Unit 12(Practical Geometry Symmetry & Visualising Solid Shapes)

Multiple Choice Questions (MCQs)

Question 1:

A triangle can be constructed by taking its sides as

(a) 1.8 cm, 2.6 cm, 4.4 cm

(b) 2 cm, 3 cm, 4 cm

(c) 2.4 cm, 2.4 cm, 6.4 cm

(d) 3.2 cm, 2.3 cm, 5.5 cm

Solution:

(b) Triangle can be constructed only if they satisfy the given condition. Sum of two sides > Third side Clearly, only option (b) satisfies the given condition.

(2 + 3)cm > 4 cm i.e. 5 cm > 4 cm

Question 2:

A triangle can be constructed by taking two of its angles as

(a) 110°, 40° **(b)** 70°, 115°

(c) 135°, 45° **(d)** 90°, 90°

Solution:

(a) We know that, the sum of all the angles of a triangle is equal to 180°. So, sum of any two angles of a triangle should be less than 180°.

110°+ 40° = 150° i.e. less than 180°.

70° + 115° = 185° i.e. greater than 180°.

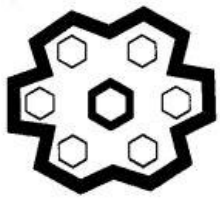
135° + 45°= 180° i.e. equal to 180°.

90° + 90°= 180° i.e. equal to 180°.

Hence, **(a)** is the correct option.

Question 3:

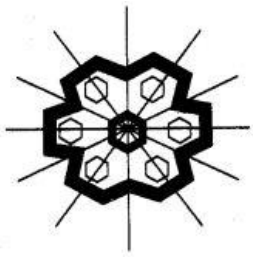
The number of lines of symmetry in the figure given below is



(a) 4 **(b)** 8 **(c)** 6 **(d)** infinitely many

Solution:

(c) given figure has 6 lines of symmetry.



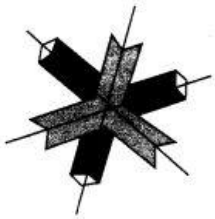
Question 4:

The number of lines of symmetry in the figure given below is

(a) 1 **(b)** 3 **(c)** 6 **(d)** infinitely many

Solution:

(b) The given figure has 3 lines of symmetry.



Question 5:

The order of rotational symmetry in the figure given below is

(a) 4 **(b)** 8 **(c)** 6 **(d)** infinitely many

Solution:

(c) Since, the number of times a figure fits onto itself in one full turn is called order of rotational symmetry.

Therefore, the given figure has rotational symmetry of order 6.

Question 6:

The order of rotational symmetry in the figure given below is

(a) 4 **(b)** 2 **(c)** 1 **(d)** infinitely many

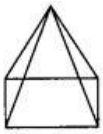
Solution:

(b) Since, the number of times a figure fits onto itself in one full turn is called order of rotational symmetry.

So, the given figure has rotational symmetry of order 2.

Question 7:

The name of the given solid in the figure is



(a) triangular pyramid **(b)** rectangular pyramid

(c) rectangular prism **(d)** triangular prism

Solution:

(b) it is a combination of rectangle and pyramid.

Hence, **(b)** is the correct option.

Question 8:

The name of the solid in figure is

(a) triangular pyramid **(b)** rectangular prism

(c) triangular prism **(d)** rectangular pyramid

Solution:

(c) It is a combination of triangle and prism.

Hence, **(c)** is the correct option.

Question 9:

All faces of a pyramid are always

(a) triangular **(b)** rectangular **(c)** congruent **(d)** None of these

Solution:

(d) The faces of a pyramid can be triangular and rectangular.

Hence, **(d)** is the correct option.

Question 10:

A solid that has only one vertex is

(a) pyramid **(b)** cube **(c)** cone **(d)** cylinder

Solution:

(c) The cone is the shape, that has only one vertex.

Hence, **(c)** is the correct option.

Question 11:

Out of the following which is a 3-D figure?

(a) Square **(b)** Sphere **(c)** Triangle **(d)** Circle

Solution:

(b) Square, triangle and circle are 2-D figures while sphere is the 3-D figure.

Hence, **(b)** is the correct option.

Question 12:

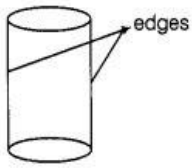
Total number of edges a cylinder has

(a) 0 **(b)** 1

(c) 2 **(d)** 3

Solution:

(c) The cylinder has 2 edges.



Hence, **(c)** is the correct option.

Question 13:

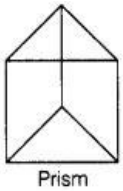
A solid that has two opposite identical faces and other faces as parallelograms is a

(a) prism **(b)** pyramid

(c) cone **(d)** sphere

Solution:

(a) Prism has two opposite identical faces and other faces as parallelograms.



Question 14:

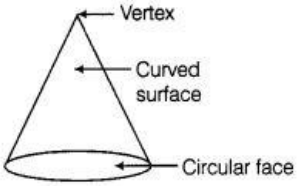
The solid with one circular face, one curved surface and one vertex is known as

(a) cone **(b)** sphere

(c) cylinder **(d)** prism

Solution:

(a) Cone has one circular face, one curved surface and one vertex.



Question 15:

If three cubes each of edge 4 cm are placed end to end, then the dimensions of resulting solid are

(a) 12 cm x 4 cm x 4 cm **(b)** 4 cm x 8 cm x 4 cm

(c) 4 cm x 8 cm x 12 cm **(d)** 4 cm x 6 cm x 8 cm

Solution:

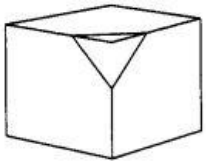
(a) If the three cubes are placed end to end that means length is increased. The new cuboid having dimensions 12cmx4cmx4cm Hence, **(a)** is the correct option.

Question 16:

When we cut a corner of a cube as shown in the figure, we get the cutout piece as

(a) square pyramid **(b)** trapezium prism

(c) triangular pyramid **(d)** a triangle



Solution:

(c) If we cut a corner of a cube, then we get cut-out of a piece in the form of triangular pyramid.

Question 17:

If we rotate a right-angled triangle of height 5 cm and base 3 cm about its height a full turn, we get

(a) cone of height 5 cm, base 3 cm

(b) triangle of height 5 cm, base 3 cm

(c) cone of height 5 cm, base 6 cm

(d) triangle of height 5 cm, base 6 cm

Solution:

(a) If we rotate a right-angled triangle of height 5 cm and base 3 cm about its height a full turn, then we get a cone of height 5 cm and base 3 cm.

