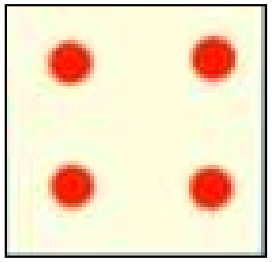
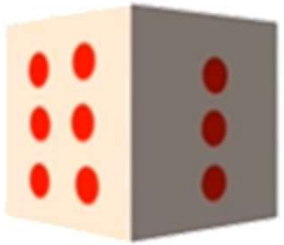
VISUALISING SOLID SHAPES



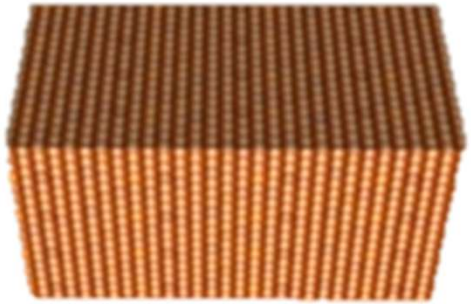
Front



Side

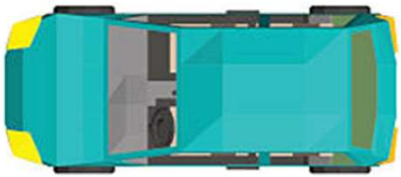
Top

Front



Top

Side



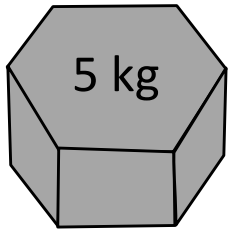
TOP

BACK

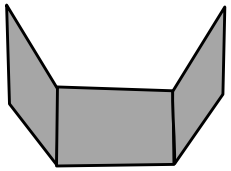
Front

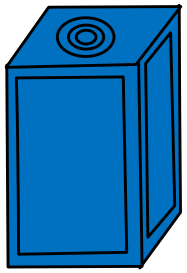
Side

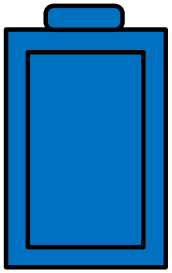
	Object		Side view		Top view
(a)		(i)		(i)	
(b)		(ii)		(ii)	
(c)		(iii)		(iii)	
(d)		(iv)		(iv)	
(e)		(v)		(v)	

