

6 Basics of Geometry

1. Write down the following symbols :

a. Line segment CD $\rightarrow \overline{CD}$

b. Ray GH $\rightarrow \overrightarrow{GH}$

c. Straight line EF $\rightarrow \overleftrightarrow{EF}$

d. Ray AB $\rightarrow \overrightarrow{AB}$

2. Fill in the blanks :

a. line segment

b. ray

c. line

d. line

e. plane

3. Match the columns :

a. A line segment has

i. no end points.

b. A straight line has

ii. no length or breadth.

c. A line segment has

iii. two end points.

d. A black board

iv. represents a part of a plane.

e. A point has

v. has a definite length.

Exercise 6.2

1. Fill in the blanks :

a. ray

b. line

c. line segment, definite

d. 90°

e. 180°

f. refer angle

g. complementary angles

h. 180°

i. congruent angles j. always equal

k. vertex

l. congruent

2. State whether the angles in each of the following is acute, right, obtuse or reflex :

a. Actue

b. Right angle

c. Obtuse angle

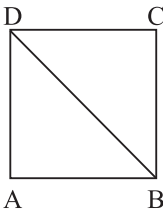
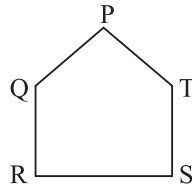
d. Reflex angle

e. Acute angle

f. Acute angle

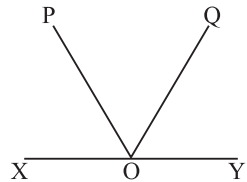
3. Name the angles in the following figures :

a. $\angle PQR$, $\angle QRS$, $\angle RST$, $\angle STP$ and $\angle TPQ$ are the angles of the figure a.

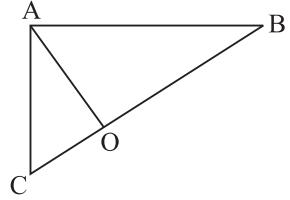


b. $\angle DAB$, $\angle ABD$, $\angle BDA$, $\angle BDC$, $\angle DCB$ and $\angle CBD$ are the angles of figure b.

c. $\angle XOP$, $\angle XOQ$, $\angle XOY$, $\angle POQ$, $\angle POY$ and $\angle QOY$ are the angles of the figure c.



- d. $\angle AOC$, $\angle ACB$, $\angle AOB$, $\angle OBA$, $\angle BAO$
and $\angle CAO$ are the angles of the figure d.



4. Find out the complementary angle of the following :

Ans. The complementary angle of an angle $\theta^\circ = 90^\circ - \theta^\circ$

- The complementary angle of an angle $60^\circ = 90^\circ - 60^\circ = 30^\circ$
- The complementary angle of an angle $45^\circ = 90^\circ - 45^\circ = 45^\circ$
- The complementary angle of an angle $25^\circ = 90^\circ - 25^\circ = 65^\circ$
- The complementary angle of an angle $15^\circ = 90^\circ - 15^\circ = 75^\circ$
- The complementary angle of an angle $80^\circ = 90^\circ - 80^\circ = 10^\circ$
- The complementary angle of an angle $40^\circ = 90^\circ - 40^\circ = 50^\circ$
- The complementary angle of an angle $75^\circ = 90^\circ - 75^\circ = 15^\circ$

5. Find out the supplementary angle of the following :

The supplementary angle of an angle $\theta^\circ = 180^\circ - \theta^\circ$

- The supplementary angle of an angle $30^\circ = 180^\circ - 30^\circ = 150^\circ$
- The supplementary angle of an angle $45^\circ = 180^\circ - 45^\circ = 135^\circ$
- The supplementary angle of an angle $75^\circ = 180^\circ - 75^\circ = 105^\circ$
- The supplementary angle of an angle $90^\circ = 180^\circ - 90^\circ = 90^\circ$
- The supplementary angle of an angle $105^\circ = 180^\circ - 105^\circ = 75^\circ$
- The supplementary angle of an angle $135^\circ = 180^\circ - 135^\circ = 45^\circ$
- The supplementary angle of an angle $150^\circ = 180^\circ - 150^\circ = 30^\circ$
- The supplementary angle of an angle $165^\circ = 180^\circ - 165^\circ = 15^\circ$

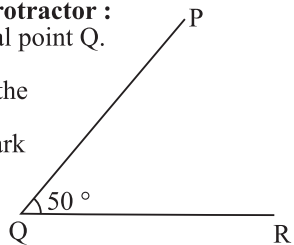
6. Fill in the blanks :

- | | | | |
|-----------|-------------|-----------|-----------|
| a. acute | b. straight | c. right | d. obtuse |
| e. obtuse | f. acute | g. reflex | h. obtuse |
| i. acute | j. reflex | k. acute | |

Exercise 6.3

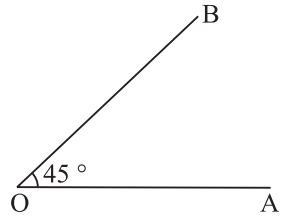
Construct the following angles with the help of a protractor :

- Construction :** 1. Draw a ray QR with initial point Q.
2. Place the protractor on the line QR such that the centre of the protractor fixes on the point Q.
3. Start from 0° read the outer scale and mark the point P on the required angle 50° .
4. Remove the protractor and join PQ.
5. $\angle PQR$ is the required angle.

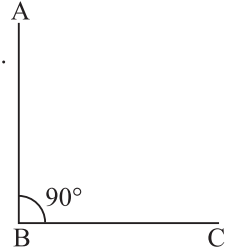


- Construction :** 1. Draw a ray OA with initial point O.
2. Place the protractor on the line OA such that the centre of the protractor fixes on the point O.

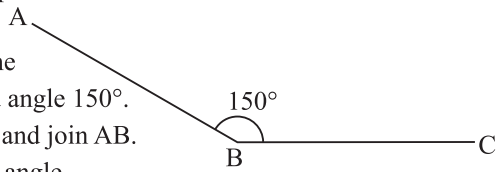
- Start from 0° read the outer scale and mark the point B on the required angle 45° .
- Remove the protractor and join OB.
- $\angle AOB$ is the required angle.



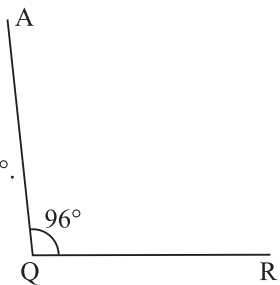
- c. **Construction :**
- Draw a ray BC with initial point B.
 - Place the protractor on the line BC such that the centre of the protractor fixes on the point B.
 - Start from 0° read the outer scale and mark the point A on the required angle 90° .
 - Remove the protractor and join AB.
 - $\angle ABC$ is the required angle.