Question 18:

If we rotate a right-angled triangle of height 5 cm and base 3 cm about its base/we get

(a) cone of height 3 cm and base 3 cm

(b) cone of height 5 cm and base 5 cm

(c) cone of height 5 cm and base 3 cm

(d) cone of height 3 cm and base 5 cm

Solution:

(d) If we rotate a right-angled triangle of height 5 cm and base 3 cm about its base, we get a cone of height 3 cm and base 5 cm.

Question 19:

When a torch is pointed towards one of the vertical edges of a cube you get a shadow of cube in the shape of

(a) square **(b)** rectangle but not a square

(c) circle **(d)** triangle

Solution:

(b) When a torch is pointed towards one of the vertical edges of a cube, you get a shadow of cube in the shape of rectangle but not a square.

Question 20:

Which of the following sets of triangles could be the lengths of the sides of a right-angled triangle?

(a) 3 cm, 4 cm, 6 cm **(b)** 9 cm, 16 cm, 26 cm

(c) 1.5 cm, 3.6 cm, 3.9 cm **(d)** 7 cm, 24 cm, 26 cm

Solution:

(c) The sides of right-angled triangle must satisfy Pythagoras theorem.

$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$

Note: Hypotenuse is the largest side of all the sides. So, check all options by putting the values in above formula.

Let us check all the options.

(a) $(6)^2 = (3)^2 + (4)^2$

$36=9+16$

$36 \neq 25$

(b) $(26)^2 = (16)^2 + (9)^2 = 676$

$= 256 + 81$

$676 \neq 337$

(c) $(3.9)^2 = (1.5)^2 + (3.6)^2 = 15.21$

$= 2.25+12.96$

$=15.21 = 15.21$ (satisfied)

(d) $(26)^2 = (7)^2 + (24)^2$

$= 676 = 49+576$

$=676 \neq 625$

Clearly, option (c) is correct.

Question 21:

In which of the following cases, a unique triangle can be drawn?

(a) AB = 4 cm, BC = 8 cm and CA = 2 cm

(b) BC = 52 cm, ∠B = 90° and ∠C =110°

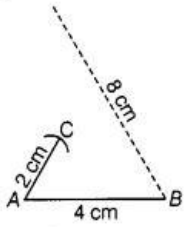
(c) XV = 5 cm, ∠X = 45°and ∠Y = 60°

(d) An isosceles triangle with the length of each equal side 6.2 cm

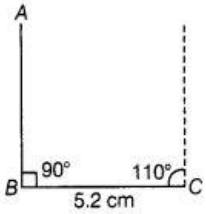
Solution:

(c) Let us draw the triangle according to measurements given in respective options.

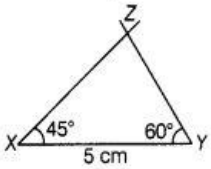
For (a) As we can see, triangle cannot be drawn.



For (b) Triangle cannot be formed.



For (c) Unique triangle can be drawn by these measurements.

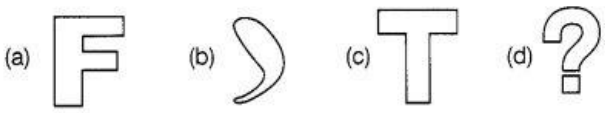


For (d) Using given data, we can form as many triangles as we want.

Hence, option (c) is correct.

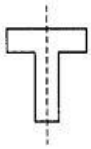
Question 22:

Which of the following has a line of symmetry?



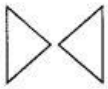
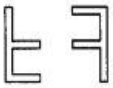
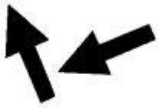
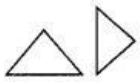
Solution:

(c) The following figure has one line of symmetry.



Question 23:

which of the following was reflection to each other?

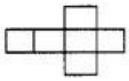
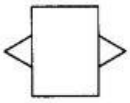
(a)  (b)  (c)  (d) 

Solution:

(a),since in the figure(a) the image of one side of the figure is exactly same as the figure on the other side of the line of symmetry.

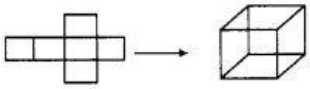
Question 24:

Which of these nets is a net of a cube?

(a)  (b)  (c)  (d) 

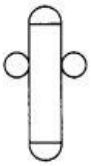
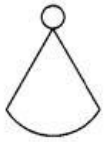
Solution:

(b)



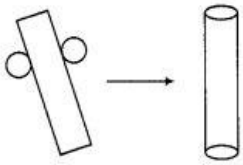
Question 25:

Which of the following nets is a net of a cylinder?

(a)  (b)  (c)  (d) 

Solution:

(c)



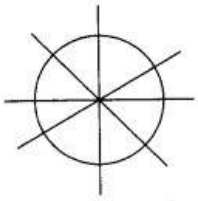
Question 26:

Which of the following letters of English alphabets have more than 2 lines of symmetry?

(a) Z (b) O (c) E (d) H

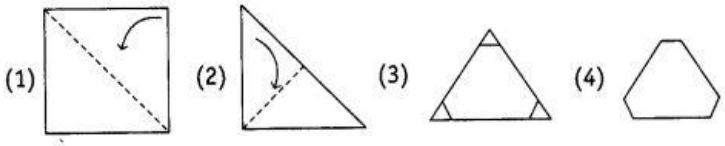
Solution:

(c) The letter 0 has more than two lines of symmetry.

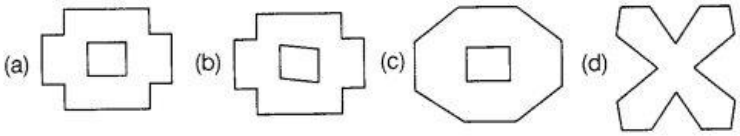


Question 27:

Take a square piece of paper as shown in figure (1). Fold it along its diagonals as shown in figure (2). Again fold it as shown in figure (3). Imagine that you have cut off 3 pieces of the form of congruent isosceles right-angled triangles out of it as shown in figure 4.



On opening the piece of paper which of the following shapes will you get?

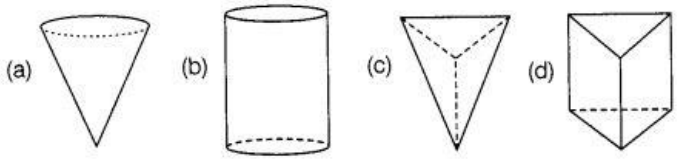


Solution:

(a) As per the given condition, if we open the piece of paper, we will get the figure as shown in option (a).

