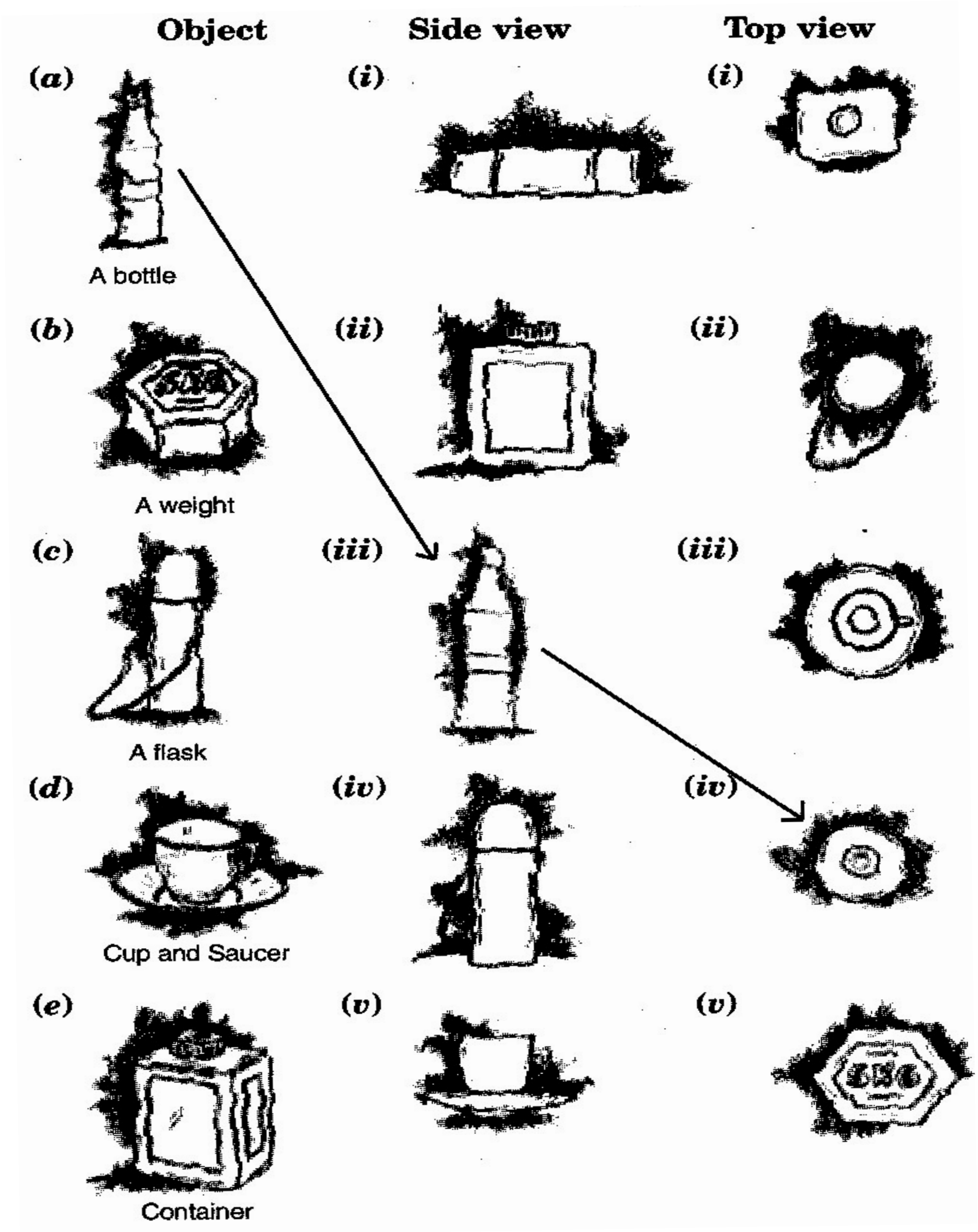
Exercise 10.1

Question 1:

For each of the given solid, the two views are given. Match for each solid the corresponding top and front views. The first one is done for you.