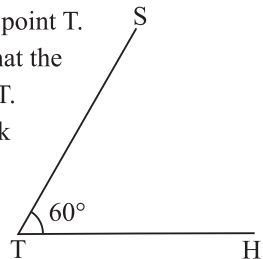
- d. **Construction :**
- Draw a ray BC with initial point B.
 - Place the protractor on the line BC such that the centre of the protractor fixes on the point B.
 - Start from 0° read the outer scale and mark the point A on the required angle 150° .
 - Remove the protractor and join AB.
 - $\angle ABC$ is the required angle.



- e. **Construction :**
- Draw a ray QR with initial point Q.
 - Place the protractor on the line QR such that the centre of the protractor fixes on the point Q.
 - Start from 0° read the outer scale and mark the point A on the required angle 96° .
 - Remove the protractor and join AQ.
 - $\angle AQR$ is the required angle.



- f. **Construction :**
- Draw a ray TH with initial point T.
 - Place the protractor on the line TH such that the centre of the protractor fixes on the point T.
 - Start from 0° read the outer scale and mark the point S on the required angle 60° .
 - Remove the protractor and join ST.
 - $\angle STH$ is the required angle.



g. **Construction :** 1. Draw a ray YZ with initial point Y.

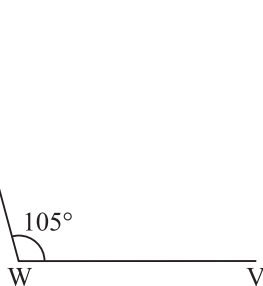
2. Place the protractor on the line YZ such that the centre of the protractor fixes on the point Y.
3. Start from 0° read the outer scale and mark the point X on the required angle 130° .



4. Remove the protractor and join XY.
5. $\angle XYZ$ is the required angle.

h. **Construction :** 1. Draw a ray WV with initial point W.

2. Place the protractor on the line WV such that the centre of the protractor fixes on the point W.
3. Start from 0° read the outer scale and mark the point T on the required angle 105° .



4. Remove the protractor and join TW.
5. $\angle TWV$ is the required angle.

i. **Construction :** 1. Draw a ray PQ with initial point P.

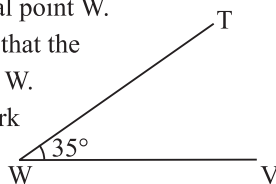
2. Place the protractor on the line PQ such that the centre of the protractor fixes on the point P.
3. Start from 0° read the outer scale and mark the point M on the required angle 140° .



4. Remove the protractor and join MP.
5. $\angle MPQ$ is the required angle.

j. **Construction :** 1. Draw a ray WV with initial point W.

2. Place the protractor on the line WV such that the centre of the protractor fixes on the point W.
3. Start from 0° read the outer scale and mark the point T on the required angle 35° .



4. Remove the protractor and join WV.
5. $\angle TWV$ is the required angle.

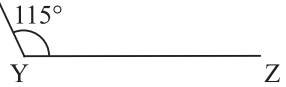
k. **Construction :** 1. Draw a ray YZ with initial point Y.

2. Place the protractor on the line X
YZ such that the centre of the
protractor fixes on the point Y.

3. Start from 0° read the outer scale
and mark the point X on the required
angle 115° .

4. Remove the protractor and join XY.

5. $\angle XYZ$ is the required angle.



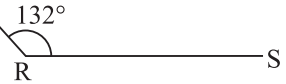
l. **Construction :** 1. Draw a ray RS with initial point R.

2. Place the protractor on
the line RS such that the
centre of the protractor fixes
on the point R.

3. Start from 0° read the outer scale
and mark the point Q on the required
angle 132° .

4. Remove the protractor and join QR.

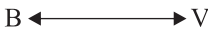
5. $\angle QRS$ is the required angle.



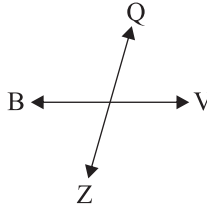
Exercise 6.4

1. **Draw and label an example of each :**

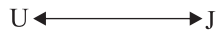
a.



b.



c.



2. **Classify each pair of lines as parallel, intersecting, or perpendicular.**

a. Intersecting lines

b. Parallel lines

c. Intersecting lines

d. Parallel lines

3. **Put a tick (✓) on the parallel lines :**

a. ✓

b. ✗

c. ✗

d. ✓

e. ✗

f. ✓

MCQs

Tick (✓) the correct option :

Ans. 1. iii

2. iv

3. ii

4. ii

5. iii

6. i

7. i



7 Triangles

1. Whether the following angles forms a triangle or not?

Ans. Sum of three angles of triangle is 180° .

a. Sum of three angles = $45^\circ + 60^\circ + 75^\circ = 180^\circ$

So, they form a triangle.

b. Sum of three angles = $90^\circ + 90^\circ + 10^\circ = 190^\circ > 180^\circ$

So, they do not form a triangle.

c. Sum of three angles = $55^\circ + 95^\circ + 30^\circ = 180^\circ$

So, they form a triangle.

d. Sum of three angles = $120^\circ + 30^\circ + 30^\circ = 180^\circ$

So, they form a triangle.

2. Find out the third angle of a triangle, if two of them are given :

Ans. a. Third angle of a triangle = $180^\circ - (65^\circ + 35^\circ)$

= $180^\circ - 100^\circ = 80^\circ$

b. Third angle of a triangle = $180^\circ - (39^\circ + 60^\circ) = 180^\circ - 99^\circ$

= 81°

c. Third angle of a triangle = $180^\circ - (60^\circ + 28.5^\circ) = 180^\circ - 88.5^\circ$

= 91.5°

d. Third angle of a triangle = $180^\circ - (90^\circ + 30^\circ) = 180^\circ - 120^\circ$

= 60°

e. Third angle of a triangle = $180^\circ - (60^\circ + 60^\circ) = 180^\circ - 120^\circ$

= 60°

f. Third angle of a triangle = $180^\circ - (150^\circ + 20^\circ) = 180^\circ - 170^\circ$

= 10°

g. Third angle of a triangle = $180^\circ - (130^\circ + 30^\circ) = 180^\circ - 160^\circ$

= 20°

h. Third angle of a triangle = $180^\circ - (120^\circ + 15^\circ) = 180^\circ - 135^\circ$

= 45°

3. Is the triangle possible with the following sides given? (Write your answer in 'Yes' or 'No') :

Ans. a. Yes b. Yes c. Yes d. No e. Yes f. Yes g. Yes h. Yes

Exercise 7.2

1. Fill in the blanks :

Ans. a. Obtuse triangle

b. Right triangle

c. Obtuse

d. tree

e. 180°

f. Scalene

g. equal

h. equilateral

i. acute triangle

j. right

k. three

l. two

2. Name and count the triangles in each of the following figures :

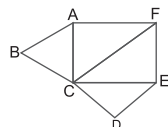
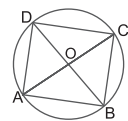
Ans. a. There are 8 Δ in figure a.