Question 28:

Which of the following 3-dimensional figures has the top, side and front as triangles?



Solution:

(c) Figure in option **(c)** will show all (top, side and front) views as triangle.

Fill in the Blanks

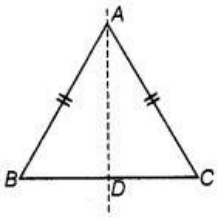
In questions 29 to 58, fill in the blanks to make the statements true.

Question 29:

In an isosceles right triangle, the number of lines of symmetry is ……

Solution:

Since, an isosceles triangle has one line of symmetry which is along the median through the vertex,



Question 30:

Rhombus is a figure that has ……. lines of symmetry and has a rotational symmetry of order ……

Solution:

two, two

A rhombus has two lines of symmetry along the diagonal and has a rotational symmetry of order two.

Question 31:

……. triangle is a figure that has a line of symmetry but lacks rotational symmetry.

Solution:

Isosceles

An isosceles triangle is a figure that has a line of symmetry but lacks rotational symmetry.

Question 32:

……. is a figure that has neither a line of symmetry nor a rotational symmetry.

Solution:

Quadrilateral

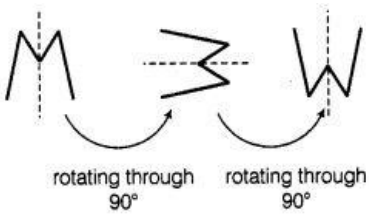
Quadrilateral is a figure that has neither a line of symmetry nor a rotational symmetry.

Question 33:

……. and ……. are the capital letters of English alphabets that have one line of symmetry but they interchange to each other when rotated through 180°.

Solution:

M,W

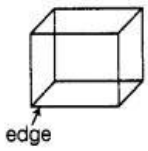


Question 34:

The common portion of two adjacent faces of a cuboid is called …….

Solution:

edge



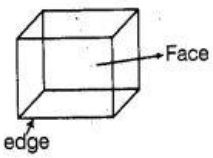
The common portion of two adjacent faces of a cuboid is called edge.

Question 35:

A plane surface of a solid enclosed by edges is called …….

Solution:

face



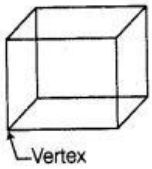
A plane surface of a solid enclosed by edges is called face.

Question 36:

The corners of solid shapes are called its ……

Solution:

vertices



The corners of solid shapes are called its vertices.

Question 37:

A solid with no vertex is ……

Solution:

sphere

Since, a sphere is a solid with 0 vertex, 0 edge and 1 curved surface,

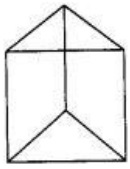
Question 38:

A triangular prism has …… faces, ……. edges and ……. vertices.

Solution:

5,9,6

A triangular prism has 5 faces, 9 edges and 6 vertices.



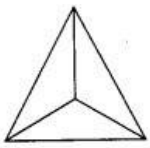
Question 39:

A triangular pyramid has …… faces, ……. edges and ……. vertices.

Solution:

4,6,4

A triangular pyramid has 4 faces, 6 edges and 4 vertices.



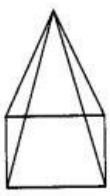
Question 40:

A square pyramid has …….. faces, …….. edges and ……. vertices.

Solution:

5,8,5

A square pyramid has 5 faces, 8 edges and 5 vertices.

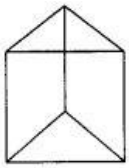


Question 41:

Out of ……. faces of a triangular prism,…….. are rectangles and ……. are triangles.

Solution:

Out of 5 faces of a triangular prism, 3 are rectangles and 2 are triangles.

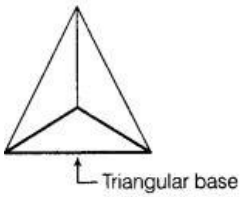


Question 42:

The base of a triangular pyramid is a …….

Solution:

The base of a triangular pyramid is a triangle.

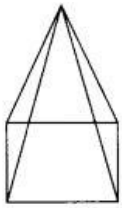


Question 43:

Out of ……. faces of a square pyramid, ……. are triangles and is/are squares.

Solution:

Out of 5 faces of a square pyramid, 4 are triangles and 1 is square.

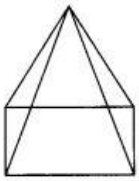


Question 44:

Out of …… faces of a rectangular pyramid, …… are triangles and base is …….

Solution:

Out of 5 faces of a rectangular pyramid, 4 are triangles and base is rectangle.



Question 45:

Each of the letters H, N, S and Z has a rotational symmetry of order …….

Solution:

2

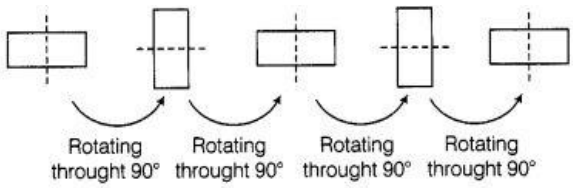
Each of the letters H,N,S and Z has a rotational symmetry of order two.

Question 46:

Order of rotational symmetry of a rectangle is ……..

Solution:

Order of rotational symmetry of a rectangle is two.



Question 47:

Order of rotational symmetry of a circle is …….

Solution:

Since, the number of times a figure fits onto itself in one complete rotation is called the order of rotational symmetry.

Order of rotational symmetry of a circle is 2.

Question 48:

Each face of a cuboid is a ……..

Solution:

Since, a solid bounded by six rectangular faces is called a cuboid.

∴ Each face of a cuboid is a rectangle.

Question 49:

Line of symmetry for an angle is its …….

Solution:

Line of symmetry for an angle is its bisector.

Question 50:

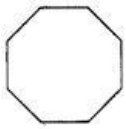
A parallelogram has …….. line of symmetry.

Solution:

A parallelogram has no line of symmetry.

Question 51:

Order of rotational symmetry of



is ____.

Solution:

8

Since, the order of rotational symmetry is the number of times a figure fits onto itself in one full turn.

∴ Order of rotational symmetry of a given figure is 8.

Question 52:

A ……. triangle has no lines of symmetry.

Solution:

scalene

Since, all the angles and sides are unequal in scalene triangle.

Question 53:

Cuboid is a rectangular …….

Solution:

prism

Since, rectangular prism and cuboid refer to the same solid.

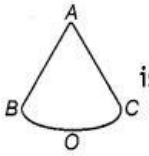
Question 54:

A sphere has …….. vertex, …….. edge and ……. curved surface.

