SpeedLabs

MATHS

ICSE 8th

TEEVRA EDUTECH PVT. LTD.

Visualizing Solid shapes

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

Ans.

(a) → (iii) → (iv)

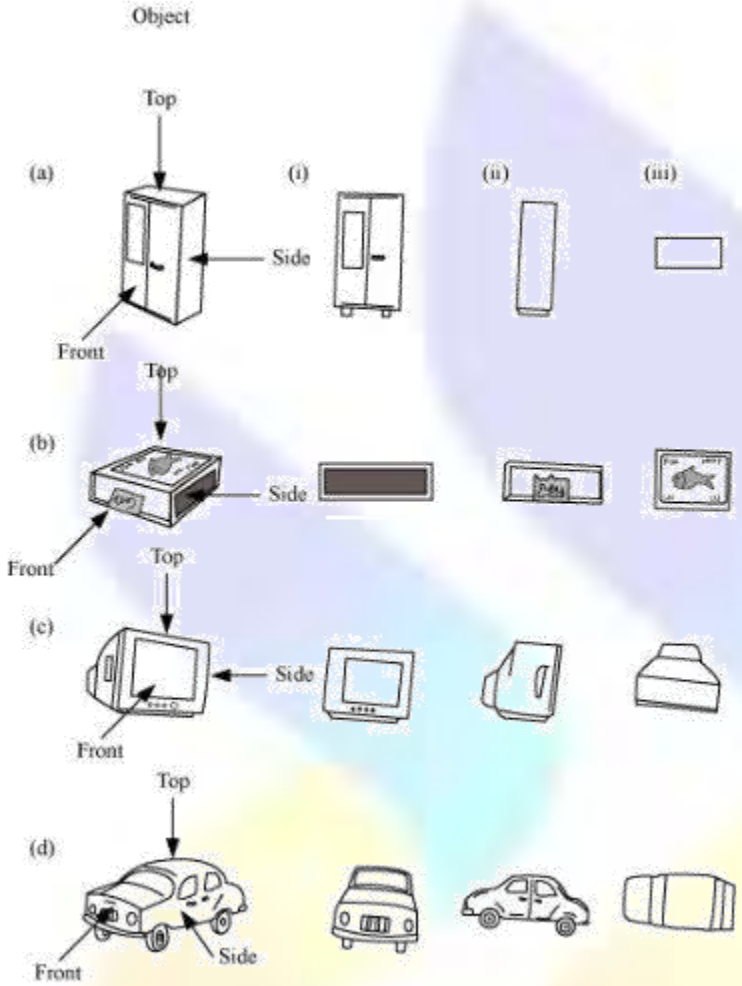
(b) →(i) → (v)

(c) → (iv) → (ii)

(d) → (v) → (iii)

(e) → (ii) → (i)

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



Ans:

(a) → (i) → Front (ii) → Side (iii) → Top view

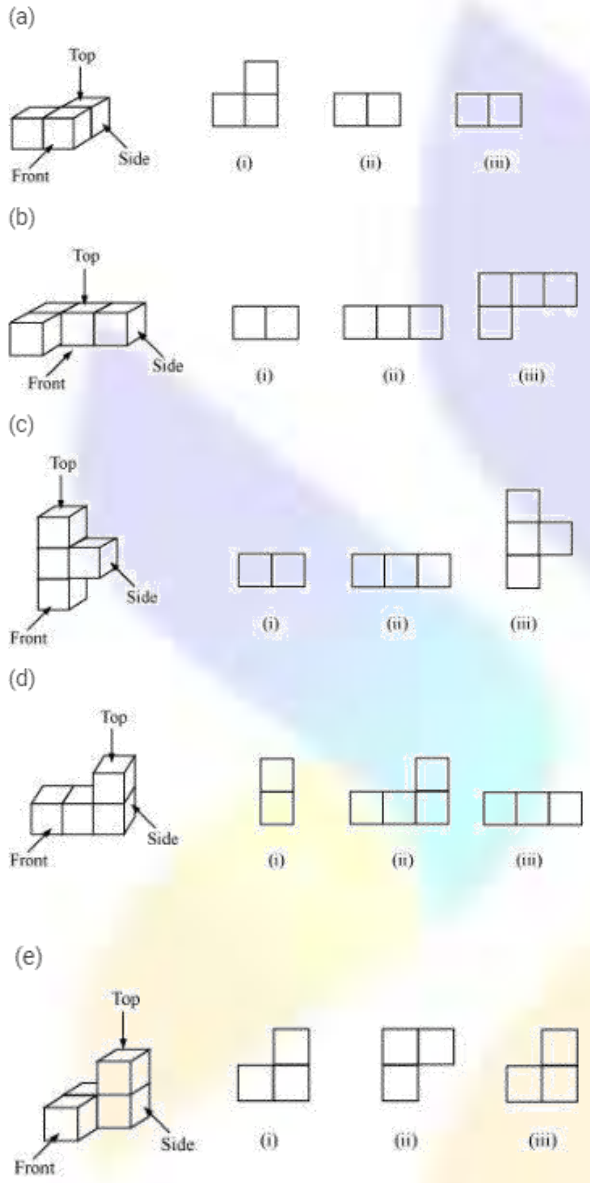
(b) → (i) → Side (ii) → Front (iii) →Top view

(c) → (i) →Front (ii) → Side (iii) → Top view

(d) → (i) → Front (ii) → Side (iii) → Top view

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

(a) A military tent (b) A table



Ans.