ΔAOB , ΔBOC , ΔABC , ΔABD , ΔAOD , ΔDOC ,

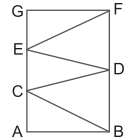
ΔBCD and ΔCDA

b. There are 4 triangles in figure b.

ΔABC , ΔACF , ΔCEF and ΔCDE .



- c. There are 5 triangles in figure C.
 ΔABC , ΔBCD , ΔCDE , ΔDEF and ΔEFG .



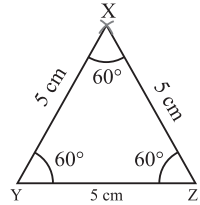
3. Write the name of the triangle in the given figures :

- Ans.** a. Obtuse triangle b. Acute triangle

Exercise 7.3

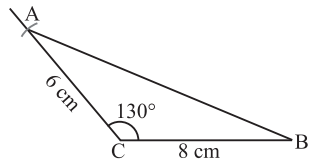
Construct the following triangles in your note book :

- 1. Construction :**
1. Draw a line segment YZ of the given length 5 cm.
 2. Place your compass on one end of the line segment and cut an arc with the required length 5 cm.



3. Repeat the process with the other end of the line segment so that both the arcs intersect at point X.
4. Join the ends of the line segment Y, Z to the point of intersection X to form the given equilateral triangle.

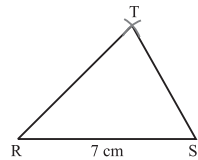
- 2. Construction :**
1. Draw a line segment BC of the length 8 cm.
 2. Using protractor, draw the required angle 130° at point C of the line segment.



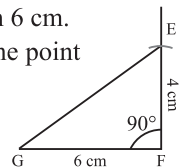
3. Cut off the length of the second side 6 cm.
4. Join the point of intersection A to the opposite end B of the line segment to form the required triangle. ABC is the required triangle.

3. Construction :

1. Draw the base RS of the triangle of the required length 7 cm.
2. From the two ends of the line segment cut arcs of the required measurements such that they intersect each other at point T.
3. Join R, S the ends of the base line segment to T the point of intersection of the arcs. TRS is the required triangle.

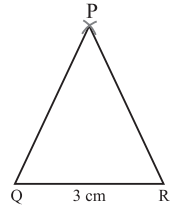


- 4. Construction :**
1. Draw a line segment FG of the length 6 cm.
 2. Using protractor, draw 90° angle at the point F of the line segment FG.
 3. Cut off the length 4 cm of the second side.

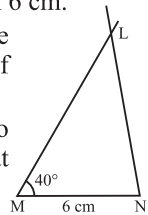


4. Join the point of intersection E to the opposite end G of the line segment to form the triangle.
EFG is the required triangle.

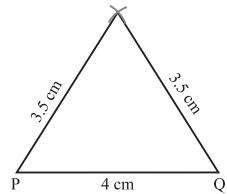
5. **Construction :**
1. Draw the line segment QR of the length 3 cm.
 2. From the two points Q and R of the line segment cut arcs of the length 4 cm each such that they intersect each other at point I.
 3. Join the points R and S of the base line to T the point of intersection of arcs. PQR is the required triangle.



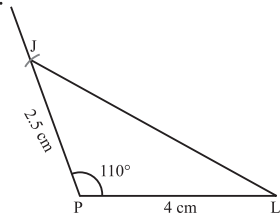
6. **Construction :**
1. Draw the line segment MN of the length 6 cm.
 2. Using protractor, draw 60° angle at the point M and 80° angle at the point N of the line segment.
 3. Join the lines so that they intersect to form the third vertex of the triangle at the point L.
- LMN is the required triangle.



7. **Construction :**
1. Draw the line segment PQ of the length 4 cm.
 2. From both ends P and Q of the line segment cut arcs of the length 3.5 cm such that they intersect each other at point O.
 3. Join the point P and point Q of the line segment to the point of intersection O.
- OPQ is the required triangle.



8. **Construction :**
1. Draw a line segment KL of the length 6 cm.
 2. Using protractor draw 110° angle at the point K of the line segment KL.
 3. Cut off 2.5 cm length of the second side JK.
 4. Join the point of intersection J to the point of the line segment L to form the required triangle.
- Δ JKL is the required triangle.



MCQs

Tick (✓) the correct option :

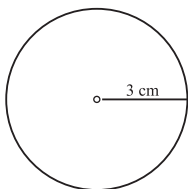
- Ans. 1. ii 2. iii 3. iii 4. i 5. iv 6. ii 7. i

8 Circles

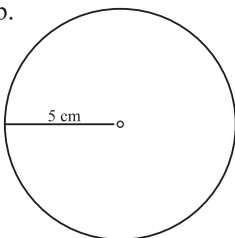
Exercise 8.1

1. Construct circles with the following radii using a compass :

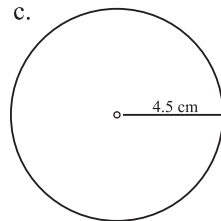
Ans. a.



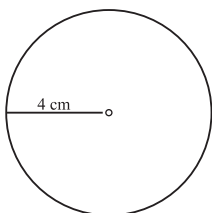
b.



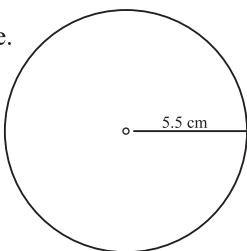
c.



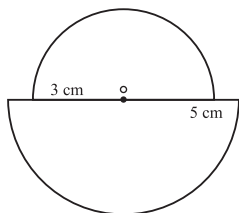
d.



e.



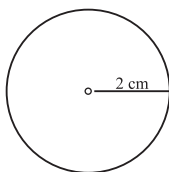
2.



