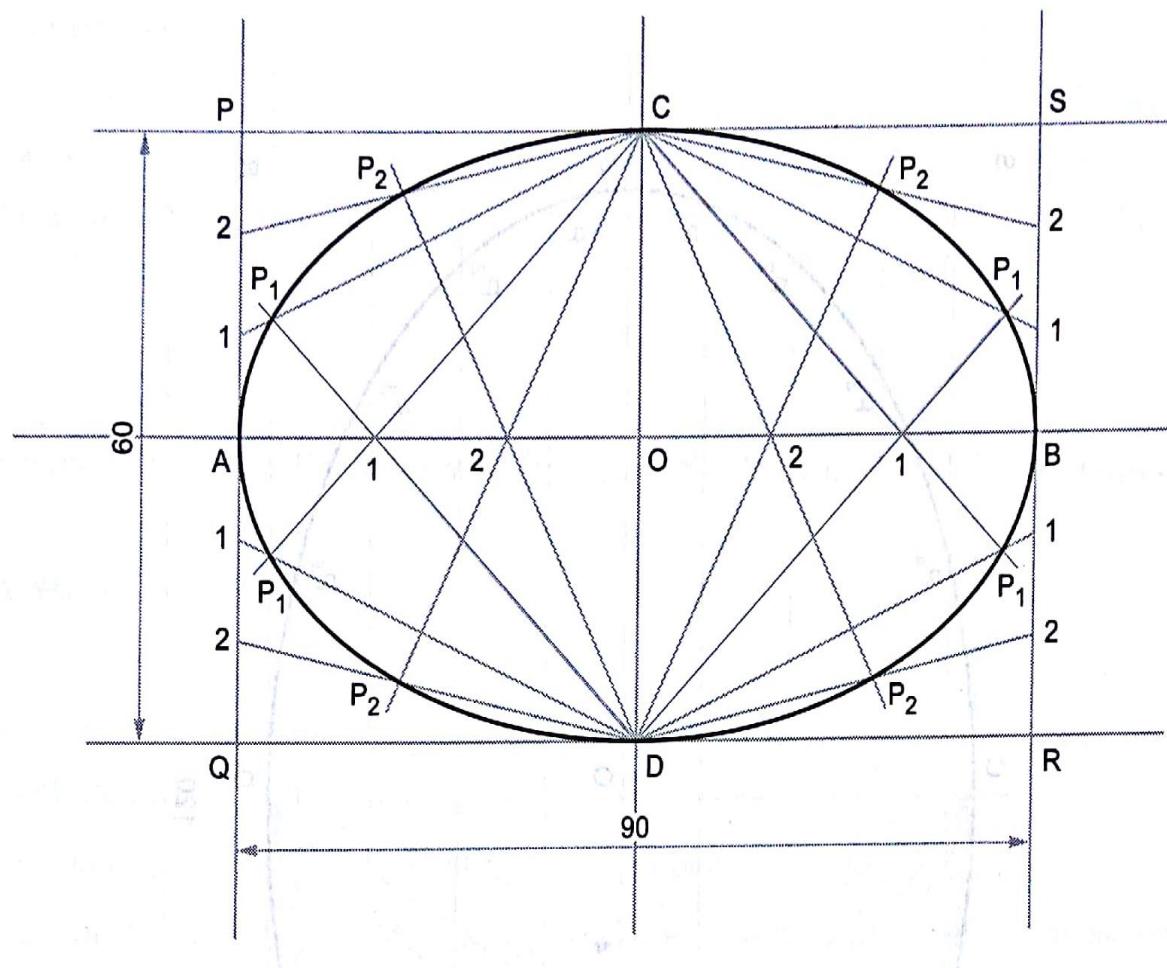


ELLIPSE BY RECTANGLE METHOD

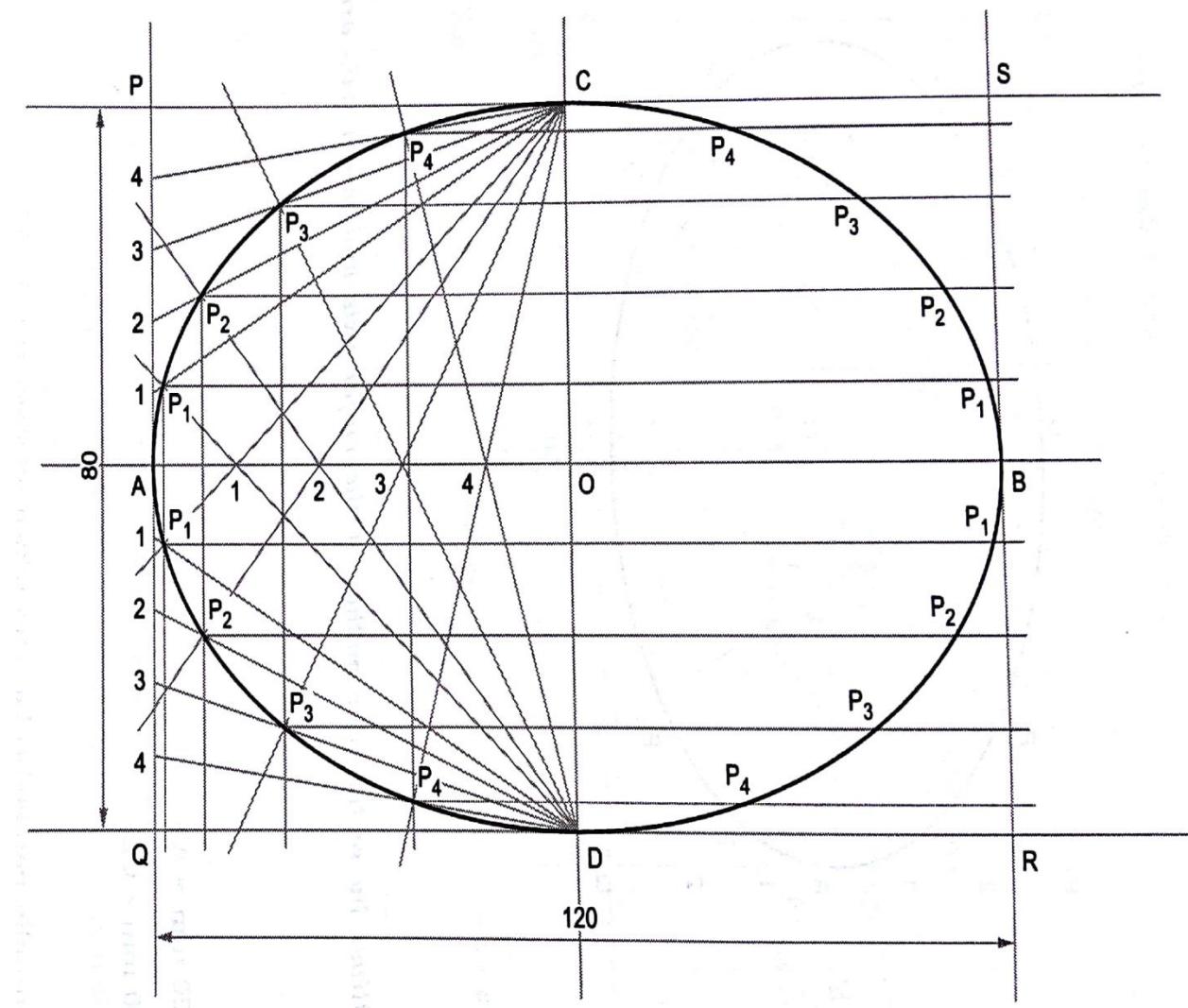
Prob No. 01: Draw an ellipse by rectangle method if the major axis & Minor axis are 90mm & 60 mm respectively.

Solution:



Prob No. 02: Draw an ellipse by rectangle method if the major axis & Minor axis are 120 mm & 80 mm respectively.