Answer 1:

(a) ⟶ (iii) ⟶ (iv)

(b) ⟶ (i) ⟶ (v)

(c) ⟶ (iv) ⟶ (ii)

(d) ⟶ (v) ⟶ (iii)

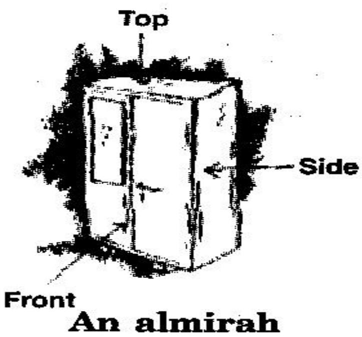
(e) ⟶ (ii) ⟶ (i)

Question 2:

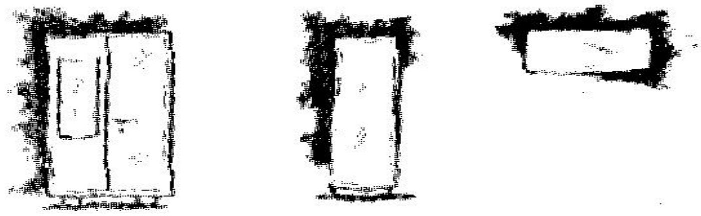
For each of the given solid, the three views are given. Identify for each solid the corresponding top, front and side views.

Object

(a)

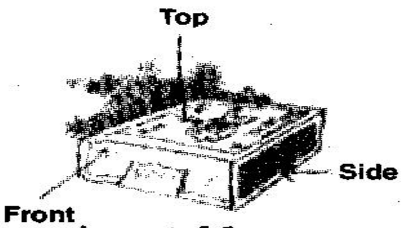


An almirah



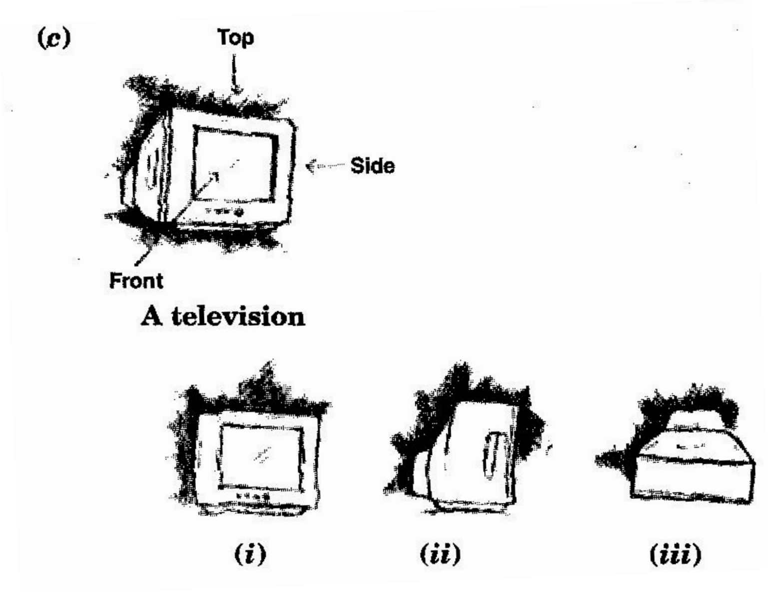
(i) **(ii)** **(iii)**

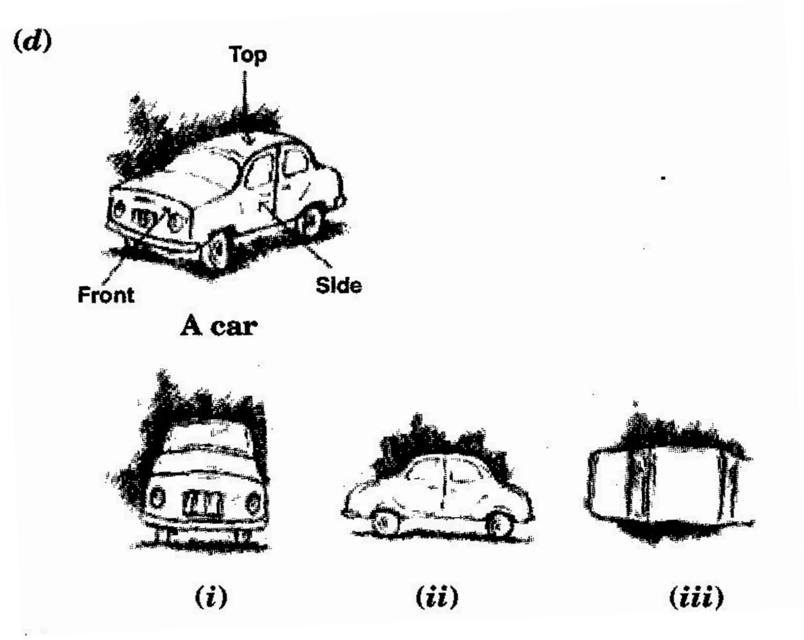
(b)