3. Draw a circle with the given radius and calculate the diameter in each case :

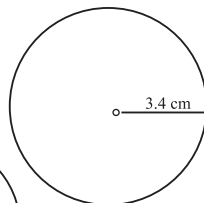
Ans. a. Radius = 2 cm

$$\begin{aligned} \therefore \text{Diameter} &= 2 \times \text{radius} \\ &= 2 \times 2 = \mathbf{4 \text{ cm}} \end{aligned}$$



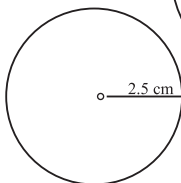
b. Radius = 3.4 cm

$$\begin{aligned} \therefore \text{Diameter} &= 2 \times \text{radius} \\ &= 2 \times 3.4 = \mathbf{6.8 \text{ cm}} \end{aligned}$$

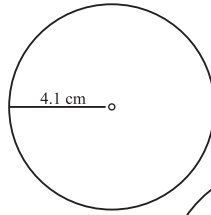


c. Radius = 2.5 cm

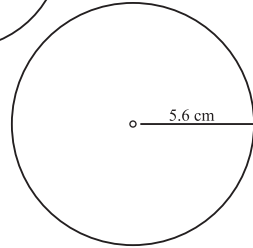
$$\begin{aligned} \therefore \text{Diameter} &= 2 \times \text{radius} \\ &= 2 \times 2.5 = 5.0 \text{ cm} \\ &= \mathbf{5 \text{ cm}} \end{aligned}$$



- d. Radius = 4.1
 \therefore Diameter = $2 \times$ radius
 $= 2 \times 4.1 = 8.2$ cm

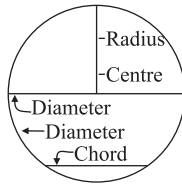


- e. Radius = 5.6 cm
 \therefore Diameter = $2 \times$ radius
 $= 2 \times 5.6$ cm
 $= 11.2$ cm



4. Draw a circle in your notebook and mark the following on it :

- Ans. a. Centre
 b. Radius
 c. Chord
 d. Diameter
 e. Circumference



5. Fill in the blanks :

- Ans. a. chord b. half c. edge d. half
 e. circumference

6. Which of the given groups of circles are concentric :

- Ans. a. ✓

MCQs

Tick (✓) the correct option :

- Ans. 1. iii 2. iv 3. iii 4. ii



9 Circles

Exercise 9.1

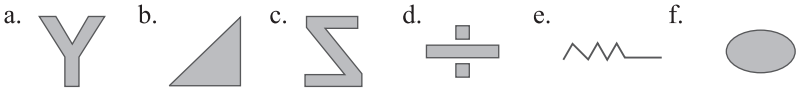
1. Rotate the given figures in clockwise direction (in three steps) :

- a. b.
 c. d.
 e. f.

2. Rotate the given figures in anticlockwise direction :

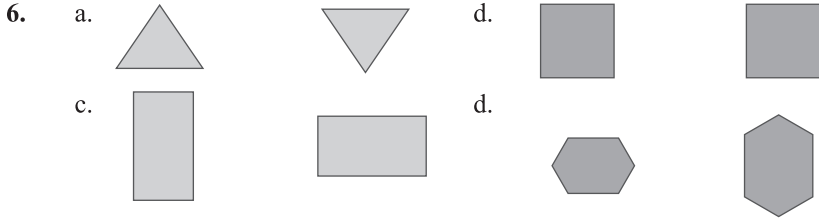
- a. b. c.

3. Draw the figure after the reflection to the following figures :



4. The following letters in the English alphabet look the same after a turn.
H, I, N, O, S, X and Z.

5. 0 and 8 from 0 to 9 still look the same after half a turn.



MCQs

Tick (✓) the correct option :

Ans. 1. iv 2. iii 3. i 4. i 5. i

10 The Metric System

Exercise 10.1

1. Express in cm :

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

- a. $3.16 \text{ m} = 3.16 \times 100 \text{ cm} = \mathbf{316 \text{ cm}}$
 b. $3.42 \text{ m} = 3.42 \times 100 \text{ cm} = \mathbf{342 \text{ cm}}$
 c. $7.75 \text{ m} = 7.75 \times 100 \text{ cm} = \mathbf{775 \text{ cm}}$
 d. $27.076 \text{ m} = 27.076 \times 100 \text{ cm} = \mathbf{2707.6 \text{ cm}}$
 e. $42.44 \text{ m} = 42.44 \times 100 \text{ cm} = \mathbf{4244 \text{ cm}}$
 f. $75.08 \text{ m} = 75.08 \times 100 \text{ cm} = \mathbf{7508 \text{ cm}}$
 g. $0.009 \text{ m} = 0.009 \times 100 \text{ cm} = \mathbf{0.9 \text{ cm}}$
 h. $367.5 \text{ m} = 367.5 \times 100 \text{ cm} = \mathbf{36750 \text{ cm}}$

2. Express in hm :

$$1 \text{ km} = 10 \text{ hm}$$

- a. $2.355 \text{ km} = 2.355 \times 10 \text{ hm} = \mathbf{23.55 \text{ hm}}$
 b. $47.86 \text{ km} = 47.86 \times 10 \text{ hm} = \mathbf{478.6 \text{ hm}}$
 c. $35.250 \text{ km} = 35.25 \times 10 \text{ hm} = \mathbf{352.50 \text{ hm}}$
 d. $9.003 \text{ km} = 9.003 \times 10 \text{ hm} = \mathbf{90.03 \text{ hm}}$
 e. $7.075 \text{ km} = 7.075 \times 10 \text{ hm} = \mathbf{70.75 \text{ hm}}$
 f. $7.878 \text{ km} = 7.878 \times 10 \text{ hm} = \mathbf{78.78 \text{ hm}}$
 g. $0.9 \text{ km} = 0.9 \times 10 \text{ hm} = \mathbf{9 \text{ hm}}$
 h. $0.104 \text{ km} = 0.104 \times 10 \text{ hm} = \mathbf{1.04 \text{ hm}}$

3. Express in dag :

1 kg = 10 dag

- a. $3.127 \text{ kg} = 3.127 \times 100 \text{ dag} = \mathbf{12.7 \text{ dag}}$
- b. $7.779 \text{ kg} = 7.779 \times 100 \text{ dag} = \mathbf{777.9 \text{ dag}}$
- c. $96.750 \text{ kg} = 96.750 \times 100 \text{ dag} = \mathbf{9675.0 \text{ dag}}$
- d. $0.358 \text{ kg} = 0.358 \times 100 \text{ dag} = \mathbf{35.8 \text{ dag}}$
- e. $8.65 \text{ kg} = 8.65 \times 100 \text{ dag} = \mathbf{865 \text{ dag}}$
- f. $84.050 \text{ kg} = 84.050 \times 100 \text{ dag} = \mathbf{8405.0 \text{ dag}}$
- g. $7.392 \text{ kg} = 7.392 \times 100 \text{ dag} = \mathbf{739.2 \text{ dag}}$
- h. $7.392 \text{ kg} = 7.392 \times 100 \text{ dag} = \mathbf{739.2 \text{ dag}}$