Solution:

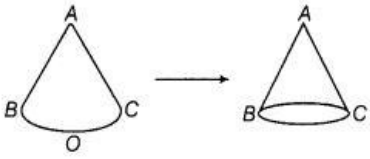
A sphere has 0 vertex, 0 edge and 1 curved surface.

Question 55:

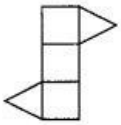


is a net of a ____. Circumference of circle = ____.

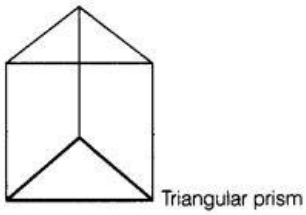
Solution:



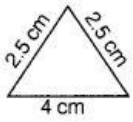
Question 56:


is a net of a ____.

Solution:



Question 57:

Order of rotational symmetry of 

is ____.

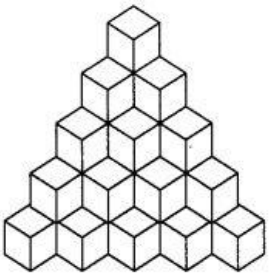
Solution:

1

Since, isosceles triangle has rotational symmetry of order 1.

Question 58:

Identical cubes are stacked in the corner of a room as shown below. The number of cubes that are not visible are .



Solution:

20

The number of cubes that are not visible are 20.

True/False

In questions 59 to 92, state whether the given statements are True or False.

Question 59:

We can draw exactly one triangle whose angles are 70°, 30° and 80°.

Solution:

False

Since, we can draw infinite triangles of angles 70°, 30° and 80° all having different sides.

Question 60:

The distance between the two parallel lines is the same everywhere.

Solution:

True

Since, the distance between the two parallel lines is always same everywhere.

Question 61:

A circle has two lines of symmetry.

Solution:

False

Since, a circle has infinite lines of symmetry.

Question 62:

An angle has two lines of symmetry.

Solution:

False

Since, an angle has only one line of symmetry i.e. its bisector.

Question 63:

A regular hexagon has six lines of symmetry .

Solution:

True

Since, a regular polygon has many lines of symmetry as the number of its sides.

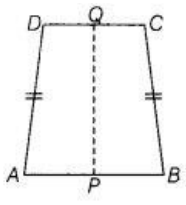
Question 64:

An isosceles trapezium has one line of symmetry.

Solution:

True

Isosceles trapezium has only one line of symmetry along the line segment joining the mid-points of two parallel sides which is shown in figure.



Question 65:

A parallelogram has two lines of symmetry.

Solution:

False

Because in a parallelogram, there is no line of symmetry.

Question 66:

Order of rotational symmetry of a rhombus is four.

Solution:

False

Order of rotational symmetry of a rhombus is two,

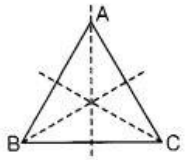
Question 67:

An equilateral triangle has six lines of symmetry.

Solution:

False

Since, in an equilateral triangle, there are three lines of symmetry along the three medians of the triangle.



Question 68:

Order of rotational of a semi circle is two.

Solution:

False

Order of rotational symmetry of a semi circle is one.

Question 69:

In oblique sketch of the solid, the measurements are kept proportional.

Solution:

False

In oblique sketch of the solid, the measurements are not kept proportional.

Question 70:

An isometric sketch does not have proportional length.

Solution:

False

An isometric sketch always have proportional length.

Question 71:

A cylinder has no vertex.

Solution:

True

A cylinder has 3 faces, 2 edges but no vertex.

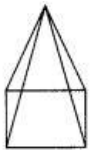
Question 72:

All the faces, except the base of a square pyramid are triangular.

Solution:

True

A square pyramid has 4 triangular faces and one square base.



Question 73:

A pyramid has only one vertex.

Solution:

False

A pyramid has atleast 4 vertices (in triangular pyramid).

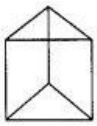
Question 74:

A triangular prism has 5 faces, 9 edges and 6 vertices.

Solution:

True

A triangular prism has 5 faces, 9 edges and 6 vertices.



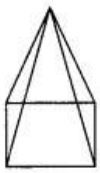
Question 75:

If the base of a pyramid is a square, it is called a square pyramid.

Solution:

True

The name of a pyramid is based on the base of pyramid. So, if the base of a pyramid is a square, then it is called a square pyramid.



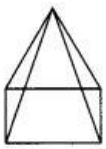
Question 76:

A rectangular pyramid has 5 rectangular faces.

Solution:

False

A rectangular pyramid has 1 rectangular face and 4 triangular faces.



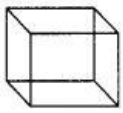
Question 77:

Rectangular prism and cuboid refer to the same solid.

Solution:

True

Rectangular prism and cuboid refer to the same solid.



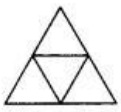
Question 78:

A tetrahedron has 3 triangular faces and 1 rectangular face.

Solution:

False

A tetrahedron has 4 triangular faces.



Question 79:

While rectangle is a 2-D figure, cuboid is a 3-D figure.

Solution:

True

A rectangle is a 2-D figure and cuboid is a 3-D figure.

Question 80:

While sphere is a 2-D figure, circle is a 3-D figure.

Solution:

False

Circle is a 2-D figure and sphere is a 3-D figure.

Question 81:

Two dimensional figures are also called plane figures.

Solution:

True

2-D figures are also called plane figures.

Question 82:

A cone is a polyhedron.

Solution:

False

A cone is not a polyhedron.

Question 83:

A prism has four bases.

Solution:

False

A prism has only one base.

Question 84:

The number of lines of symmetry of a regular polygon is equal to the vertices of the polygon.

Solution:

True

The number of lines of symmetry of a regular polygon is equal to the vertices of the polygon.

Question 85:

The order of rotational symmetry of a figure is 4 and the angle of rotation is 180° only.

Solution:

False

If the order of rotational symmetry of a figure is 4, then the angle of rotation must be 90°,

Question 86:

After rotating a figure by 120° about its centre, the figure coincides with its original position. This will happen again, if the figure is rot
ated at an angle of 240°.

Solution:

True

After rotating a figure by 120° about its centre, the figure coincides with its original position. This will happen again, if the figure is rotated at an angle of 240°.

Question 87:

Mirror reflection leads to symmetry always.

Solution:

False

Mirror reflection not always lead to symmetry.

Question 88:

Rotation turns an object about a fixed point which is known as centre of rotation.