A matchbox

(i) **(ii)** **(iii)**





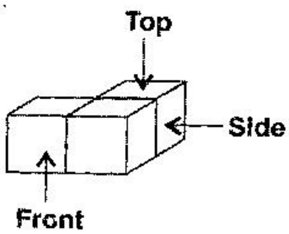
Answer 2:

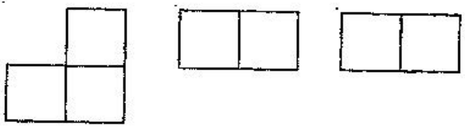
(a) $\longrightarrow$ (i) $\longrightarrow$ Front (ii) $\longrightarrow$ Side (iii) $\longrightarrow$ Top view
(b) $\longrightarrow$ (i) $\longrightarrow$ Side (ii) $\longrightarrow$ Front (iii) $\longrightarrow$ Top view
(c) $\longrightarrow$ (i) $\longrightarrow$ Front (ii) $\longrightarrow$ Side (iii) $\longrightarrow$ Top view
(d) $\longrightarrow$ (i) $\longrightarrow$ Front (ii) $\longrightarrow$ Side (iii) $\longrightarrow$ Top view

Question 3:

For each given solid, identify the top view, front view and side view.

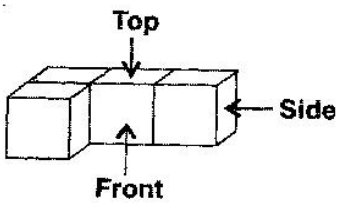
(a)

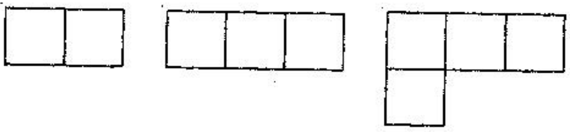




(i) (ii) (iii)

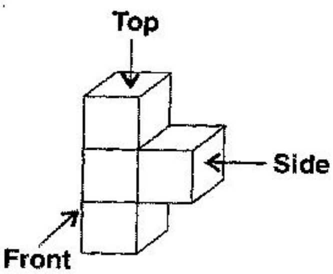
(b)

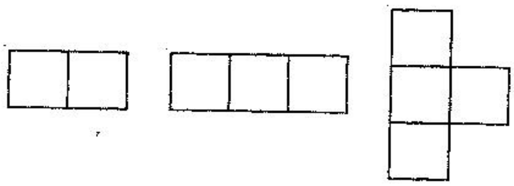




(i) (ii) (iii)

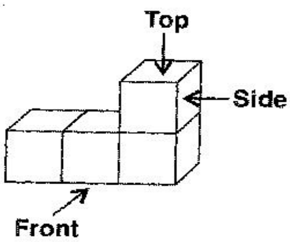
(c)

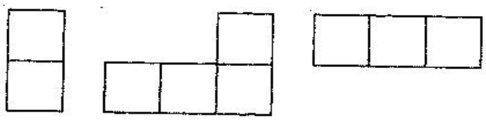




(i) (ii) (iii)

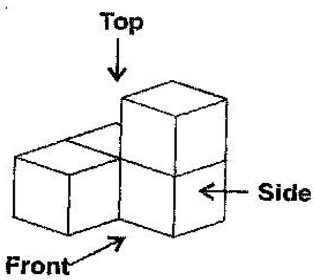
(d)

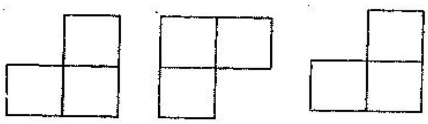




(i) (ii) (iii)

(e)





(i) (ii) (iii)

Answer 3:

(a) $\longrightarrow$ (i) $\longrightarrow$ Top view (ii) $\longrightarrow$ Front view (iii) $\longrightarrow$ Side view