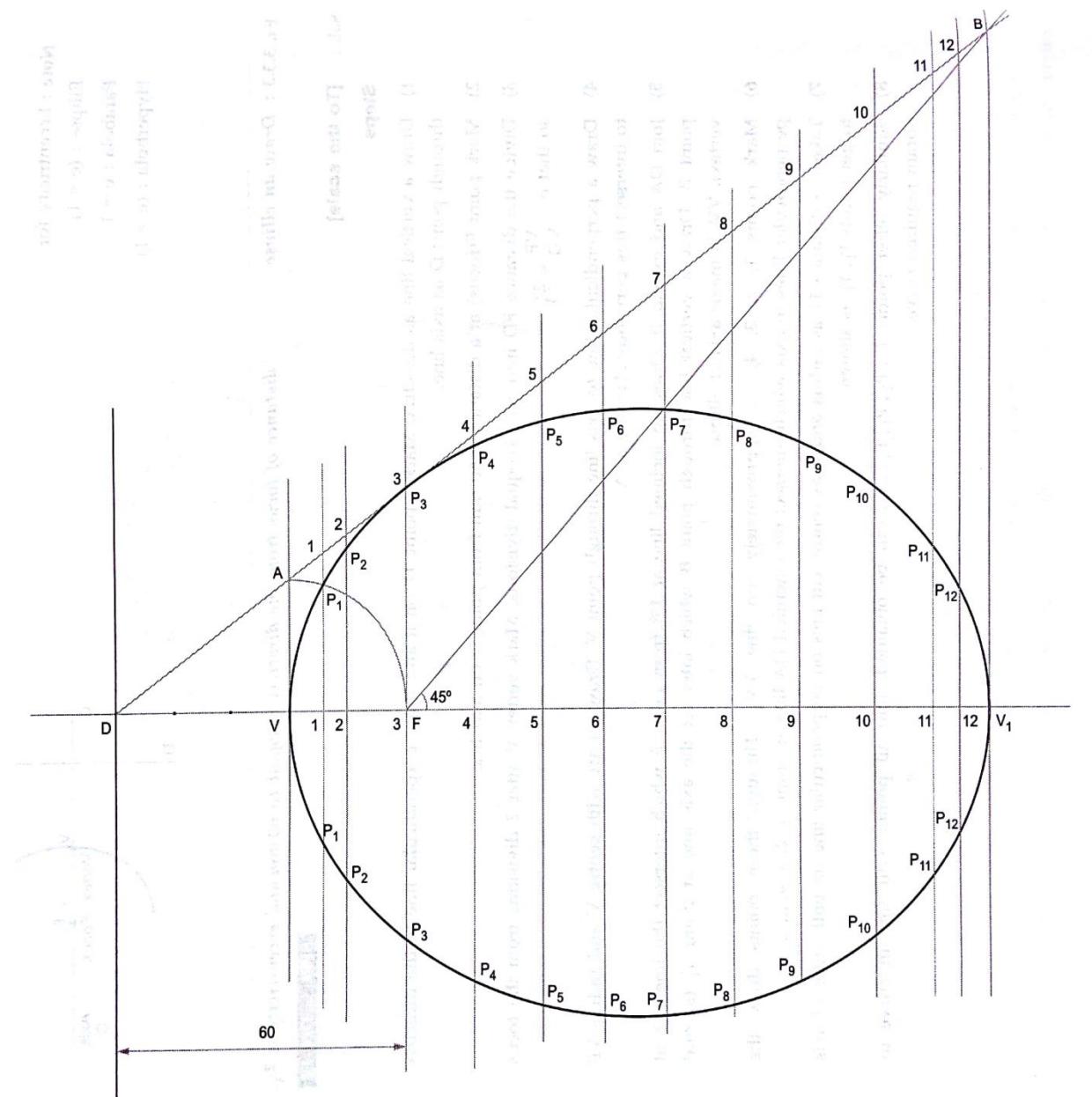
Solution:



ELLIPSE BY DIRECTRIX FOCUS METHOD

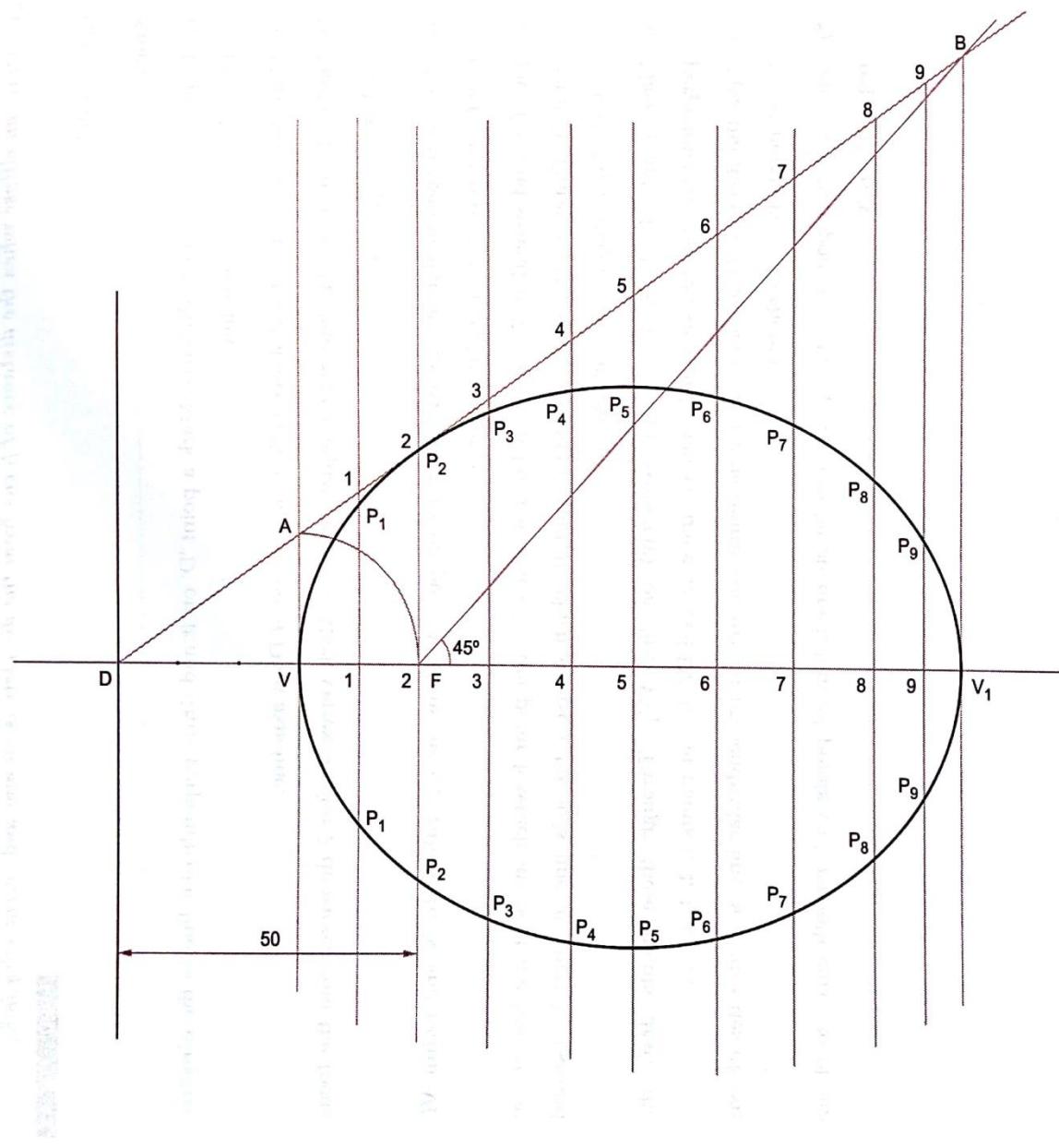
Prob No. 03: Draw an ellipse by directrix focus method if distance of focus point from directrix is 60 mm & eccentricity is 2/3.