Solution:

True

Centre of rotation turns an object about a fixed point.

Question 89:

Isometric sheet divides the paper into small isosceles triangles made up of dots or lines.

Solution:

False

Isometric sheet divides the paper into small equilateral triangles made up of dots or lines.

Question 90:

The circle, the square, the rectangle and the triangle are examples of plane figures.

Solution:

True

The circle, the square, the rectangle and the triangle are examples of plane figures.

Question 91:

The solid shapes are of 2-dimensional.

Solution:

False

The solid shapes are of 3-dimensional.

Question 92:

Triangle with length of sides as 5cm, 6cm and 11cm can be constructed.

Solution:

False

We know that,

in a triangle, sum of any two sides is always greater than or equal to the third side.

5+6 = 11

6+ 11 ≥ 5

These measurements do not satisfy the basic condition of a triangle.

Hence, the triangle cannot be constructed.

Question 93:

Draw the top, side and front views of the solids given below in figures 12.21 and 12.22.

(i)

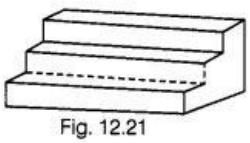


Fig. 12.21

(ii)

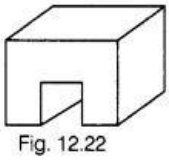
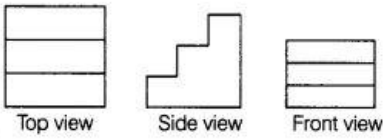


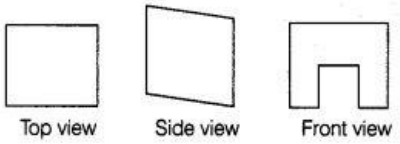
Fig. 12.22

Solution:

For given figure (i),

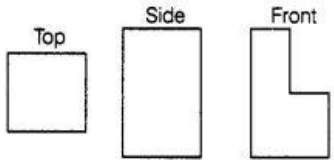


For given figure (ii),

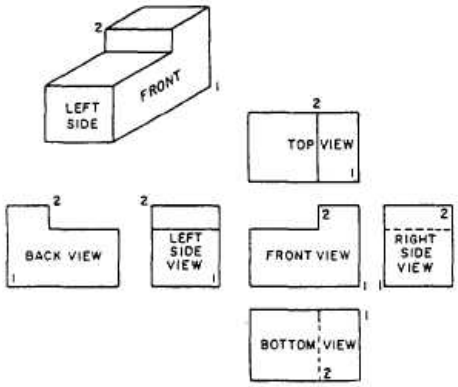


Question 94:

Draw a solid using the top, side and front views as shown below. [Use Isometric Paper.]



Solution:



Question 95:

Construct a right angled triangle whose hypotenuse measures 5 cm and one of the other sides measures 3.2 cm.

Solution:

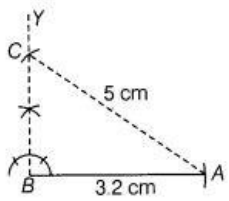
Steps of construction

Step I Draw a line AB = 3.2 cm.

Step II Construct a right angle (90°) at point B, i.e. ∠ABY = 90°

Step III Now, from point A, cut an arc 5 cm on BY at C.

Step IV Joint C to A.



Hence, ΔABC is the required triangle, having hypotenuse AC = 5 cm and AB = 32 cm.

Question 96:

Construct a right angled isosceles triangle with one side (other than hypotenuse) of

length 4.5 cm.

Solution:

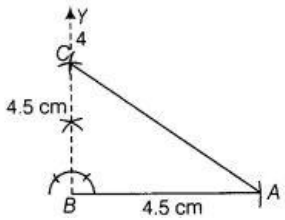
Steps of construction

Step I Draw a line AB = 4.5 cm.

Step II Construct a right angle (90°) at point B, i.e. ∠ABY = 90°.

Step III From point B, cut an arc 4.5 cm on BY at C.

Step IV Join C to A.



Hence, ΔABC is the required triangle having AB – AC = 4.5 cm.

Question 97:

Draw two parallel lines at a distance of 2.2 cm apart.

Solution:

Steps of construction

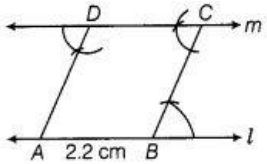
Step I Draw a line l and mark a point C outside it.

Step II Take a point B on line l and join BC.

Step III Draw line parallel to line l passing through C.

Step IV Mark a point D on line m, at a distance of 2.2 cm from C. Step V Through D draw AD || BC.

Line l is parallel to line m



Also, AD || BC, AB = DC = 2.2 cm

Question 98:

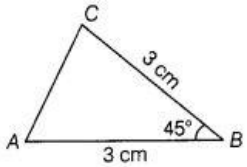
Draw an isosceles triangle with each of equal sides of length 3 cm and the angle between them as 45°.

Solution:

Steps of construction

Step I Firstly, we draw a rough sketch of triangle with given measures marked on it.

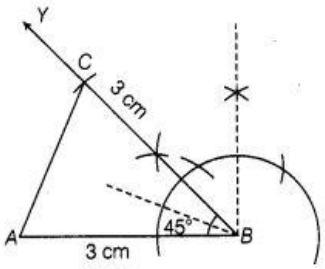
Step II Draw a line segment AB of length 3 cm.



Step III Draw an angle of 45° on point B and produce it to ray Y.

Step IV With B as centre, draw an arc of 3 cm which intersects ray BY at C.

Step V Join AC.



Thus, AABC is the required isosceles triangle.

Question 99:

Draw a triangle whose sides are of lengths 4 cm, 5 cm and 7 cm.

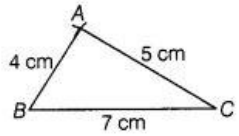
Solution:

Let us assume that given sides are BC =7 cm, AS = 4 cm and AC = 5 cm Steps of construction

Step I Draw a line BC = 7 cm Step II With centre B and radius 4 cm draw an arc.

Step III With centre C and radius 5 cm, draw an arc which cuts the previous arc at A.

Step IV Join AB and AC.



Hence, ΔABC is the required triangle in which AB = 4 cm, BC =7 cm and AC = 5 cm

Question 100:

Construct an obtuse angled triangle which has a base of 5.5 cm and base angles of 30° and 120°.

Solution:

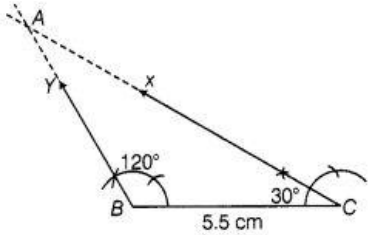
Steps of construction

Step I Draw a line segment SC of length 5.5 cm.

