} = \frac{110}{5} = ₹ 22$

(b) $\text{Average} = \frac{\text{total}}{\text{number}} = \frac{5 + 10 + 15 + 20}{4} = \frac{50}{4} = 12.5 \text{ cm}$

5. (a) $d = \text{speed} \times \text{time}$

$$\text{distance} = 27 \times 6 \text{ km} = 162 \text{ km}$$

(b) $\text{distance} = \text{speed} \times \text{time}$

$$= 100 \times 5$$

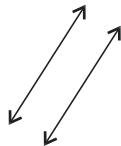
$$\text{distance} = 500 \text{ m}$$

6. $\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{120}{15} \text{ m/s} = 8 \text{ m/s}$
7. here $P = ₹ 1000$ $r = 5\%$ $t = 5$ years
 $\therefore I = \frac{P \times r \times t}{100} = \frac{1000 \times 5 \times 5}{100} = ₹ 250$
 \therefore His brother pay ₹ 250 as interest to Sameer.
8. 20 m/s here $d = 20 \text{ m} = \frac{20}{1000} \text{ km}$ $t = 1 \text{ sec} = \frac{1}{3600} \text{ hr}$
 $\therefore \text{speed} = \frac{d}{t} = \frac{20}{\frac{1}{3600}} \text{ km/hr} = \frac{20}{1000} \times \frac{3600}{1} \text{ km/hr}$
 $\text{speed} = 72 \text{ km/hr}$
9. CP of T.V. = ₹ 23,526 SP = ₹ 15876
 $l = \text{CP} - \text{SP}$
 $= 23526 - 15876$
 $l = 7650$
 $l\% = \frac{l}{\text{CP}} \times 100 = \frac{7650}{23526} \times 100$
 $l\% = 32.51\%$
10. Here $P = ₹ 12000$ $r = 6\frac{1}{2}\% = \frac{13}{2}\%$, $t = 5$ years
 $\therefore I = \frac{P \times r \times t}{100}$
 $\therefore I = \frac{12000 \times 13 \times 5}{100 \times 2} = 60 \times 13 \times 5$
 $I = ₹ 3900$
11. (a) Volvo bus leave Delhi at 15:30 hrs.
 (b) distance between Delhi and Katra is 631 km.
 (c) difference in fare is ₹ $(700 - 324) = ₹ 376$
 (d) ordinary bus starts from Delhi at 13:14 hrs.
12. $\text{speed} = 180 \text{ km/hr}$
 $= \frac{180 \times 1000}{3600} \text{ m/s} = \frac{1800}{36} \text{ m/s}$
 $\text{speed} = 50 \text{ m/s}$

19. Lines and angles

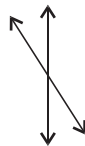
Exercise 19.1

1. (a)



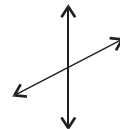
Paralls lines

(b)

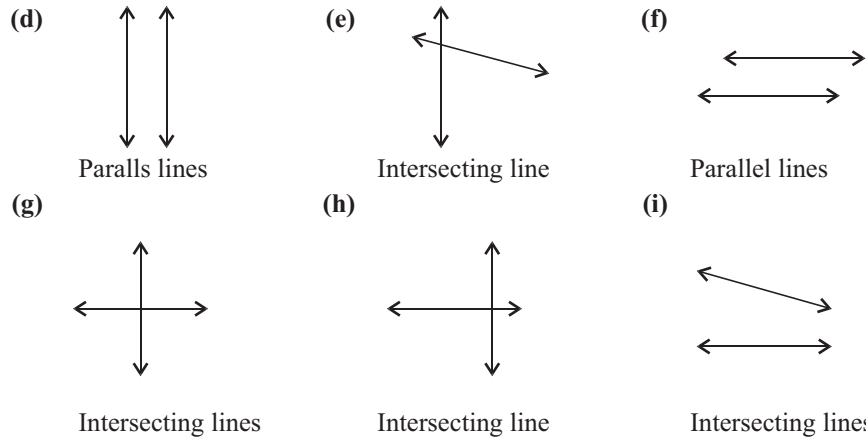


Intersecting line

(c)



Intersecting line



2. (a) Line that intersect at right angles are called **perpendicular** lines.
 (b) **Parallel** lines do not meet.
 (c) The opposite sides of a rectangle are **Parallel**.
 (d) The letter T has **perpendicular** lines.
3. (a) Name a line segment with A as end point. \overline{AC}
 (b) Name a line. \overleftrightarrow{GH}
 (c) Name a ray. \overrightarrow{DE}
 (d) Name the different line segments in the figure $\overline{DE}, \overline{BC}, \overline{AB}, \overline{BD}$

4. line segment have two end point where as ray has onlyone end point.