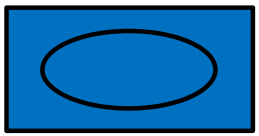

5 kg

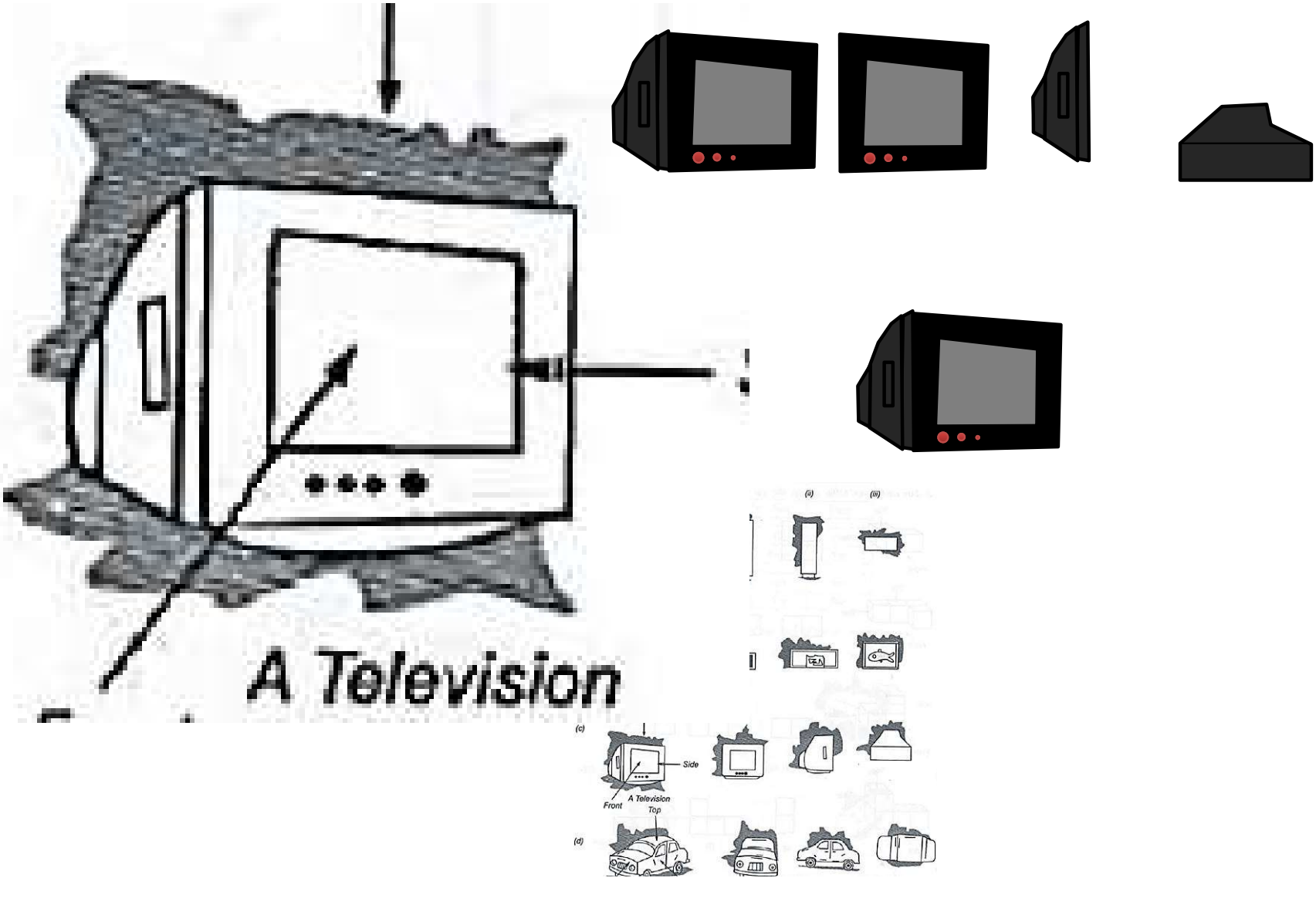

5 kg



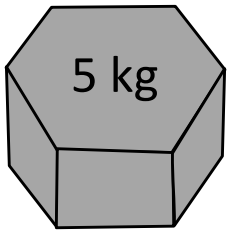


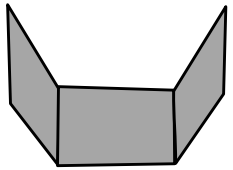





A Television
(ii)
(iii)
(c)
Side
Front
A Television
Top
(d)

Object	Side view	Top View
(a) 	(i) 	(ii) 
(b) 	(ii) 	(iii) 
(c) 	(iii) 	(iiii) 
(d) 	(iv) 	(iv) 
(e) 	(v) 	(v) 





Q. Square and a Rectangular field with measurements as given in the figure have the same perimeter. **Which field has a larger area?**


60 m


80 m

Sol.

Perimeter of Square = **Perimeter of Rectangle**

$4 \times \text{side} = 2\,(l + b)$

Hint :
To find : Breadth

$\therefore \quad 4 \times 60 = 2\,(80 + b)$

120

$\therefore \quad \frac{240}{2} = 80 + b$

$\therefore \quad 120 = 80 + b$

$\therefore \quad b = 120 - 80$

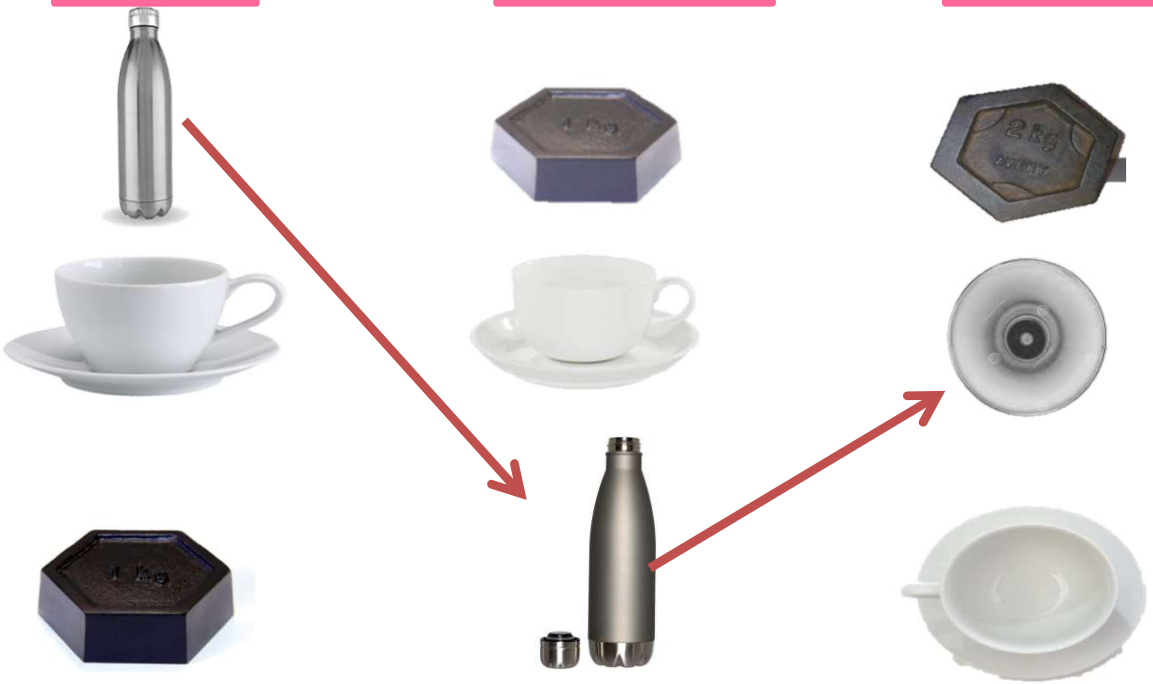
$b = 40$ m

We know,
Perimeter of Square = 4 × side
Perimeter of Rectangle = 2(l + b)