Step II Draw an angle of 120° on point S and produce it to ray Y.

Step III Draw an angle of 30° on point C and produce it to ray X.

Step IV Extend BY and CX to intersect at point A.



Hence, ΔABC is the required triangle with BC = 5.5, ∠ABC = 120° and ∠ACB = 30°.

Question 101:

Construct an equilateral triangle ABC of side 6 cm.

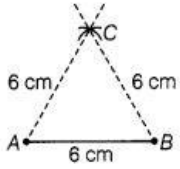
Solution:

Steps of construction

Step I Draw a line segment AB = 6 cm Step II Draw an arc of radius 6 cm from point A.

Step III Now, draw another arc of radius 6 cm from point B to cut previous arc at C.

Step IV Join A to C and B to C.



Hence, ΔABC is the required triangle.

Question 102:

By what minimum angle does a regular hexagon rotate so as to coincide with its origional position for the first time?

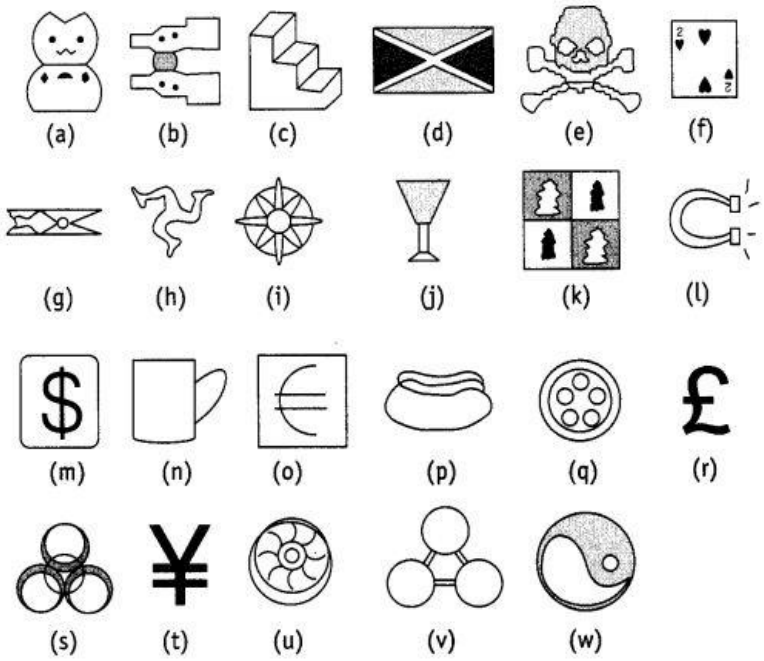
Solution:

A regular hexagon must be rotated through a minimum angle of 60°. So, that it can coincide with its original position for the first time. Because the angle of rotation of hexagon

$$= \frac{360°}{\text{Number of sides}} = \frac{360°}{6} = 60°$$

Question 103:

In each of the following figures, write the number of lines of symmetry and order of rotational symmetry.



[**Hint** Consider these as 2-D figures not as 3-D objects.]

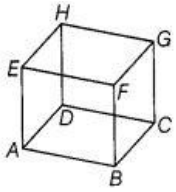
Solution:

Figure	Number of lines of symmetry	Order of rotational Symmetry
a	1	1
b	1	1
c	1	1
d	2	2
e	1	2
f	0	1
g	1	1
h	0	3
i	4	4
j	1	1
k	0	1
l	1	1
m	0	2
n	0	1
o	1	1
p	0	1
q	1	1
r	0	1
s	3	3
t	1	1
u	10	10
v	3	3
w	0	1

Question 104:

In the figure of a cube,

1. which edge is the intersection of faces EFGH and EFBA?
2. which faces intersect at edge FB?
3. which three faces form the vertex A?
4. which vertex is formed by the faces ABCD, ADHE and CDHG?
5. Give all the edges that are parallel to edge AB.
6. Give the edges that are neither parallel nor perpendicular to edge BC.
7. Give all the edges that are perpendicular to edge AB.
8. Give four vertices that do not all lie in one plane.



Solution:

1. From the given figure, we can observe that EF is the intersection of faces EFGH and EFBA.
2. From the given figure, we can observe that faces EFBA and FBCG intersect at edge FB.
3. Faces ABFE, ADHE and ABCD form the vertex A,
4. Vertex D is formed by the faces ABCD, CDHG and ADHE.
5. The edges parallel to edge AB are CD, EF and HG.
6. From the given figure, we can observe that edges AE, EF, GH and HD are neither parallel nor perpendicular to edge BC.
7. From the given figure, we can observe that edges AE, BF, AD and BC are

perpendicular to edge AB.

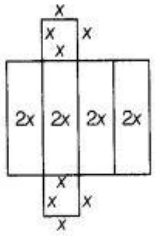
8. Vertices A, B, G and H do not lie in one plane.

Question 105:

Draw a net of a cuboid having same breadth and height, but length double the breadth.

Solution:

Required net of a cuboid will be



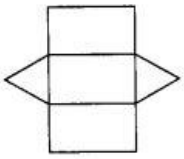
Question 106:

Draw the nets of the following

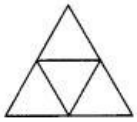
1. Triangular prism
2. Tetrahedron
3. Cuboid

Solution:

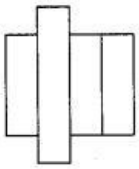
(i) Net for triangular prism



(ii) Net for tetrahedron,

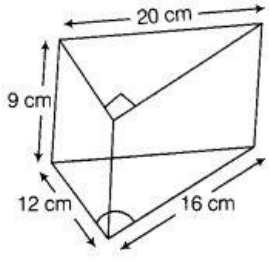


(iii) Net for cuboid,



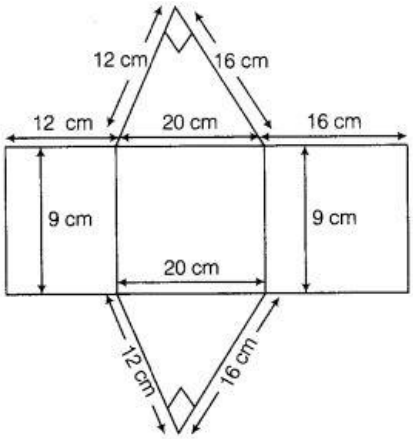
Question 107:

Draw a net of the solid given in the figure



Solution:

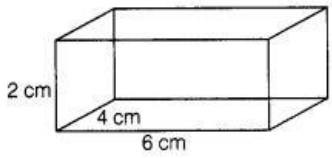
The net of the given solid figure will be



Question 108:

Draw an isometric view of a cuboid 6 cm x 4 cm x 2 cm.