5. (a) $\overline{AB}, \overline{BC}, \overline{AC}$
 (b) $\overline{AB}, \overline{BC}, \overline{CD}, \overline{DE}, \overline{EA}$
 (c) $\overline{AB}, \overline{BC}, \overline{CD}, \overline{DE}, \overline{EF}, \overline{FG}, \overline{GH}, \overline{HA}$
 (d) $\overline{AB}, \overline{BC}, \overline{CD}, \overline{DE}, \overline{EF}, \overline{FA}$

6. Railway track are parallel edges of door are perpendicular.



8. (a) $\overline{AB} = 10.5 \text{ cm}$








 (b) $\overline{CD} = 5.3 \text{ cm}$

 (c) $\overline{EF} = 4.8 \text{ cm}$

 (d) $\overline{GH} = 3.5 \text{ cm}$

 (e) $\overline{IJ} = 2.9 \text{ cm}$

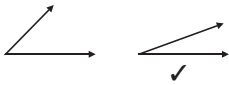
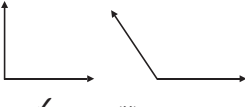
Exercise 19.2

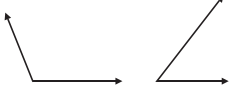
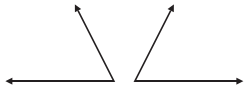
1. (a)  (b)  (c)  (d) 
- (e)  (f)  (g) 

2. $\angle AOB, \angle AOC, \angle BOC \therefore$ there are three angles yes all of them have common vertex O .
3. (a) $\angle ABC$ is given angle
 (b) interior points are x, y, z
 (c) exterior points are L, M, N
 (d) E, B, F are on $\angle ABC$.

Exercise 19.3

1. (a) 45° acute (b) 105° obtuse (c) 25° acute
 (d) 120° obtuse (e) 90° right angle (f) 160° obtuse
2. (a) $\angle A = 87^\circ, \angle B = 110^\circ, \angle C = 90^\circ, \angle D = 73^\circ$
 (b) $\angle E = \angle F = \angle G = \angle H = 90^\circ$
 (c) $\angle J = 60^\circ, \angle K = 70^\circ, \angle L = 50^\circ$
 (d) $\angle LNM = 150^\circ, \angle MNO = 30^\circ, \angle OHP = 45^\circ, \angle PNL = 135^\circ, \angle LNO = 180^\circ$
 (e) $\angle XUW = 60^\circ, \angle WUV = 80^\circ, \angle VUY = 40^\circ, \angle XUV = 140^\circ, \angle WUY = 120^\circ, \angle XUY = 180^\circ$
 (f) $\angle HIE = 120^\circ, \angle EIF = 60^\circ, \angle FIG = 120^\circ, \angle GIH = 60^\circ, \angle HIF = 180^\circ, \angle GIE = 180^\circ$

3. (a)  (i) (b)  (ii)

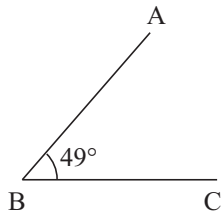
- (c)  (i) (d)  (ii)

- (e) equal

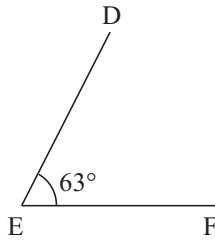


Exercise 19.4

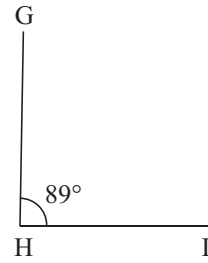
1. (a)



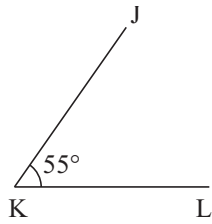
(b)



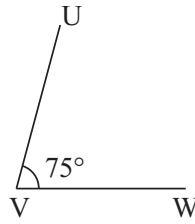
(c)