4. Express in mg :

1g = 1000 mg

- a. $3.164 \text{ g} = 3.164 \times 1000 \text{ mg} = \mathbf{3164 \text{ mg}}$
- b. $0.185 \text{ g} = 0.185 \times 1000 \text{ mg} = \mathbf{185 \text{ mg}}$
- c. $9.009 \text{ g} = 9.009 \times 1000 \text{ mg} = \mathbf{9009 \text{ mg}}$
- d. $17.06 \text{ g} = 17.06 \times 1000 \text{ mg} = \mathbf{17060 \text{ mg}}$
- e. $5.570 \text{ g} = 5.570 \times 1000 \text{ mg} = \mathbf{5570 \text{ mg}}$
- f. $97.450 \text{ g} = 97.450 \times 1000 \text{ mg} = \mathbf{97450 \text{ mg}}$
- g. $0.008 \text{ g} = 0.008 \times 1000 \text{ mg} = \mathbf{8 \text{ mg}}$
- h. $0.950 \text{ g} = 0.950 \times 1000 \text{ mg} = \mathbf{950 \text{ mg}}$

5. Express in dl :

1 l = 10 dl

- a. $6.542 \text{ l} = 6.542 \times 10 \text{ dl} = \mathbf{65.42 \text{ dl}}$
- b. $32.7650 \text{ l} = 32.750 \times 10 \text{ dl} = \mathbf{327.50 \text{ dl}}$
- c. $8.616 \text{ l} = 8.616 \times 10 \text{ dl} = \mathbf{86.16 \text{ dl}}$
- d. $0.5 \text{ l} = 0.5 \times 10 \text{ dl} = \mathbf{5 \text{ dl}}$
- e. $38.950 \text{ l} = 38.950 \times 10 \text{ dl} = \mathbf{389.50 \text{ dl}}$
- f. $0.25 \text{ l} = 0.25 \times 10 \text{ dl} = \mathbf{2.5 \text{ dl}}$
- g. $9.65 \text{ l} = 9.65 \times 10 \text{ dl} = \mathbf{96.5 \text{ dl}}$
- h. $6.003 \text{ l} = 6.003 \times 10 \text{ dl} = \mathbf{60.03 \text{ dl}}$

Exercise 10.2

1. Fill in the blanks :

- a. 25 km 277 m
- b. 22 hg 9 hg
- c. 189l 7dl 3 cl
- d. 0.789 cm

2. Add the following :

a. $15 \text{ g } 380 \text{ mg} + 30 \text{ g}$
 $= 45 \text{ g } 380 \text{ mg}$

k/	l
⓪	
15	380
+30	000
45	380

b. $10 \text{ k/ } 222 \text{ l} + 9 \text{ k/ } 1000 \text{ l}$
 $= 20 \text{ k/ } 222 \text{ l}$

k/	l
⓪	
10	222
+ 9	1000
20	222

$$\begin{aligned} \text{c. } & 24 \text{ m } 40 \text{ mm} + 16 \text{ m } 985 \text{ mm} \\ & + 235 \text{ mm} = 43 \text{ m } 260 \text{ mm} \end{aligned}$$

m	mm
24	525
16	750
+ 2	900
43	175

$$\begin{aligned} \text{d. } & 5 \text{ l } 525 \text{ ml} + 750 \text{ ml} \\ & + 10 \text{ l } 900 \text{ ml} = 17 \text{ l } 175 \text{ ml} \end{aligned}$$

l	ml
5	525
0	750
+10	900
17	175

3. Subtract the following :

$$\begin{aligned} \text{a. } & 15 \text{ cm } 2 \text{ m} - 12 \text{ cm } 1 \text{ mm} \\ & = 3 \text{ cm } 1 \text{ mm} \end{aligned}$$

cm	mm
15	380
- 30	000
45	380

$$\begin{aligned} \text{b. } & 9 \text{ kg } 5 \text{ hg } 3 \text{ dag} - 8 \text{ kg } 5 \text{ hg } 3 \text{ dag} \\ & = 1 \text{ kg} \end{aligned}$$

kg	hg	dag
9	222	3
- 8	1000	3
1	222	0

$$\begin{aligned} \text{c. } & 8 \text{ dal } 55 \text{ dl} - 5 \text{ dal } 34 \text{ dl} \\ & = 3 \text{ dal } 21 \text{ dl} \end{aligned}$$

dal	dl
8	55
- 5	34
3	21

$$\begin{aligned} \text{b. } & 5 \text{ hm} - 5 \text{ dam } 3 \text{ m } 2 \text{ dm} \\ & = 4 \text{ hm } 4 \text{ dam } 6 \text{ m } 8 \text{ dm} \end{aligned}$$

hm	dam	m	dm
5	0	0	0
- 0	5	3	2
4	4	6	8

Exercise 10.3

1.	Weight of potatoes	=	5	500
	Weight of tomatoes	=	2	250
	Weight of onions	=	+ 1	000
	Total weight of the vegetables	=	8	750

So the total weight of the vegetables is 8 kg 750 g.

2.	Length of first cloth	=	2	15
	Length of second cloth	=	1	25
	Length of third cloth	=	+ 9	00
	Total lengths of cloth	=	12	40

So, Varun sold 12 m 40 cm cloth.

3.	Wheat was purchased from first place	=	55	15
	Wheat was purchased from second place	= +	20	25
	Total wheat was purchased	=	75	00
	Wheat was sold with him	= -	60	40
	Wheat was left by him	=	15	225

So, 15 kg 225 hg wheat was left with Ramu.

$$\begin{array}{rcl}
 4. \quad \text{Raman can drink water} & = & \begin{array}{r} l \\ 5 \\ \hline \end{array} \begin{array}{r} ml \\ 500 \\ \hline \end{array} \\
 \text{Vicky can drink water} & = & \begin{array}{r} - 4 \\ \hline \end{array} \begin{array}{r} 125 \\ \hline \end{array} \\
 \text{More water can drunk by Raman} & = & \boxed{\begin{array}{r} 1 \\ \hline \end{array}} \boxed{\begin{array}{r} 375 \\ \hline \end{array}}
 \end{array}$$

So, Raman can drink 1 / 375 ml water than Vickey.

$$\begin{array}{rcl}
 5. \quad \text{First bottle contains cold drink} & = & \begin{array}{r} l \\ 1 \\ \hline \end{array} \begin{array}{r} ml \\ 200 \\ \hline \end{array} \\
 \text{Second bottle more contains} & & \\
 \text{cold drink than first} & = & \begin{array}{r} - 1 \\ \hline \end{array} \begin{array}{r} 050 \\ \hline \end{array} \\
 \text{Second bottle contained} & = & \boxed{\begin{array}{r} 2 \\ \hline \end{array}} \boxed{\begin{array}{r} 250 \\ \hline \end{array}}
 \end{array}$$

∴ 2 / 50 ml cold drink is contained in the second bottle.

$$\begin{array}{rcl}
 6. \quad \text{Water was contained in bucket} & = & \begin{array}{r} l \\ 75 \\ \hline \end{array} \begin{array}{r} ml \\ 15 \\ \hline \end{array} \\
 \text{Water was pured into it} & = & \begin{array}{r} + 2 \\ \hline \end{array} \begin{array}{r} 30 \\ \hline \end{array} \\
 \text{Total water was contained in it} & = & \boxed{\begin{array}{r} 77 \\ \hline \end{array}} \boxed{\begin{array}{r} 45 \\ \hline \end{array}}
 \end{array}$$

So, the quantity of water in bucket was 77 / 45 ml now.