Q.1 For each of the given solid, the two views are given.
Match for each solid the corresponding top and front views

A bottle

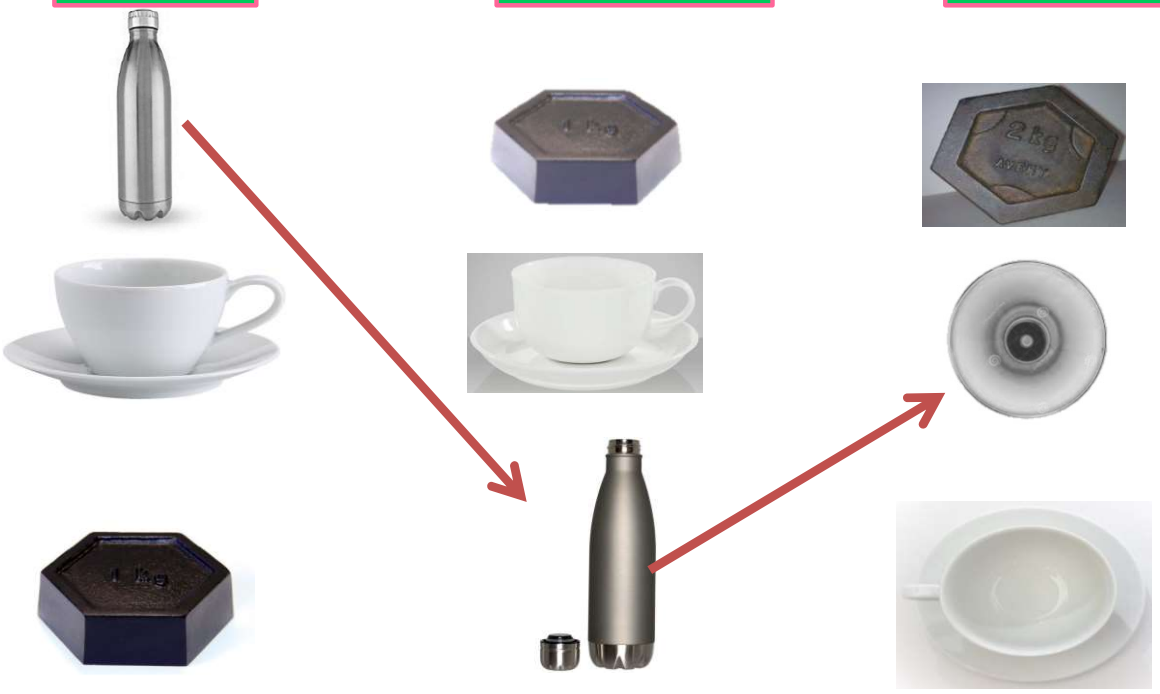
Object	Side view	Top view



Q.1 **For each of the given solid, the two views are given.**
Match for each solid the corresponding top and front views

A bottle

Object	Side view	Top view



Q.1 For each of the given solid, the two views are given.
Match for each solid the corresponding top and front views