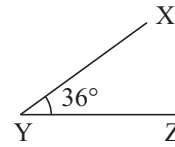
(d)



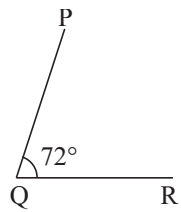
(e)



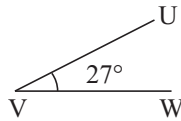
(f)



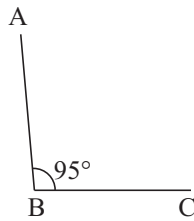
(g)



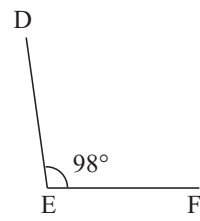
(h)



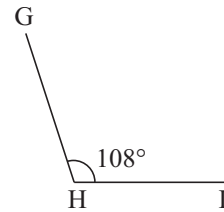
2. (a)



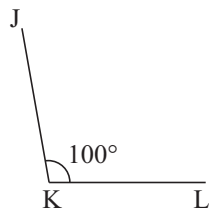
(b)



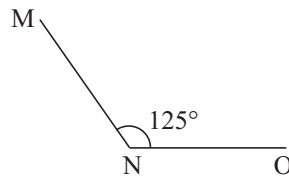
(c)



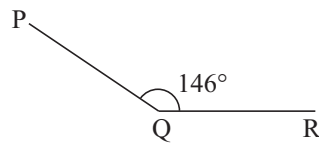
(d)



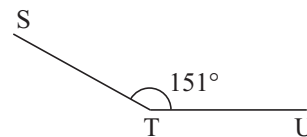
(e)



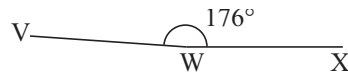
(f)



(g)



(h)



3. (a) An 150° angle is an **obtuse** angle.
(b) A **obtuse** angle is greater than an 90° angle but less than an 180° angle.
(c) A right angle measures 90° .
(d) A straight angle always measures 180° .
(e) The point where the two line segments meet to form an angle is called the **vertex**.
(f) Angles are measured with the help of a **protector**.

Exercise 19.5

1. (a) The complementary angle of 65° is $90 - 65 = 25^\circ$.
(b) The supplementary angle of 45° is $180 - 45 = 135^\circ$.
(c) The complementary angle of 45° is $90 - 45 = 45^\circ$.
(d) The supplementary angle of 130° is $180^\circ - 135^\circ = 45^\circ$.
(e) The measurement of a straight angle is 180° .
(f) The measurement of right angle is 90° .
(g) Vertically opposite angles are always **equal**.
(h) The angles whose sum is equal to 90° are called **complementary angles**.
(i) The sum of supplementary angles is 180° .

20. TRIANGLES AND QUADRILATERALS

Exercise-20.1

1. (a) acute angle triangle (b) obtuse angle triangle (c) right angle triangle
2. (a) isosceles triangle (b) scalene triangles (c) equilateral triangles
3. (a) sides are 2.8 cm, 2.8 cm, 2.8 cm Equilateral triangle
Angles are $60^\circ, 60^\circ, 60^\circ \therefore$ Acute angled triangle
(b) sides are 3.2 cm, 3.3 cm, 4.6 cm Scalene triangle
Angles are $110^\circ, 30^\circ, 40^\circ \therefore$ Obtuse angled triangle
(c) sides are 1.5 cm, 3.5 cm, 3.7 cm Scalene triangle
Angles are $90^\circ, 25^\circ, 65^\circ \therefore$ Right angled triangle
(d) Sides are 1.7 cm, 3.5 cm, 3.7 cm Scalene triangle
angles are $90^\circ, 65^\circ, 25^\circ \therefore$ Right angled triangle
(e) sides are 2.8 cm, 3.3 cm, 3.6 cm angles Scalene triangle
Angles are $50^\circ, 60^\circ, 70^\circ \therefore$ Acute angled triangle
(f) sides are 2.6 cm, 2.6 cm, 3.6 cm angles Scalene triangle
Angles are $90^\circ, 45^\circ, 45^\circ \therefore$ Right angled triangle
(g) Sides are 1.3 cm, 4.6 cm 4.8 cm Scalene triangle
angles are $90^\circ, 15^\circ, 75^\circ \therefore$ Right angled triangle
4. (a) one (b) one (c) three
(d) two (e) none.