(a) →(i) → Top view (ii) →Front view (iii) → Side view

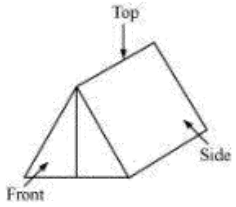
(b) → (i) → Side view (ii) → Front view (iii) →Top view

(c) → (i) → Top view (ii) →Side view (iii) → Front view

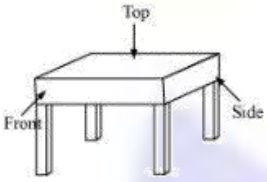
(d) → (i) → Side view (ii) →Front view (iii) →7 Top view

(e) → (i) → Front view (ii) → Top view (iii)→ Side view.

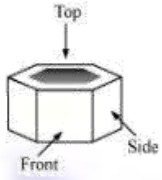
4. Draw the front view, side view and top view of the given objects.



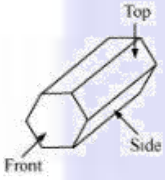
(a) A military tent



(b) A table

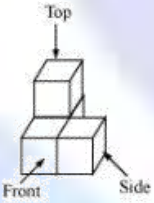


(c) A nut



(d) A hexagonal block

(e) A dice



(f) A solid

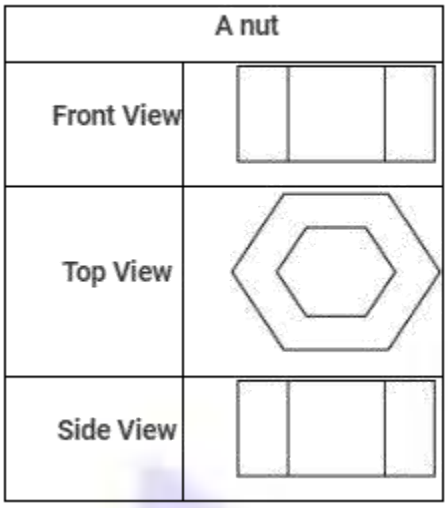
(a)

A military tent	
Front View	
Top View	
Side View	

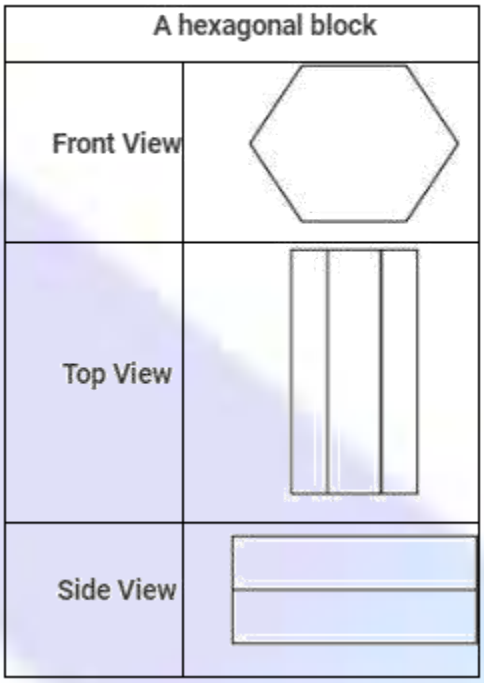
(b)

A table	
Front View	
Top View	
Side View	

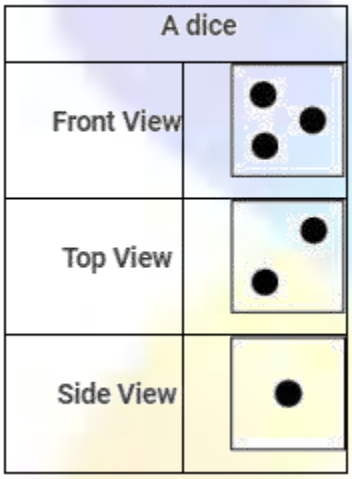
(c)



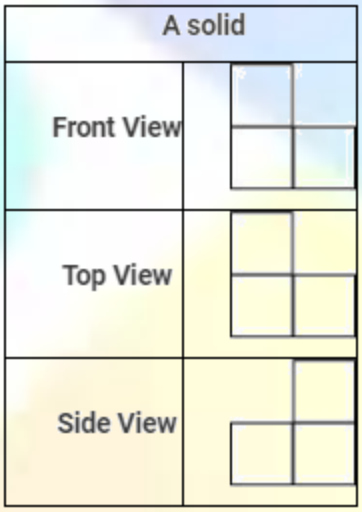
(d)



(e)



(f)



5. Look at the given map of a city.

(a) Colour the map as follows: Blue-water, red – fire station, orange - library, yellow-schools, Green- park, Pink-College, Purple-Hospital, Brown- Cemetery.