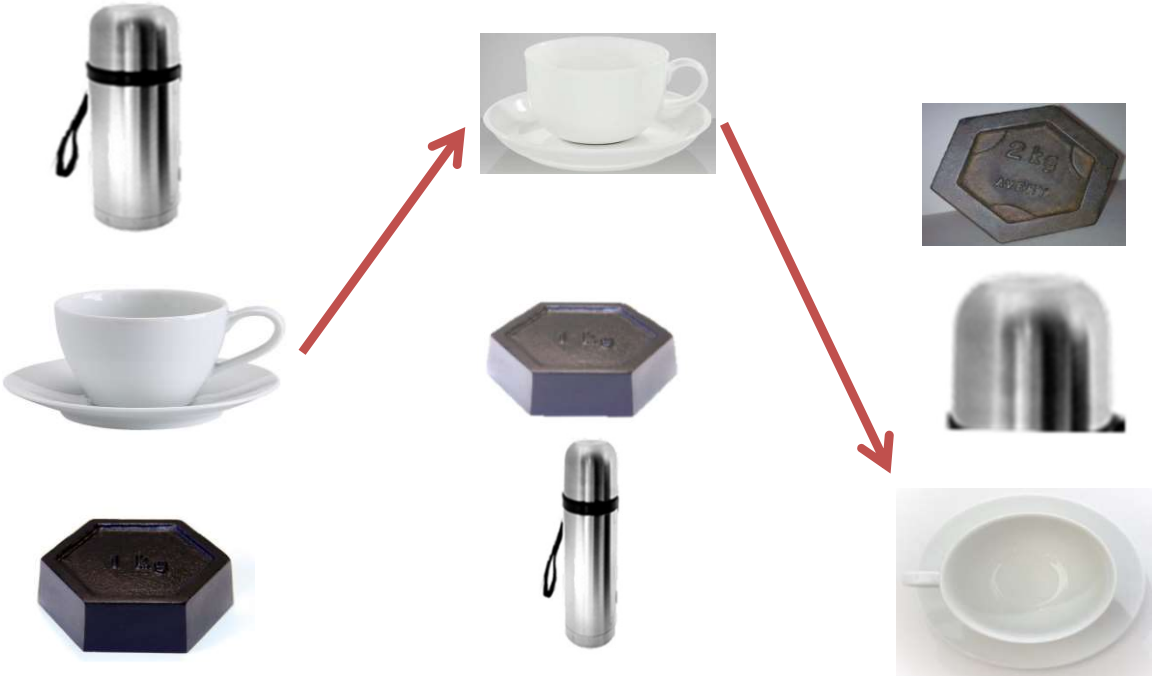
A Weight

Object **Side view** **Top view**

Q.1 **For each of the given solid, the two views are given.**
Match for each solid the corresponding top and front views

A Cup & saucer

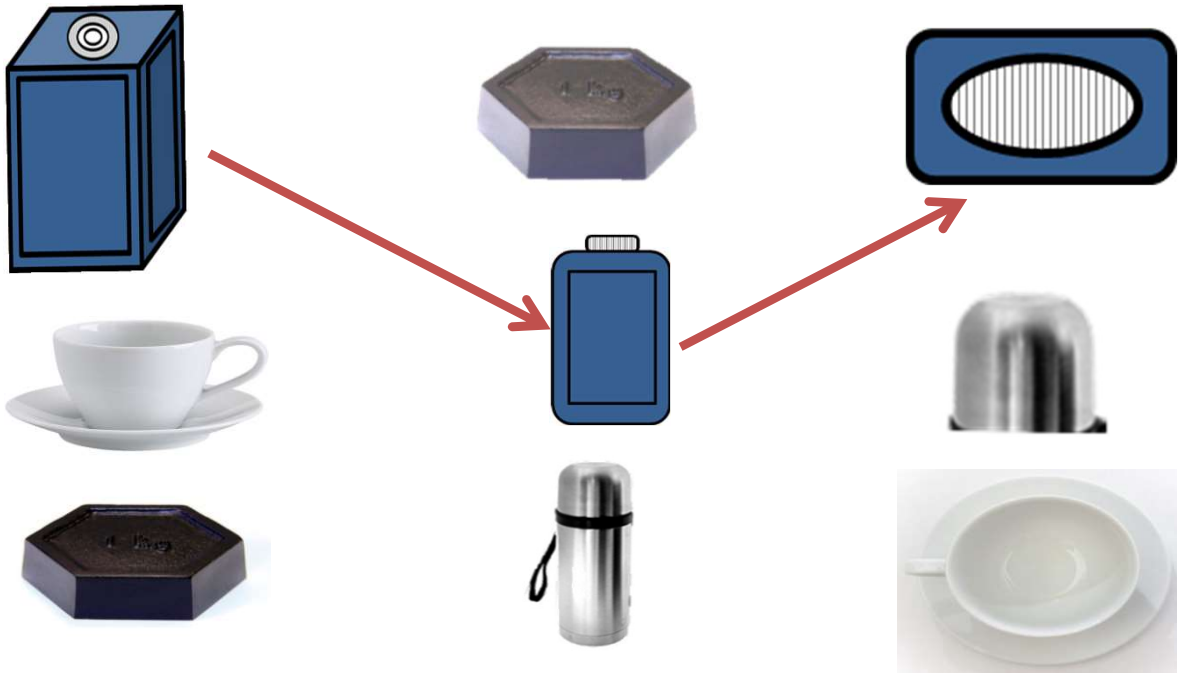
Object **Side view** **Top view**



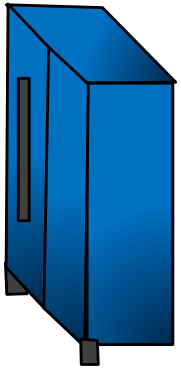
Q.1 **For each of the given solid, the two views are given.**
Match for each solid the corresponding top and front views

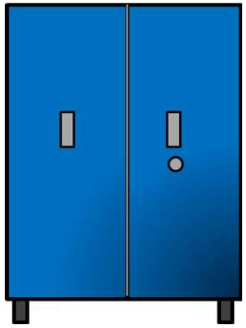
A Container

Object **Side view** **Top view**



Q.1 For each of the given solid, the three views are given. Identify for each solid the corresponding top, front and side views