(b) $\longrightarrow$ (i) $\longrightarrow$ Side view (ii) $\longrightarrow$ Front view (iii) $\longrightarrow$ Top view

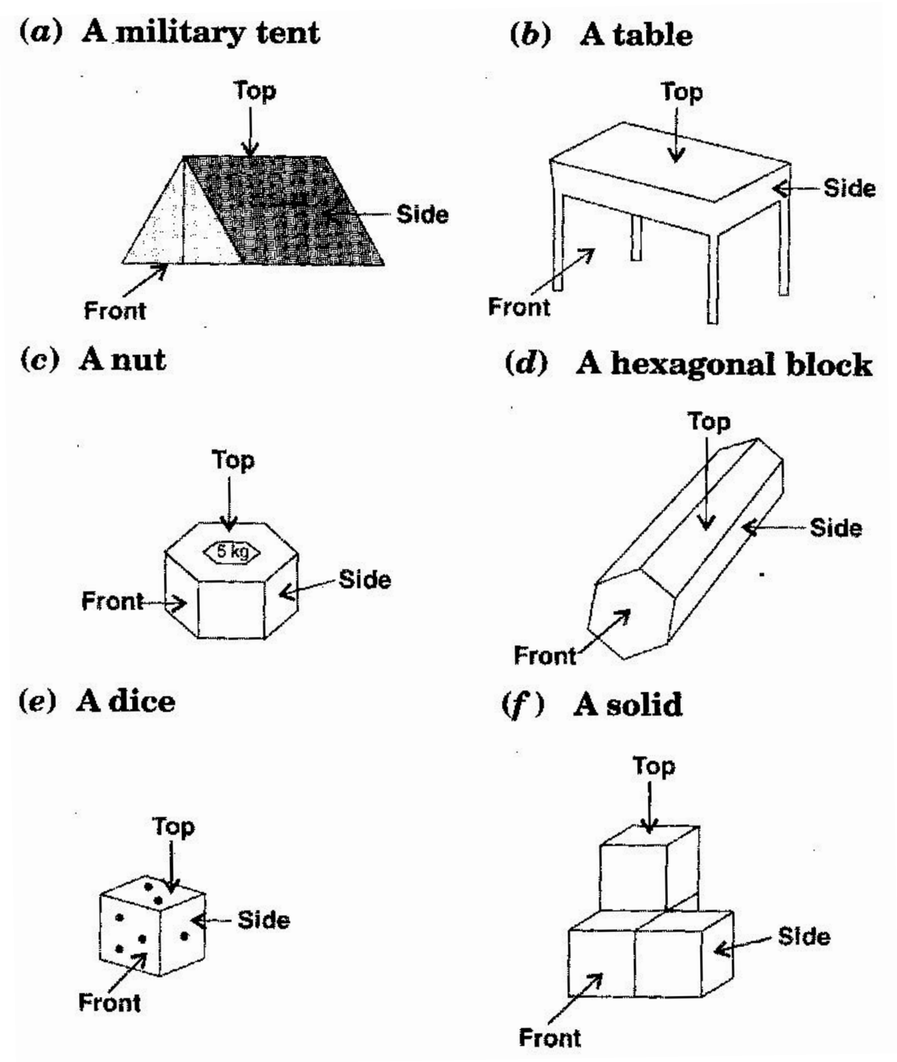
(c) $\longrightarrow$ (i) $\longrightarrow$ Top view (ii) $\longrightarrow$ Side view (iii) $\longrightarrow$ Front view

(d) $\longrightarrow$ (i) $\longrightarrow$ Side view (ii) $\longrightarrow$ Front view (iii) $\longrightarrow$ Top view