Solution:



Prob No. 04: Draw an ellipse by directrix focus method if distance of focus point from directrix is 50 mm & eccentricity is $2/3$.

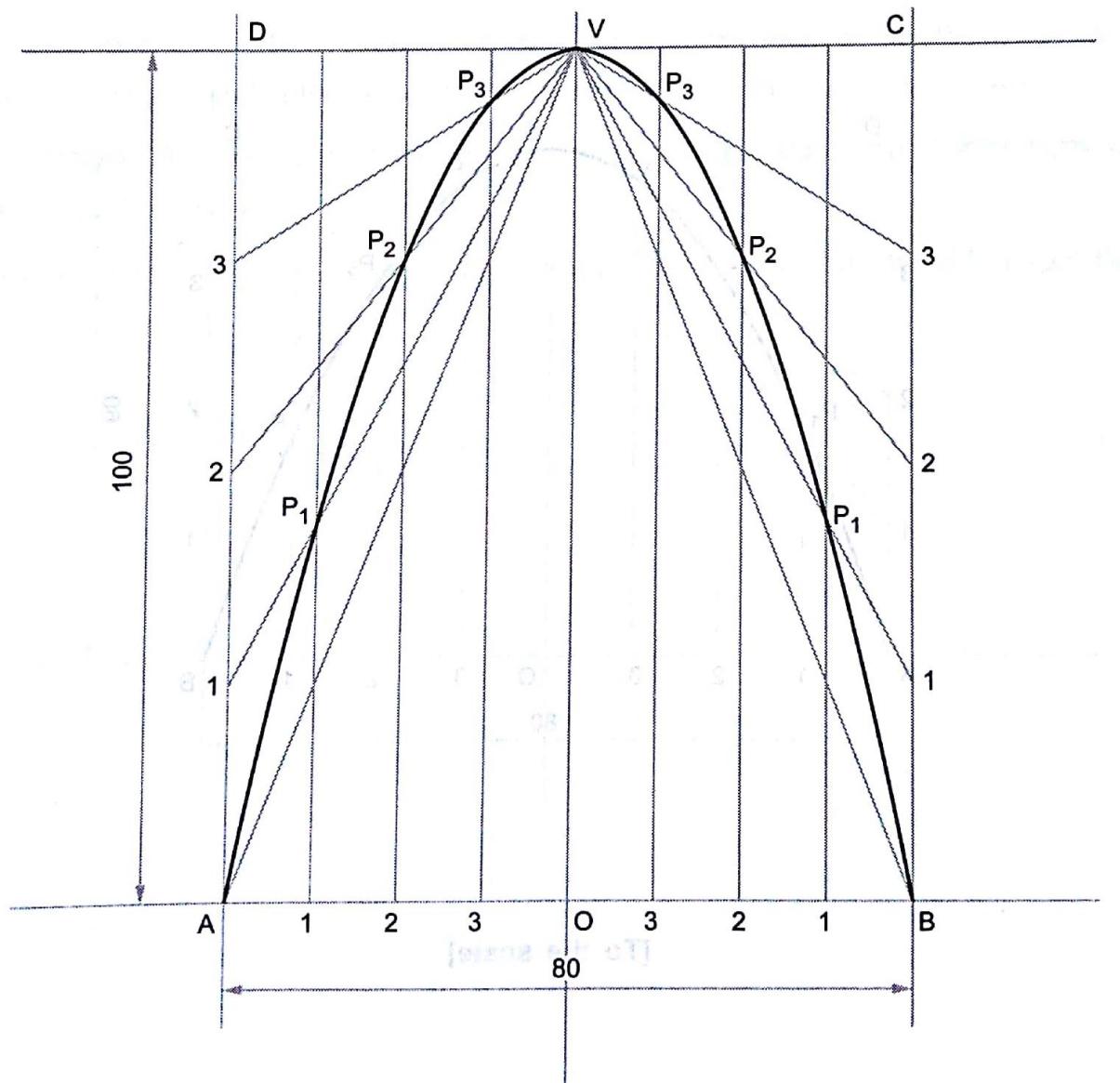
Solution:



PARABOLA BY RECTANGLE METHOD

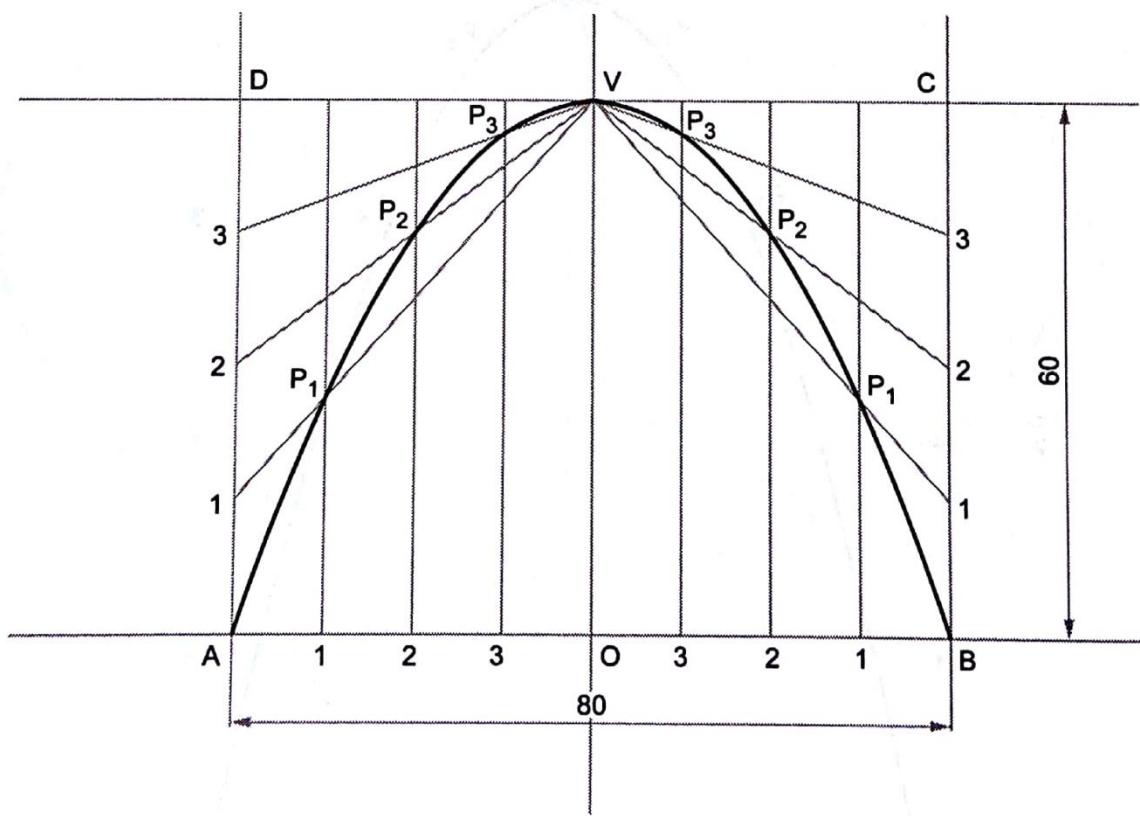
Prob No. 05: Draw a parabola by rectangle method if the base is 80 mm and axis height is 100 mm.

Solution:



Prob No. 06: Draw a parabola by rectangle method if the base is 80 mm and axis height is 60 mm.