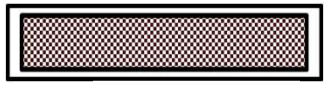
Front

Side

Top

Top

Front



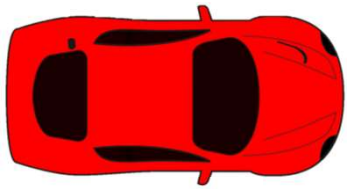
Side

Identify for each solid the corresponding top, front and side views

Top

Front

Side



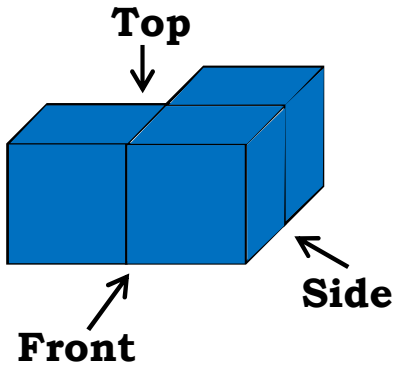
Top

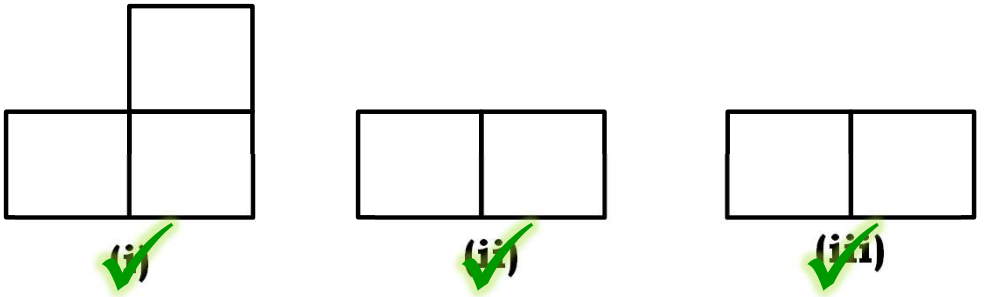
Front

Side

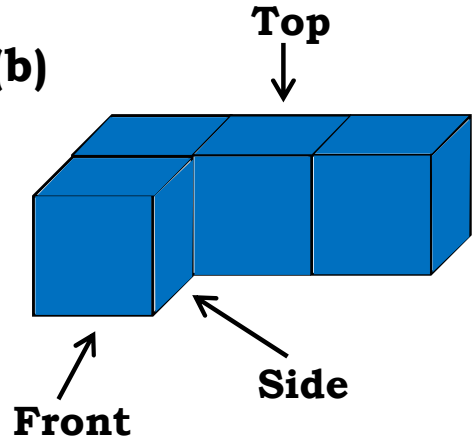
Q For each given solid, identify the **top view**, **side view** & **front view.**

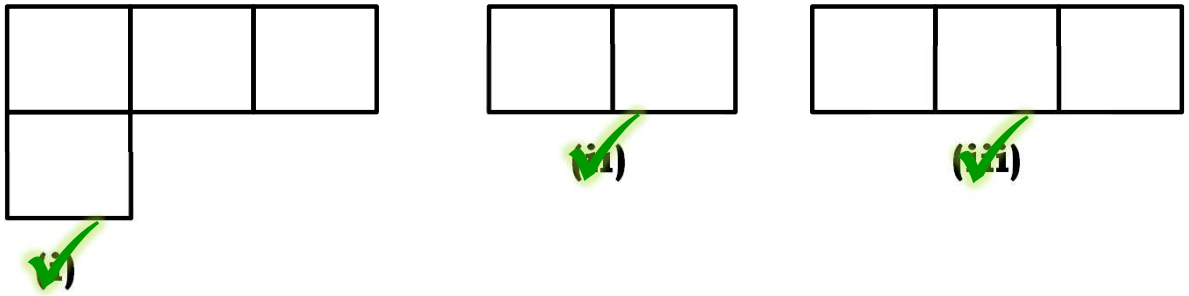
(a)





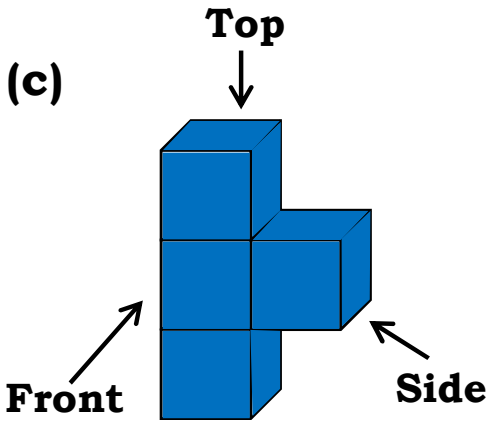
(b)