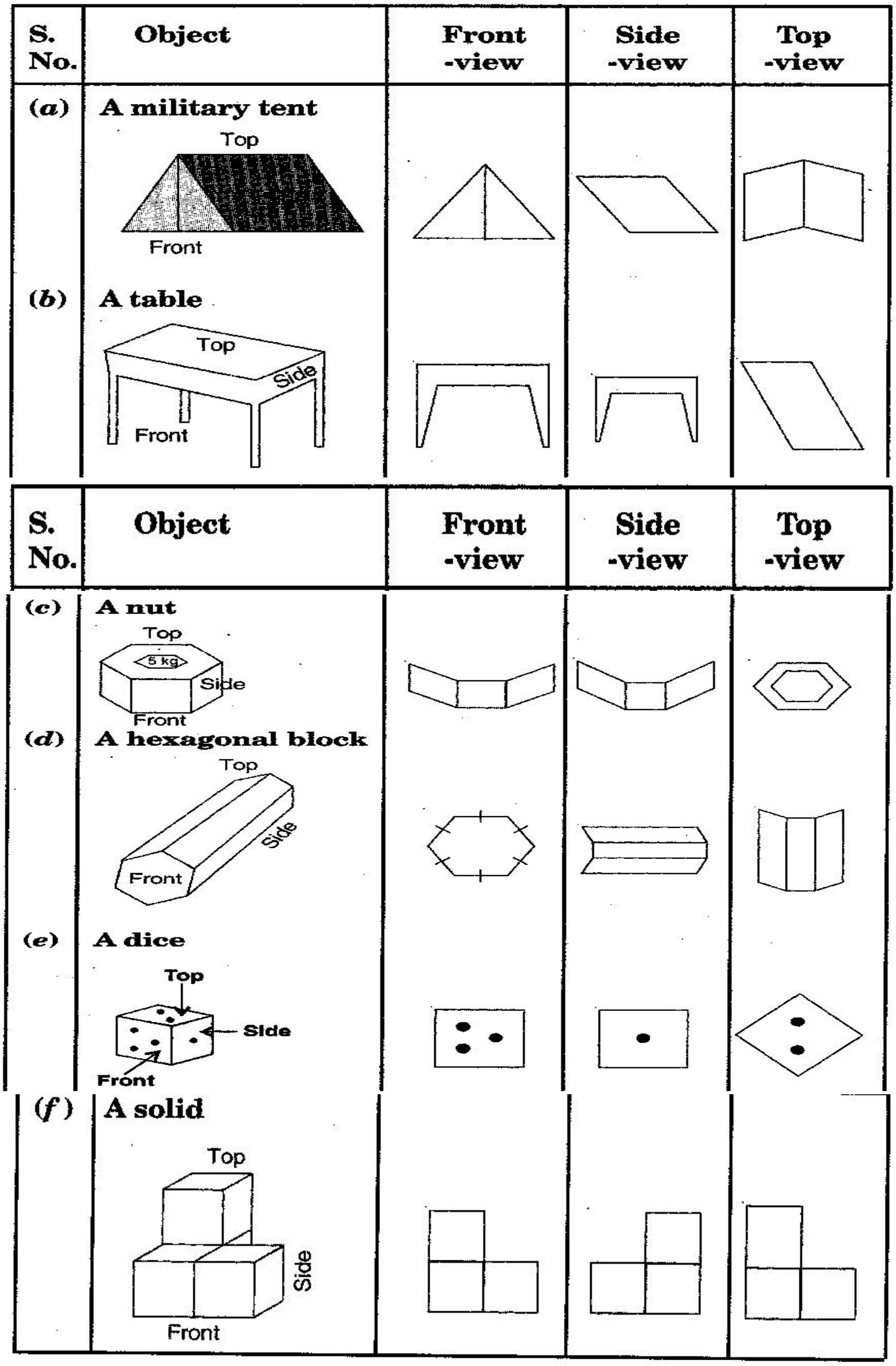
(e) $\longrightarrow$ (i) $\longrightarrow$ Front view (ii) $\longrightarrow$ Top view (iii) $\longrightarrow$ Side view

Question 4:

Draw the front view, side view and top view of the given objects:



Answer 4:

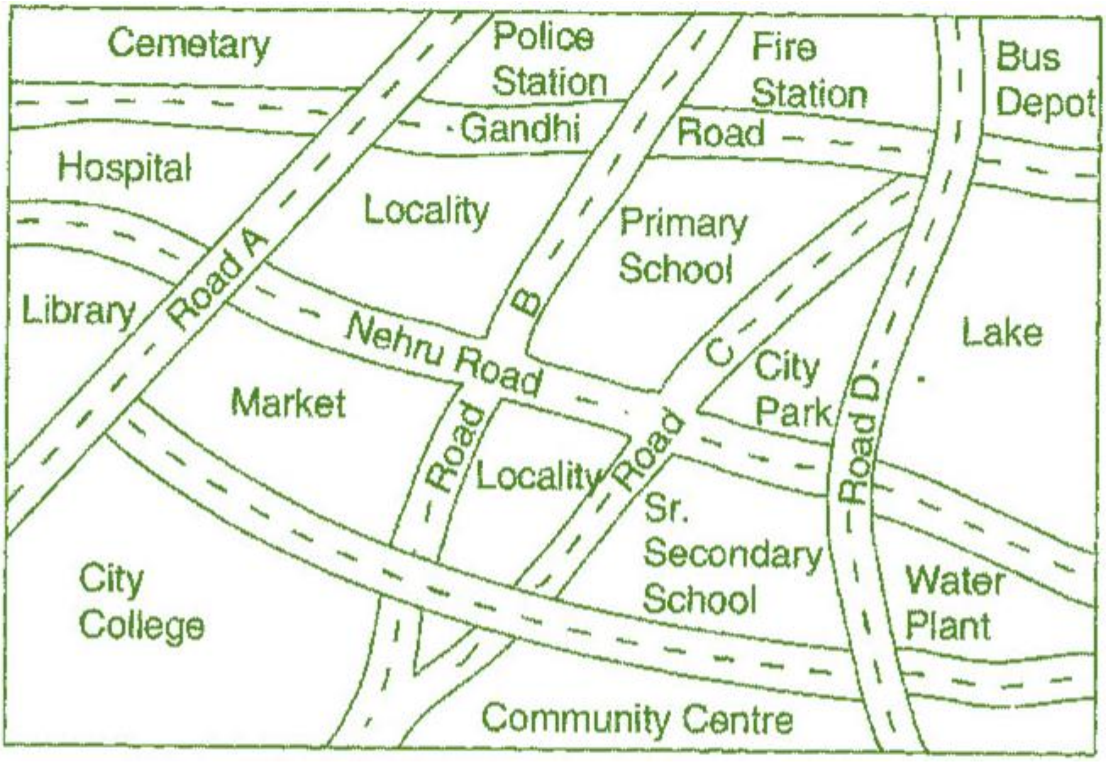


S. No.	Object	Front -view	Side -view	Top -view
(a)	A military tent (Top, Front)			
(b)	A table (Top, Side, Front)			
(c)	A nut (Top, 5 kg, Side, Front)			
(d)	A hexagonal block (Top, Side, Front)			
(e)	A dice (Top, Side, Front)			
(f)	A solid (Top, Side, Front)			

Exercise 10.2

Question 1:

Look at the given map of a city.



Answer the following:

(a) Colour the map as follows: Blue – water, Red – fire station, Orange – library, Yellow – schools, Green – park, Pink – college, Purple – hospital, Brown – Cementary.

(b) Mark the green 'X' at the intersection of Road 'C' and Nehru Road, Green 'Y' at the intersection of Gandhi Road and Road 'A'.

(c) In red, draw a short street route from Library to the bus depot.

(d) Which is further east, the city park or the market?

(e) Which is further south, the Primary School or the Sr. Secondary School?

Answer 1:

This is a creativity, so do yourself.

Question 2:

Draw a map of your class room using proper scale and symbols for different objects.

Answer 2:

Do yourself.

Question 3:

Draw a map of your school compound using proper scale and symbols for various features like playground, main building, garden etc.

Answer 3:

Do yourself.

Question 4:

Draw a map giving instructions to your friend so that she reaches your house without any difficulty.

Answer 4:

Do yourself.

Exercise 10.3

Question 1:

Can a polygon have for its faces:

(i) 3 triangles (ii) 4 triangles (iii) a square and four triangles

Answer 1:

(i) No, a polyhedron cannot have 3 triangles for its faces.

(ii) Yes, a polyhedron can have four triangles which is known as pyramid on triangular base.

(iii) Yes, a polyhedron has its faces a square and four triangles which makes a pyramid on square base.