(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.

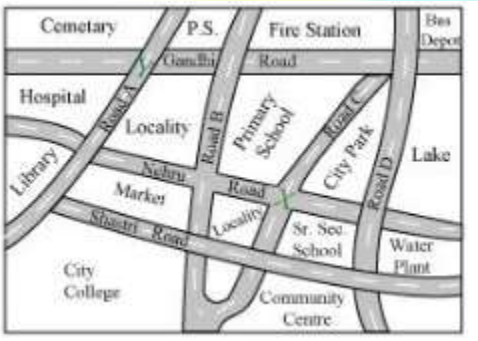
(d) Which is further east, the city park or the market'

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

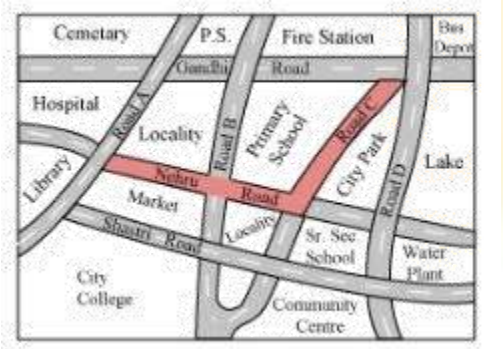
Ans

(a)The given map coloured in the required way is as follows.

(b)



(c) The shortest route from the library to bus depot is represented by red colour.



(d) Between the market and the city Park, the city Park is further east.

(e) Between the primary school and the Sr. Secondary school, the Sr.Secondary school is further south.

6. Can a polyhedron have for its faces

(i) 3 triangles?

(ii) 4 triangles?

(iii) A square and four triangles?

Ans

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

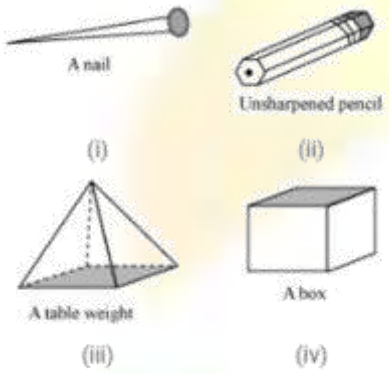
(ii) Yes, a polyhedron can have four triangles which is known as pyramid on triangular base.

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

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

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

8. Which are prisms among the following?



Ans Since, a prism is a polyhedron having two of its faces congruent and parallel, where as other faces are parallelogram.

(i) No, a nail is not a prism.

(ii) Yes, unsharpened pencil is a prism.

(iii) No, table weight is not a prism.

(iv) Yes, box is a prism

9. (i) How are prisms and cylinders alike?

(ii) How are pyramids and cones alike?

Ans

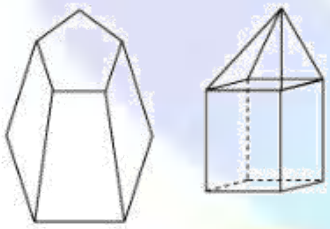
(i) A prism becomes a cylinder as the number of sides of' base becomes larger and larger.

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

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

Ans No, it can be a cuboid also.

11. Verify Euler's formula for these solids.



(i) (ii)

Ans (i) Fig. contains 7 faces, 10 vertices and 15 edges.

By using Euler's formula. We see F + V - E = 2.

Putting F = 7, V = 10 and E = 15

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

= 7 + 10 - 5

= 17 -15

= 2

L.H.S. = RH.S.

It verifies Euler's formula.

(ii) Fig. In this figure, there are 9 faces, 9 vertices and 16 edges.

By using Euler's formula

$F + V - E = 2$

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

$= 9 + 9 - 16$

$= 18 - 16$

$= 2$

L.H.S. = RH.S.

It verifies Euler's formula.

12. Using Euler's formula find the unknown:

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

Ans In first column

$F = ?, V = 6$ and $E = 12$

By using Euler's formula,

$F + V - E = 2$

$\Rightarrow F + 6 - 12 = 2$

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

Hence, there are 8 faces.

In second column

$F = 5, V = ?$ and $E = 9$

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

$\Rightarrow 5+V-9=2$

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

Hence, there are 6 vertices.

In third column

$F = 20, V = 12$ and $E = ?$

By using Euler's formula,

$F + V - E = 2$

$\Rightarrow 20 + 12 - E = 2$

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

Hence, required edges are 30.

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

Ans If $F = 10, V = 15$ and $E = 20$

We know by Euler's formula $F + V - E = 2$

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

$= 10 + 15 - 20 = 25 - 20 = 5$

L.H.S. $\neq$ RH.S.

No, it does not follow Euler's formula.

So, polyhedron cannot have 10 faces, 20 edges and 15 vertices