MCQs

Tick (✓) the correct option :

Ans. 1. i 2. i 3. i 4. ii 5. ii 6. iii.

11 Area

Exercise 11.1

1. Observe the following diagrams carefully and complete the following table :

Figure	A	B	C	D	E
Length	80	20	80	40	120
Breadth	50	15	30	40	80
Area = L × B	4000 cm ²	300 cm ²	2400 cm ²	2600 cm ²	9600 cm ²

2. Complete the following table :

	Figure	Breadth	Area
a.	12 m	4.5 m	54 m ²
b.	27 m	15 m	405 m ²
c.	36 m	2.50 m	90 m ²
d.	40 cm	17 m	680 cm ²
e.	12.5 m	6 cm	75 cm ²

3. Find the area of the following squares whose diagonals are given.

Area of a square = $\frac{1}{2} \times (\text{diagonal})^2$

a. Diagonal of the square = 8 cm

$\therefore \text{Area} = \frac{1}{2} \times 8^2 = \frac{8 \times 8}{2} = 32 \text{ cm}^2$

b. Diagonal of the square = 14 cm

$\therefore \text{Area} = \frac{1}{2} \times 14^2 = \frac{14 \times 14}{2} = 98 \text{ cm}^2$

c. Diagonal of the square = 12 cm

$\therefore \text{Area} = \frac{1}{2} \times 12^2 = \frac{12 \times 12}{2} = 72 \text{ cm}^2$

d. Diagonal of the square = 9.8 cm

$\therefore \text{Area} = \frac{1}{2} \times 9.8^2 = \frac{9.8 \times 9.8}{2} = 48.02 \text{ cm}^2$

Exercise 11.2

1. Assuming each square to be 1 cm^2 , find the approximate area of each figure :

a. 20 cm^2

b. 18 cm^2

c. 18 cm^2

d. 10 cm^2

2. Calculate the area of these composite shapes by dividing into rectangles and finding the sum of their areas :

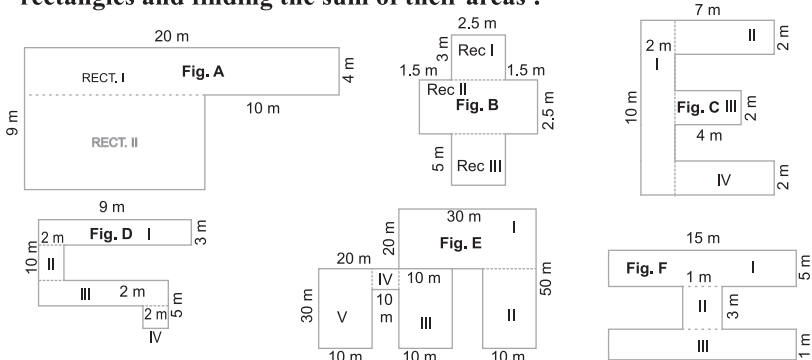


Fig. A = Rect. I + Rect. II = $(20 \times 4) + (5 \times 10) = (80 + 50) \text{ m}^2 = 130 \text{ m}^2$

Fig. B = Rect. I + Rect. II + Rect. III = $(3 \times 2.5) + (8.5 \times 2.5) + (5 \times 2.5) \text{ m}^2 = 41.25 \text{ m}^2$

Fig. C = Rect. I + Rect. II + Rect. III + Rect. IV = $(2 \times 10) + (5 \times 2) + (4 \times 2) + (5 \times 2) \text{ m}^2 = 48 \text{ m}^2$

Fig. D = Rect. I + Rect. II + Rect. III + Rect. IV = $(9 \times 3) + (5 \times 2) + (7 \times 2) + (3 \times 2) \text{ m}^2 = 57 \text{ m}^2$

Fig. E = Rect. I + Rect. II + Rect. III + Square IV + Rect V = $(30 \times 20) + (30 \times 10) + (10 \times 10) + (30 \times 10) \text{ m}^2 = 1600 \text{ m}^2$

Fig. F = Rect. I + Rect. II + Rect. III + $(15 \times 5) + (1 \times 3) + (15 \times 1) \text{ m}^2 = 75 + 3 + 15 = 93 \text{ m}^2$

3. Look at the figures given below. We see that the diagonal divides these squares or rectangles into two equal triangles. Find the area of each figure and then find the area of the right angled triangles by dividing by two :

Fig.	Length	Breadth	$A = L \times B$	Area of $\Delta = \frac{1}{2} \times$ Area of rect./sq.
A.	4 cm	4 cm	16 cm^2	$= \frac{1}{2} \times 16 = 8 \text{ cm}^2$
B.	6 cm	3 cm	18 cm^2	$= \frac{1}{2} \times 18 = 9 \text{ cm}^2$
C.	3 cm	4 cm	12 cm^2	$= \frac{1}{2} \times 12 = 6 \text{ cm}^2$
D.	2 cm	3 cm	6 cm^2	$= \frac{1}{2} \times 6 = 3 \text{ cm}^2$

4. Given below is a model of a school compound. Find the area covered by different parts in it. Express your answer in cm^2 .
- a. 30 cm^2 b. 20 cm^2 c. 65 cm^2 d. 8 cm^2
 e. 4 cm^2 f. 4 cm^2 g. 8 cm^2 d. 8 cm^2

MCQs

Tick (✓) the correct option :

Ans. 1. iii 2. iv 3. iv 4. ii 5. ii 6. ii.