Question 2:

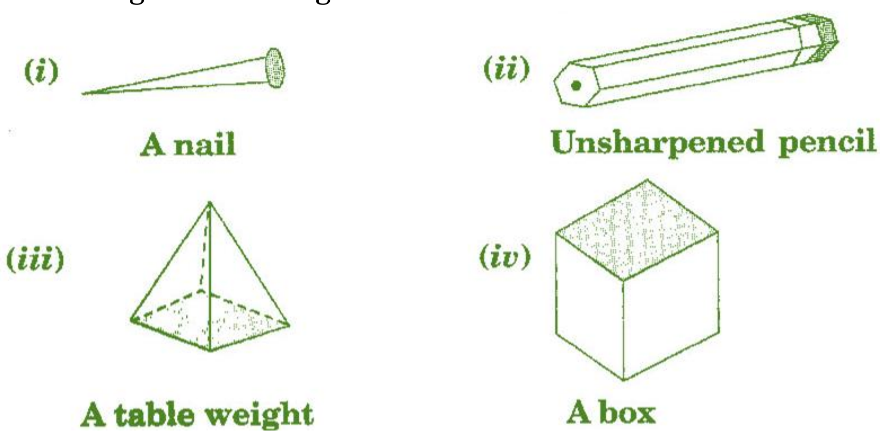
Is it possible to have a polyhedron with any given number of faces? (Hint: Think of a pyramid)

Answer 2:

It is possible, only if the number of faces are greater than or equal to 4.

Question 3:

Which are prisms among the following:



Answer 3:

Figure (ii) unsharpened pencil and figure (iv) a box are prisms.

Question 4:

(i) How are prisms and cylinders alike?

(ii) How are pyramids and cones alike?

Answer 4:

(i) A prism becomes a cylinder as the number of sides of its base becomes larger and larger.

(ii) A pyramid becomes a cone as the number of sides of its base becomes larger and larger.

Question 5:

Is a square prism same as a cube? Explain.

Answer 5:

No, it can be a cuboid also.

Question 6:

Verify Euler's formula for these solids.

Answer 6:

(i) Here, figure (i) contains 7 faces, 10 vertices and 15 edges.
Using Euler's formula, we see F + V – E = 2
Putting F = 7, V = 10 and E = 15,
F + V – E = 2
$\Rightarrow$ 7 + 10 – 5 = 2
$\Rightarrow$ 17 – 15 = 2
$\Rightarrow$ 2 = 2
$\Rightarrow$ L.H.S. = R.H.S.

(ii) Here, figure (ii) contains 9 faces, 9 vertices and 16 edges.
Using Euler's formula, we see F + V – E = 2

$F + V - E = 2$

$\Rightarrow \quad 9 + 9 - 16 = 2$

$\Rightarrow \quad 18 - 16 = 2$

$\Rightarrow \quad 2 = 2$

$\Rightarrow \quad$ L.H.S. = R.H.S.

Question 7:

Using Euler's formula, find the unknown:

Faces	**?**	**5**	**20**
Vertices	6	?	12
Edges	12	9	?

Answer 7:

In first column, $F = ?, V = 6$ and $E = 12$

Using Euler's formula, we see $F + V - E = 2$

$F + V - E = 2$

$\Rightarrow \quad F + 6 - 12 = 2$

$\Rightarrow \quad F - 6 = 2$

$\Rightarrow \quad F = 2 + 6 = 8$

Hence there are 8 faces.

In second column, $F = 5, V = ?$ and $E = 9$

Using Euler's formula, we see $F + V - E = 2$

$F + V - E = 2$

$\Rightarrow \quad 5 + V - 9 = 2$

$\Rightarrow \quad V - 4 = 2$

$\Rightarrow \quad V = 2 + 4 = 6$

Hence there are 6 vertices.

In third column, $F = 20, V = 12$ and $E = ?$

Using Euler's formula, we see $F + V - E = 2$

$F + V - E = 2$

$\Rightarrow \quad 20 + 12 - E = 2$

$\Rightarrow \quad 32 - E = 2$

$\Rightarrow \quad E = 32 - 2 = 30$

Hence there are 30 edges.

Question 8:

Can a polyhedron have 10 faces, 20 edges and 15 vertices?

Answer 8:

If F = 10, V = 15 and E = 20.

Then, we know Using Euler's formula, F + V – E = 2

$$\begin{aligned} \text{L.H.S.} &= F + V - E \\ &= 10 + 15 - 20 \\ &= 25 - 20 \\ &= 5 \\ \text{R.H.S.} &= 2 \end{aligned}$$

$\because$ L.H.S. $\neq$ R.H.S.

Therefore, it does not follow Euler's formula.