Solution:

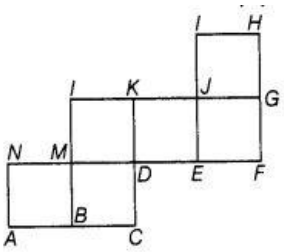


Isometric view of a cuboid = 6 cm x 4 cm x 2 cm = l x b x h.

Question 109:

The net given below in the figure can be used to make a cube.

1. Which edge meets AN?
2. Which edge meets DE?



Solution:

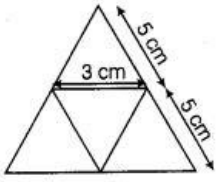
1. The given net of a cube shows that edge GH meets edge AN.
2. The given net of a cube shows that edge DC meets edge DE.

Question 110:

Draw the net of triangular pyramid with base as equilateral triangle of side 3 cm and slant edges 5 cm.

Solution:

The net of such triangular pyramid will be

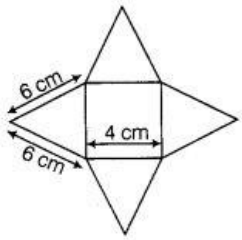


Question 111:

Draw the net of a square pyramid with base as square of side 4 cm and slant edges 6 cm.

Solution:

The net of such square pyramid will be

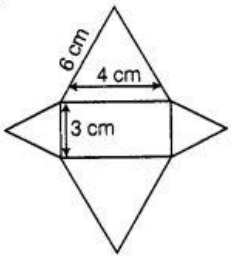


Question 112:

Draw the net of rectangular pyramid with slant edge 6 cm and base as rectangle with length 4 cm and breadth 3 cm.

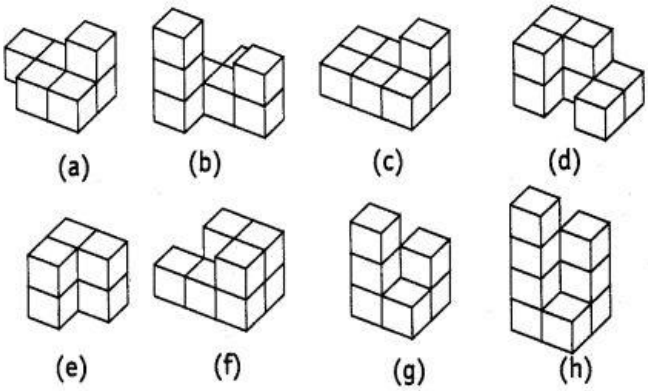
Solution:

The net of such rectangular pyramid will be



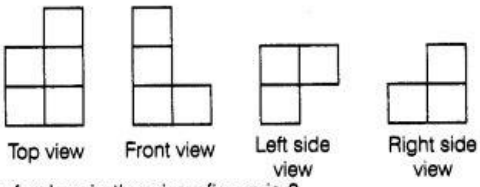
Question 113:

Find the number of cubes in each of the following figures and in each case give the top, front, left side and right side view (arrow indicating the front view).

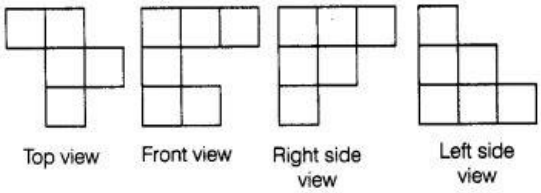


Solution:

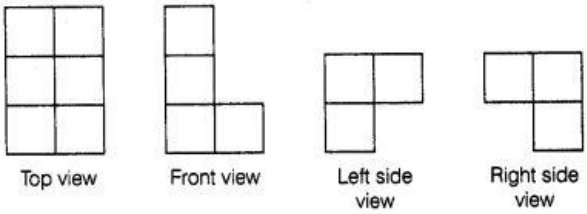
(a) The number of cubes in the given figure is 6.
For given figure,



(b) The number of cubes in the given figure is 8.
For given figure,



(c) The number of cubes in the given figure is 7.
For given figure,



Question 114:

Draw all lines of symmetry for each of the following figures as given below.

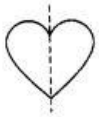
(a) 

(b) 

(c) 

Solution:

(a)

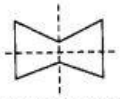


1 line of symmetry

(b) 

No line of symmetry

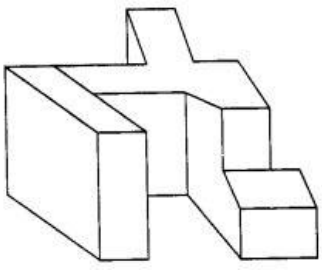
(c)



2 lines of symmetry

Question 115:

How many faces does figure have?



Solution:

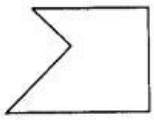
There are total 16 faces in the given figure.

Question 116:

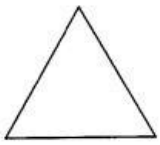
Trace each figure. Then draw all lines of symmetry, if it has.

(a)

(b)

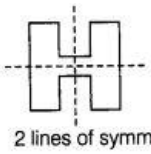


(c)



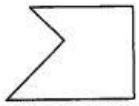
Solution:

(a)



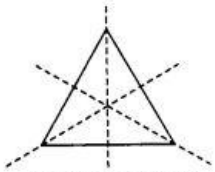
2 lines of symmetry

(b)



No line of symmetry

(c)

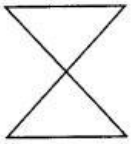


3 lines of symmetry

Question 117:

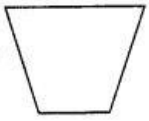
Tell whether each figure has rotational symmetry or not.