12 Volume

Exercise 12.1

1. Find the volume of the following cuboids and cubes by counting the unit cubes of volume 1 cu cm :
- a. By counting off the unit cube, the volume of the cuboid of figure a is 24 cu cm.
 b. By counting of the unit cube, the volume of the cuboid of the figure b is 36 cu cm.
 c. By counting of the unit cube, the volume of the cuboid of figure c is 24 cu cm.
 d. By counting of the unit cube, the volume of the cuboid of the figure d is 24 cu cm.
2. Find the volume of the cube whose each edge is :
- Volume of the cube = $(\text{edge})^3$
- a. Edge of the cube = 3 cm
 \therefore Volume of the cube = $(3)^3 = 3 \times 3 \times 3 = 27 \text{ cm}^3$
- c. Edge of the cube = 4 cm
 \therefore Volume of the cube = $(4)^3 = 4 \times 4 \times 4 = 64 \text{ cm}^3$
- d. Edge of the cube = 7 cm
 \therefore Volume of the cube = $(7)^3 = 7 \times 7 \times 7 = 343 \text{ cm}^3$

3. Find the volume of the cuboid whose dimensions are :

Volume of the cuboid = length \times breadth \times height

a. Length = 5 cm, breadth = 4 cm and height 3 cm.

$$\therefore \text{Volume of the cuboid} = 5 \times 4 \times 3 = 60 \text{ cm}^3.$$

b. Length = 7 cm, breadth = 6 cm and height = 4 cm.

$$\therefore \text{Volume of the cuboid} = 7 \times 6 \times 4 = 168 \text{ cm}^3$$

4. Find the volume of these solids :

Volume = length \times breadth \times height

a. Length 10 cm, breadth = 3.5 cm and height = 3 cm

$$\therefore \text{Volume of the solid} = 10 \times 3.5 \times 3 =$$

b. Length = 6 cm, breadth = 3 cm and height = 2 cm

$$\therefore \text{Volume of the solid} = 6 \times 3 \times 2 = 36 \text{ cm}^3$$

c. Length = 5 cm, breadth = 2 cm and height = 4 cm

$$\therefore \text{Volume of the solid} = 5 \times 2 \times 4 = 40 \text{ cm}^3$$

5. Complete the table :

	$L = \frac{V}{B \times H}$	$B = \frac{V}{L \times H}$	$H = \frac{V}{B \times L}$	$V = L \times B \times H$
a.	16 cm	3.5 cm	2 cm	112 cm ³
b.	12 cm	11 cm	7 cm	924 cm ³
c.	15 cm	14 cm	4 cm	840 cm ³
d.	12 cm	11 cm	6 cm	792 cm ³
e.	12 cm	3 cm	8 cm	288 cm ³
f.	9 cm	10 cm	4 cm	360 cm ³
g.	10.5 cm	3.2 cm	5 cm	168 cm³
h.	20 cm	5.5 cm	4 cm	440 cm³
i.	14 cm	4 cm	2.5 cm	140 cm³
j.	98.4 cm	6 cm	2cm	112.8 cm³
k.	8 cm	7.2 cm	4 cm	230.4 cm³
l.	11.5 cm	9 cm	5 cm	517.5 cm³

Exercise 12.2

1. Each side of the cube = 15 cm 4 mm = 15.4 cm

$$\therefore \text{Volume of the cube} = (\text{side})^3 = (15.4)^3 = 15.4 \times 15.4 = \mathbf{3652.2464 \text{ cm}^3}$$

2. Edge of a smaller cube = 2.5 cm

$$\therefore \text{Volume of a smaller cube} = (2.5)^3 = 2.5 \times 2.5 \times 2.5 = 15.625 \text{ cm}^3$$

$$\therefore \text{Volume of 25 smaller cube} = 25 \times 15.625 = 390.625 \text{ cm}^3$$

$$\therefore \text{Volume of the cubical block of gold} = 390.625 \text{ cm}^3.$$

3. Edge of a smaller cube = 25 cm

$$\therefore \text{Volume of a box} = (25)^3 = 25 \times 25 \times 25 = 15625 \text{ cm}^3$$

Each side of the cubical room = 2.50 m = 250 cm

$$\therefore \text{Volume of the room} = (250)^3 = 250 \times 250 \times 250 = 15625000 \text{ cm}^3$$

$$\begin{aligned} \text{Number of boxes can be placed in the room} &= \frac{\text{Volume of the room}}{\text{Volume of 1 box}} \\ &= \frac{15625000}{15625} = 1000 \text{ boxes.} \end{aligned}$$

So, **1000 boxes** can be placed in the room.

4. Sides of the big cube = 5 m = 500 cm

$$\therefore \text{Volume of the big cube} = (500)^3 = 500 \times 500 \times 500 = 125000000$$

Dimensions (sides) of short cube = 5 cm

$$\therefore \text{Volume of the short cube} = 5 \times 5 \times 5 = 125 \text{ cm}^3$$

$$\begin{aligned} \therefore \text{No of small cubes which can be formed from big cube} &= \frac{125000000}{125} \\ &= 10,00,000 \text{ cubes} \end{aligned}$$

So, **10,00,000 cubes** can be formed.

5. Dimension (each side) of cubical pond = $\frac{35}{8}$ m

$$\begin{aligned} \text{Volume of the cubical pond} &= (\text{side})^3 = \left(\frac{35}{8}\right)^3 = \frac{35}{8} \times \frac{35}{8} \times \frac{35}{8} = \frac{42875}{512} \\ &= 83.740 \text{ m}^3 \end{aligned}$$

So 83.740 m³ mud was obtained from the pond.

6. Length of cubical pit = 50m, breadth = 35 m and depth = $\frac{24}{4}$ m

$$\therefore \text{Volume of the pit} = 50 \times 35 \times \frac{23}{4} = 1006.25 \text{ m}^2$$

Volume of mud scooped out from the pit is **1006.25 m²**

7. Length of water tank = 15 m, breadth = 12.25 m and height = 10 m

$$\therefore \text{Volume of the water tank} = 15 \times 12.25 \times 10 = 1837.5 \text{ m}^3$$

$$\therefore \text{Volume of water required to fulfill the tank } 1837.5 \text{ m}^3 = 1837.5 \times 1000 \text{ litres} = 1837500 \text{ litres}$$

So, 1837500 litres water required to fulfil the tank.

8. Volume of a small cube = 1 cm³

$$\therefore \text{Volume of 100 small cube} = 1 \times 100 = 100 \text{ cm}^3$$

$$\therefore \text{Volume of the cuboid that was formed by 100 cubes is } 100 \text{ cm}^3.$$

9. Length of a hall = 25 m, its breadth = 19 m and its height = 8 m

$$\text{Volume of the hall} = 25 \times 19 \times 8 = 3800 \text{ m}^3$$

So, there is 3800 m³ air in the hall.

10. Length of the wall = 35m, its breadth = 2m and its height = 25 m

$$\therefore \text{Volume of the wall} = 35 \times 2 \times 25 = 1750 \text{ m}^3 = 1750,000,000 \text{ cm}^3$$

size of a brick = 25 × 20 × 7 = 3500 cm³

$$\therefore \text{Volume of 1 brick} = 25 \times 20 \times 7 = 3500 \text{ cm}^3$$

$$\begin{aligned} \text{Number of bricks} &= \frac{\text{Volume of the wall}}{\text{Volume of 1 brick}} = \frac{1750,000,000}{3500} \\ &= 500,000 \end{aligned}$$

So, 500,000 bricks and to make the wall.

MCQs

Tick (✓) the correct option :

Ans. 1. ii 2. ii 3. ii 4. i 5. iv 6. i.