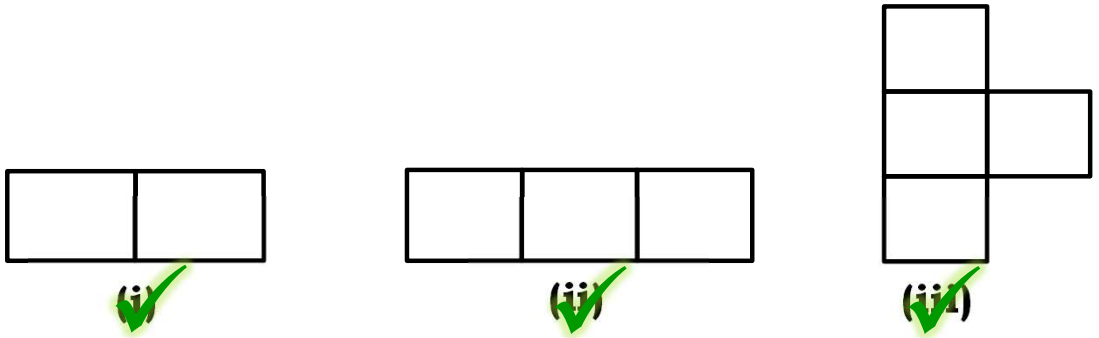




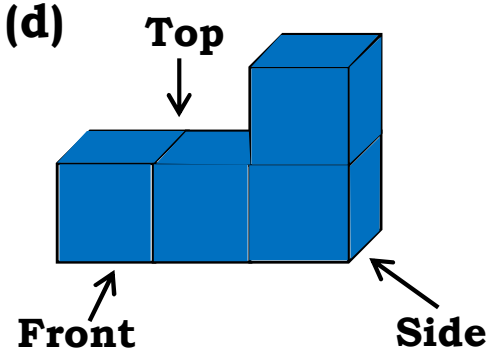
Q For each given solid, identify the **top view**, **side view** & **front view**.

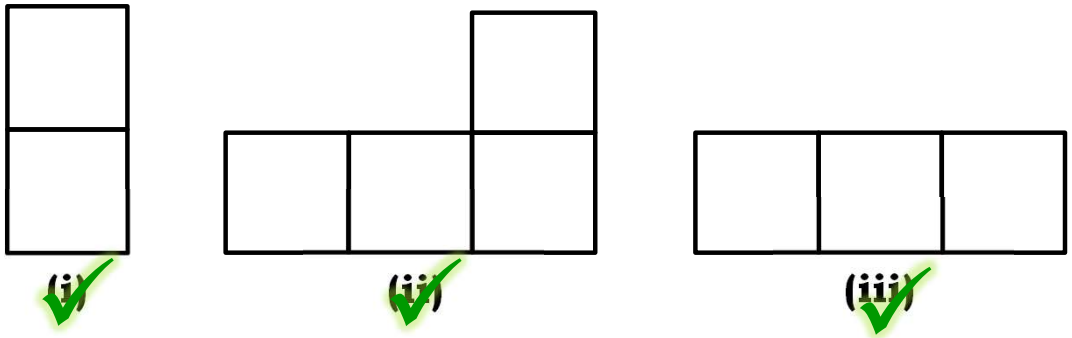
(c)





(d)

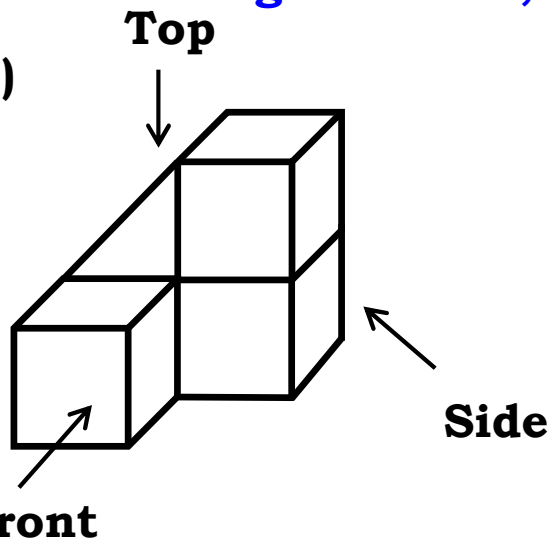


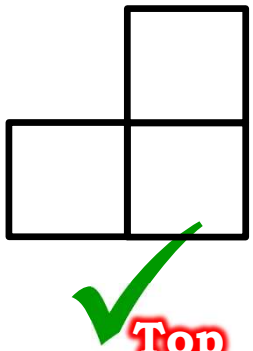


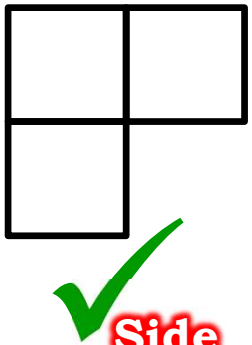
EXERCISE

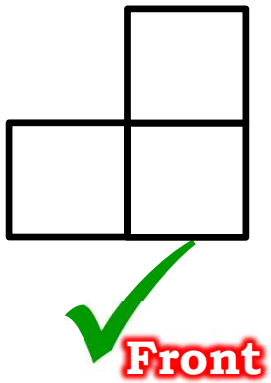
3. For each given solid, identify the top view, front view and side view.