(a)

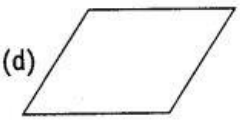


(b)

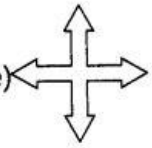
(c)



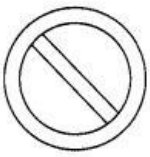
(d)



(e)



(f)



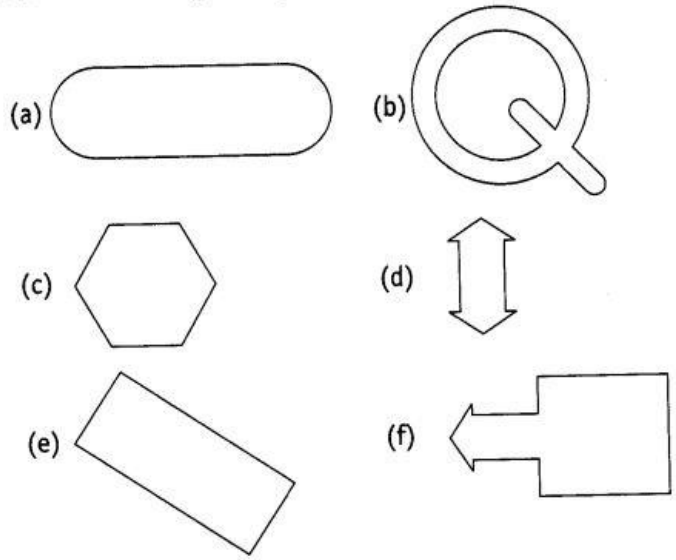
Solution:

(a) Yes **(c)** Yes **(e)** Yes

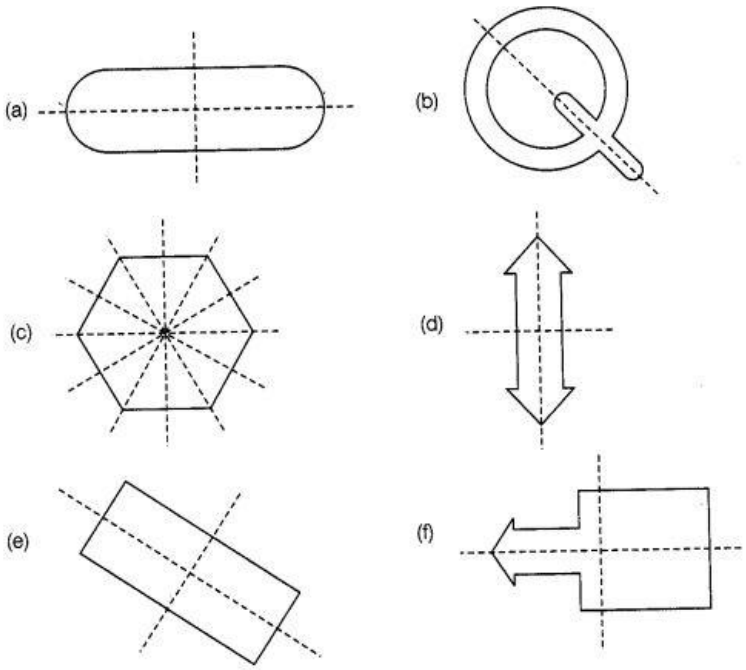
(b) No **(d)** Yes **(f)** Yes

Question 118:

Draw all lines of symmetry of each of the following figure?

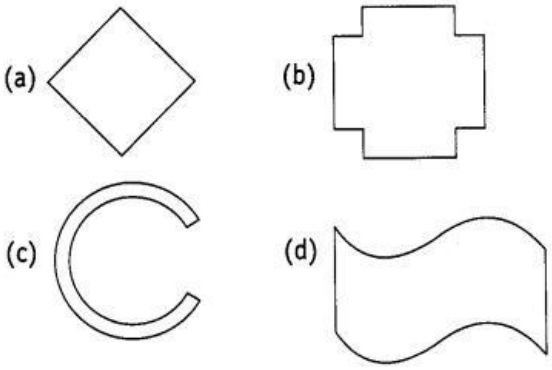


Solution:



Question 119:

Tell whether each figure has rotational symmetry. Write yes or no.



Solution:

(a) Yes **(b)** Yes

(c) No **(d)** Yes

Question 120:

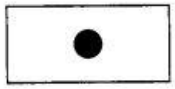
Does the figure has rotational symemetry?

Solution:

The given figure does not show rotational symmetry because one part of design is undarken, whereas other three part are darken. Hence, the design does not show symmetry.

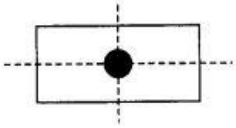
Question 121:

The flag of Japan is shown below. How many lines of symmetry does the flag have?



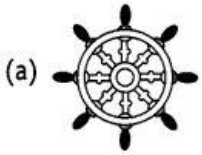
Solution:

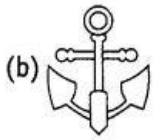
The given flag has 2 lines of symmetry.

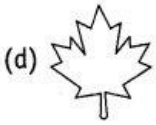


Question 122:

Which of the figures given below have both line and symmetry?

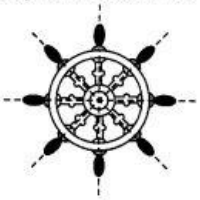




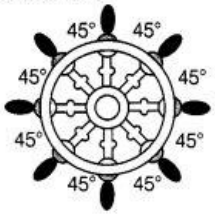


Solution:

Only (a) and (c) have both line and rotational symmetry.
In the given figure, line of symmetry will be shown as



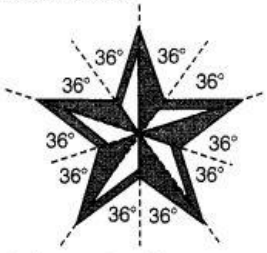
Also, rotational symmetry will be shown as



$\frac{360°}{8}$ = 45°, i.e. rotational angle is equal to 45°.

In the given figure, line of symmetry will be shown as

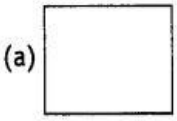
Also, rotational symmetry will be shown as

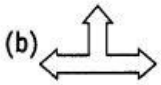


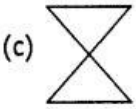
$\frac{360°}{10}$ = 36°, i.e. rotational angle is equal to 36°.

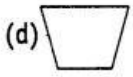
Question 123:

Which of the following figures do not have line symmetry?



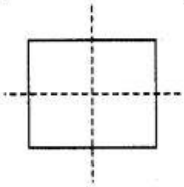






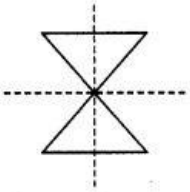
Solution:

(a) We observe that the given figure has 2 lines of symmetry.



(b) The given figure has no line of symmetry.

(c) We observe that the given figure has 2 lines of symmetry.



(d) The given figure has no line of symmetry.

Question 124:

Which capital letters of English alphabet have no line of symmetry?

Solution:

The letters F, G, J, L, N, R Q, R, S and Z have no line of symmetry.