13 Simple Interest

Exercise 13.1

1. Find the simple interest when :

a. Principal = ₹1,000, Rate = 2% per annum, Time = 3 years

$$\therefore \text{Simple interest} = \frac{1000 \times 2 \times 3}{100} = \text{₹60}$$

b. Principal = ₹1250 Rate = 18% per annum, Time = 6 months = $\frac{1}{2}$ year

$$\therefore \text{simple interest} = \frac{1250 \times 18 \times \frac{1}{2}}{100 \times 2} = \text{₹270}$$

c. Principal = ₹3000 Rate $4\frac{1}{2}\% = \frac{9}{2}\%$, Time = 6 months = $\frac{1}{2}$ year

$$\therefore \text{Simple interest} = \frac{3000 \times \frac{9}{2} \times \frac{1}{2}}{100 \times 2} = \text{₹270}$$

d. Principal = ₹2,000 Rate = $1\frac{1}{2}\% = \frac{3}{2}\%$, Time = 6 months = $\frac{1}{2}$ year

$$\therefore \text{Simple interest} = \frac{2000 \times \frac{3}{2} \times \frac{1}{2}}{100 \times 2 \times 2} = \text{₹15}$$

e. Principal = ₹2500 Rate = 2% per annum, Time = 3 months = $\frac{1}{4}$ year

$$\therefore \text{Simple interest} = \frac{2500 \times 2 \times \frac{1}{4}}{100 \times 4 \times 2} = \text{₹} \frac{25}{2} = \text{₹12.50}$$

2. Amount = Principal + interest

a. Principal = ₹1200, Interest = ₹340

$$\therefore \text{Amount} = \text{₹1200} + \text{₹340} = \text{₹}(1200 + 340) \text{ ₹1540}$$

b. Principal = ₹800, Interest = ₹120

$$\therefore \text{Amount} = \text{₹800} + \text{₹120} = \text{₹920}$$

c. Interest = Amount – principal

Amount = ₹880, Principal = ₹800

$$\therefore \text{Interest} = \text{₹880} - \text{₹800} = \text{₹80}$$

d. Amount = ₹1200, Interest = ₹220

Principal = Amount – interest

$$= \text{₹1200} - \text{₹220} = \text{₹980}$$

3. Principal = 900, Rate = 5% per annum, Time = 2 years

$$\therefore \text{Interest} = \frac{900 \times 5 \times 2}{100} = \text{₹90}$$

$$\therefore \text{Amount} = 900 + \text{₹90} = \text{₹990}$$

So, Arvind paid 990 to his friend.

4. Principal = ₹360, Rate = 4% per annum, Time = $2\frac{1}{2} = \frac{5}{2}$ years
 \therefore Simple interest = $\frac{P \times R \times T}{100} = ₹90$
 \therefore Amount = ₹900 + ₹90 = ₹990
 So, Arvind paid ₹990 to his friend.
5. Principal = 10,000, Rate = $6\frac{1}{2}\% = \frac{13}{2}\%$ per annum Time = $3\frac{1}{2}\% = \frac{7}{2}$ years
 \therefore Simple interest = $\frac{P \times R \times T}{100} = \frac{10000 \times 13 \times 7}{100 \times 2 \times 2} = ₹2275$
 \therefore Amount = P+S.I. = ₹10,000 + ₹2,275 = ₹12,275
 \therefore Shikha will get back ₹12,275 from company.
6. Principal = ₹2000, Rate = 6 per annum, Time = 5 years
 Simple interest = $\frac{P \times R \times T}{100} = \frac{2000 \times 6 \times 5}{100} = ₹600$
 Amount = P + SI = ₹2000 + ₹600 = ₹2600
 So, Pinky will get back ₹2600 from the bank.
7. Principal = ₹10,000, Rate = 10% per annum Time = 7 years and 4 months
 $= \frac{23}{6}$ years
 \therefore Simple interest = $\frac{10,000 \times 10 \times 22}{100 \times 3} = ₹ \frac{20,000}{3} = ₹ 7339.33$
 Amount = P + SI = ₹10,000 + ₹7339.33 = ₹17339.33
 So, Chintu will get back ₹17339.33 from the company.
8. Principal = ₹15,000, Rate = 6% per annum, Time = 3 years and 10 months
 $= 3\frac{5}{6}$ years = $\frac{23}{6}$ years
 \therefore Simple interest = $\frac{15000 \times 6 \times 23}{100 \times 6} = ₹3450$
 Amount = ₹15000 + ₹3,450 = ₹18,450.
 So, Mona will get back ₹18,450 from the company.

MCQs

Tick (✓) the correct option :

Ans. 1. ii 2. iii 3. iv 4. ii 5. ii 6. ii.



14 Patterns

Exercise 14.1

1. Observe the pattern and write the next term of the following :
- a. 4, 16, 64, 256, **1024** b. 243, 81, 27, 9, **3**
 c. $6^2 - 5^2 + 4^2 - 3^2 + 2^2$ d. $3 \times 5^2, 4 \times 6^2, 5 \times 7^2, 6 \times 8^2, 7 \times 9^2$
 e. 20, 17, 13, 8, **2** f. $5 + 9 + 7 + 7 + 9^3 + 5$

2. Find the next term in the following :

a. $2 + 6 + 10 + 14 + 18$

b. $7^2 + 6^2 + 5^2 + 4^2 + 3^2$

c. $4 + 16 + 36 + 64 + 100$

d. 1, 4, 27, 16, 125

e. $10 \times 2, 8 \times 4, 6 \times 6, 4 \times 8, 2^3 \times 10^2$

f. 7, 3, -1, -5, -9

3. Identify the pattern in the following and fill in the blanks :

$$9 \times 9 + 7 = 88$$

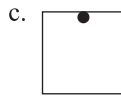
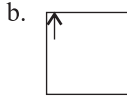
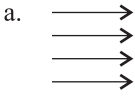
$$98 \times 9 + 6 = 888$$

$$987 \times 9 + 5 = 8888$$

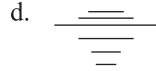
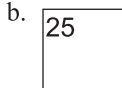
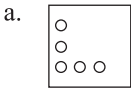
$$9876 \times 9 + 4 = 88888$$

Exercise 14.2

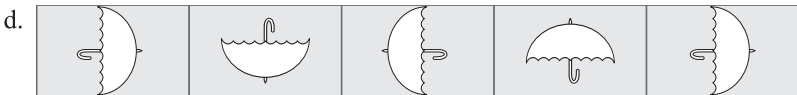
1. Draw the next figure in the following :



2. Observe the pattern and draw a next shape in the following :



2. What should come next?



MCQs

Tick (✓) the correct option :

Ans. 1. ii 2. iv 3. iii 4. ii 5. ii.