(e)



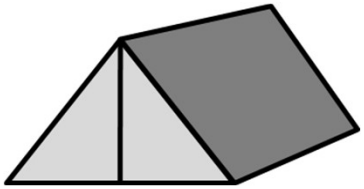
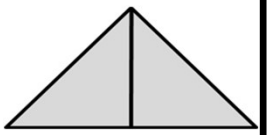
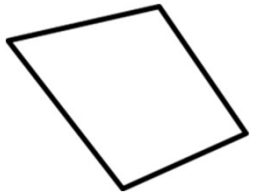
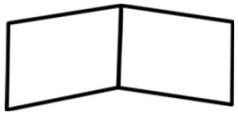
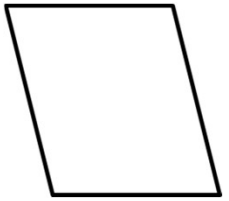






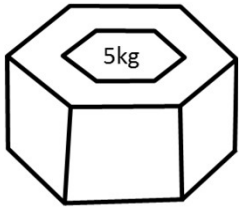
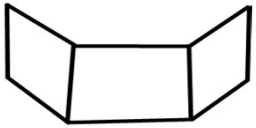
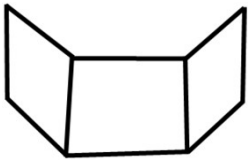
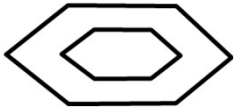
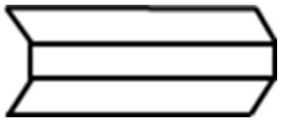
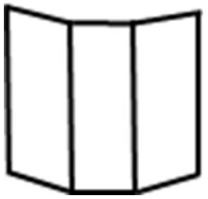



4. Draw the front view, side view and top view of the given objects:

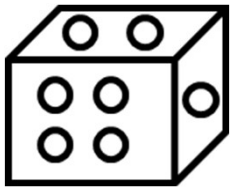
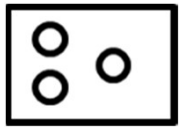
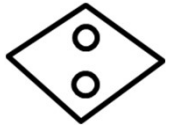
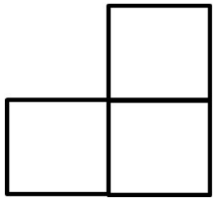
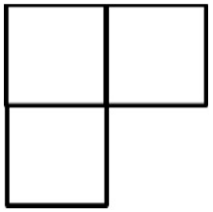
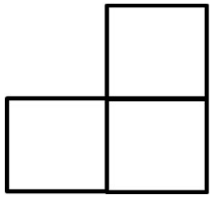
Sr No	Object	Front view	side view	Top view
a				
b				



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

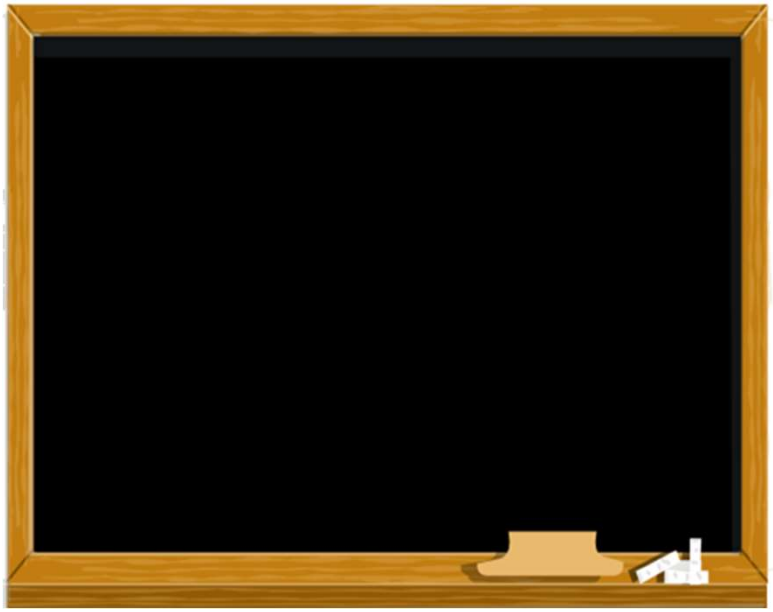
Sr No	Object	Front view	side view	Top view
c				
d				

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

Sr No	Object	Front view	side view	Top view
e				
f				

Q **Can a polygon have for its faces:**
i. 3 Triangles ?

Sol. **No, a polyhedron cannot have 3 triangles for its faces.**



1. Can a polygon have for its faces:

i. 3 Triangles ?

Sol. **No, a polyhedron cannot have 3 triangles for its faces**

ii. 4 triangles

Sol. **Yes, a polyhedron can have four triangles which is known as pyramid on triangular base.**

iii. a square and four triangles

Sol. **Yes, a polyhedron has its faces a square and four triangles which makes a pyramid on square base.**

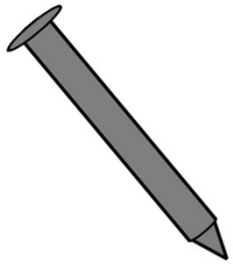
2. Is it possible to have a polyhedron with any given number of faces? (Hint: Think of a pyramid)

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

EXERCISE

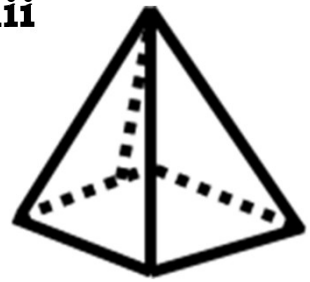
3. Which are prisms among the following:

i

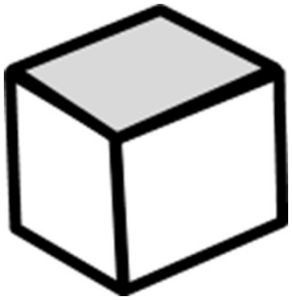


ii

iii



iv



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

4. How are prisms and cylinders alike?

Sol. **A prism becomes a cylinder as the number of sides of its base becomes larger and larger.**

ii. How are pyramids and cones alike?

Sol. **A pyramid becomes a cone as the number of sides of its base becomes larger and larger.**

5. Is a square prism same as a cube? Explain.

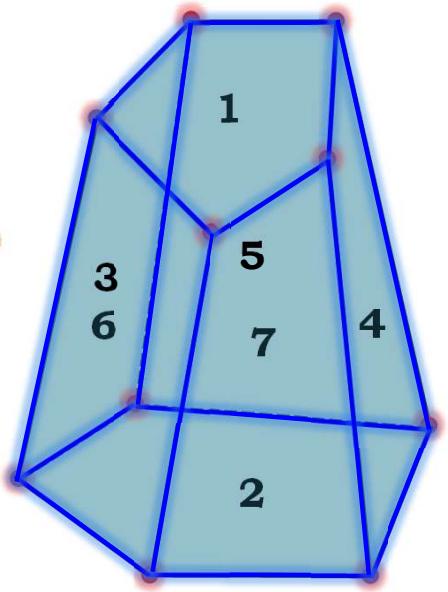
Sol. **No, it can be a cuboid also.**

Q **Verify Euler's formula for these solids.**

Sol. **F = 7, V = 10, E = 15**

$$\text{L.H.S} = F + V - E$$
$$= 7 + 10 - 15$$
$$= 17 - 15$$
$$= 2$$
$$\text{L.H.S} = \text{R.H.S.}$$

Euler's Formula
F + V – E = 2



(i)

Q **Verify Euler's formula for these solids.**

Sol. **F = 9, V = 9, E = 16**

L.H.S = F + V – E

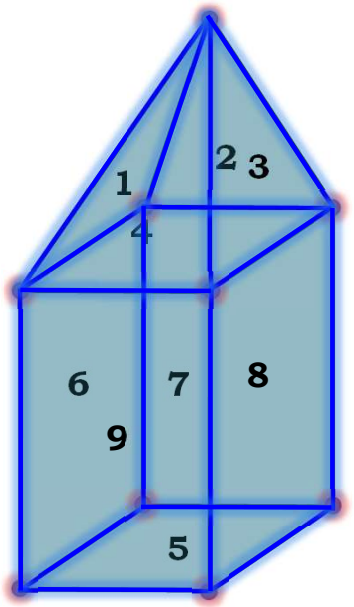
= 9 + 9 – 16

= 18 – 16

= 2

R.H.S = L.H.S

Euler's Formula
F + V – E = 2



(ii)

Q **Using Euler's formula, find the unknown:**

Faces	**8**	**5**	**20**
Vertices	**6**	**?**	**12**
Edges	**12**	**9**	**?**

Sol. **In first column, F = ?, V = 6 and E = 12**

Using Euler's formula,

$$F + V - E = 2$$

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

$$\therefore \quad F - 6 = 2$$

$$\therefore \quad F = 2 + 6$$

$$\therefore \quad F = 8$$

Hence there are 8 faces.

Q **Verify Euler's formula for these solids.**

Faces	**8**	**5**	**20**
Vertices	**6**	**?**	**12**
Edges	**12**	**9**	**?**

Sol. **In second column, F = 5, V = ? and E = 9**

Using Euler's formula,

$$F + V - E = 2$$

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

$$\therefore \quad V - 4 = 2$$

$$\therefore \quad V = 2 + 4$$

$$\therefore \quad V = 6$$

Hence there are 6 vertices.

Q **Verify Euler's formula for these solids.**

Faces	**8**	**5**	**20**
Vertices	**6**	**6**	**12**
Edges	**12**	**9**	**30**

Sol. **In third column, F = 20, V = 12 and E = ?**

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

$$F + V - E = 2$$

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

$$\therefore \quad 32 - E = 2$$

$$\therefore \quad E = 32 - 2$$

$$\therefore \quad E = 30$$

Hence there are 30 edges.

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

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

Then, we know Using Euler's formula,

$$L.H.S = F + V - E$$

$$= 10 + 15 - 20$$

$$= 25 - 20$$

$$L.H.S = 5$$

$$\therefore \quad R.H.S = 2$$

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

Euler's Formula
$F + V - E = 2$

Polyhedron having 10 faces, 20 edges and 15 vertices does not exist.