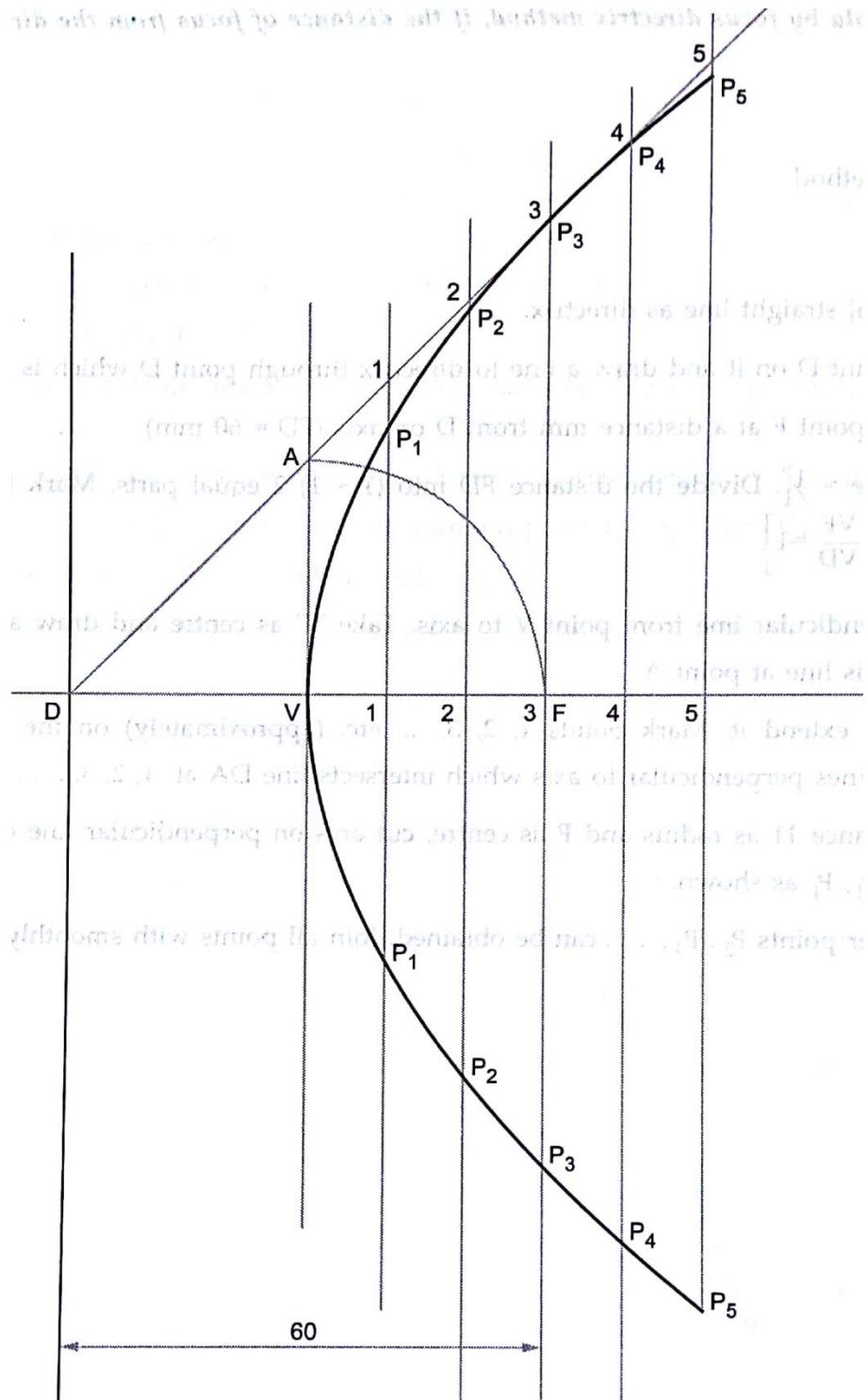
Solution:



PARABOLA BY DIRECTRIX FOCUS METHOD

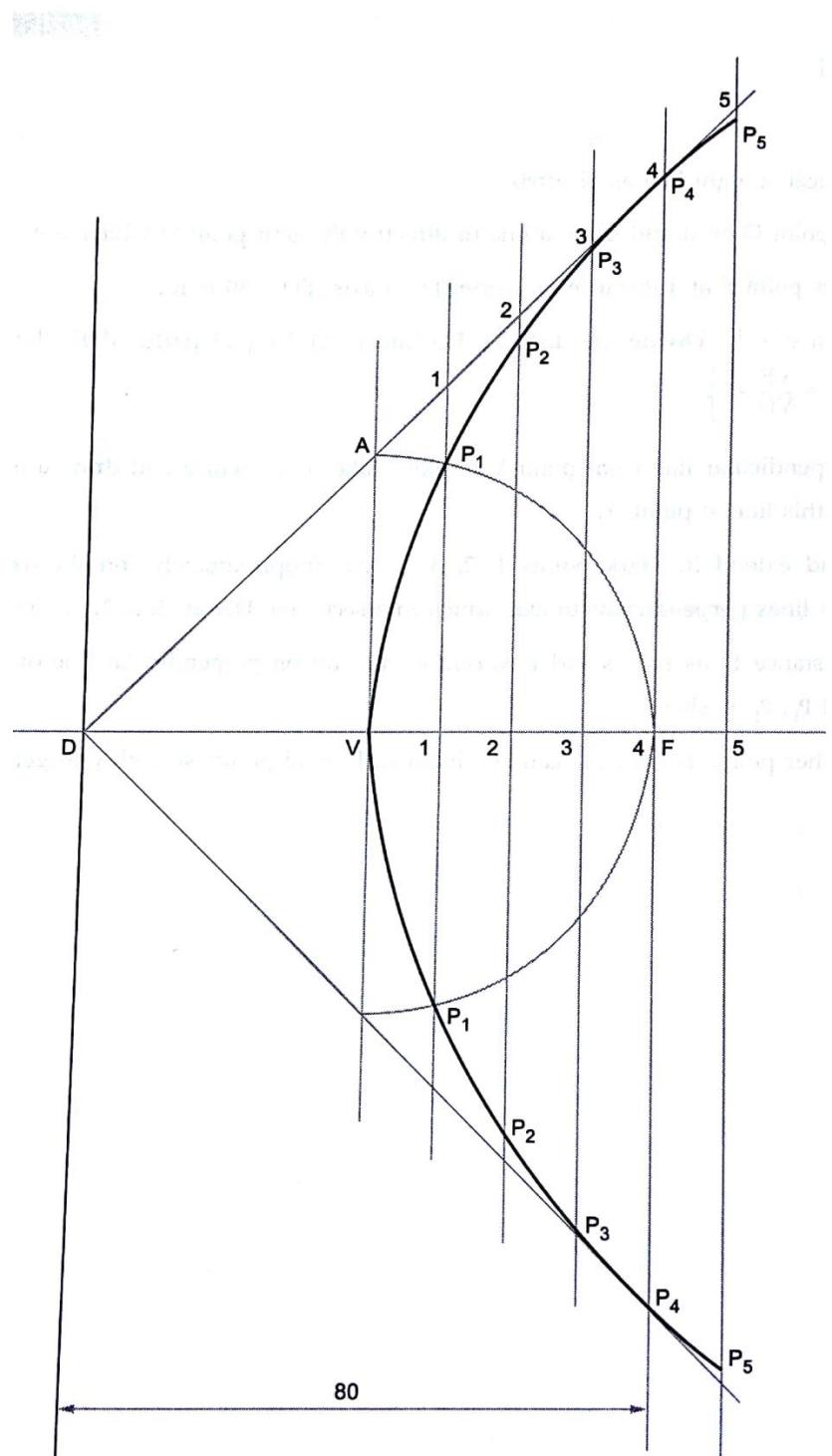
Prob No. 07: Draw a parabola if distance of focus point from the directrix is 60 mm.

Solution:



Prob No. 08: Draw a parabola if distance of focus point from the directrix is 80 mm.

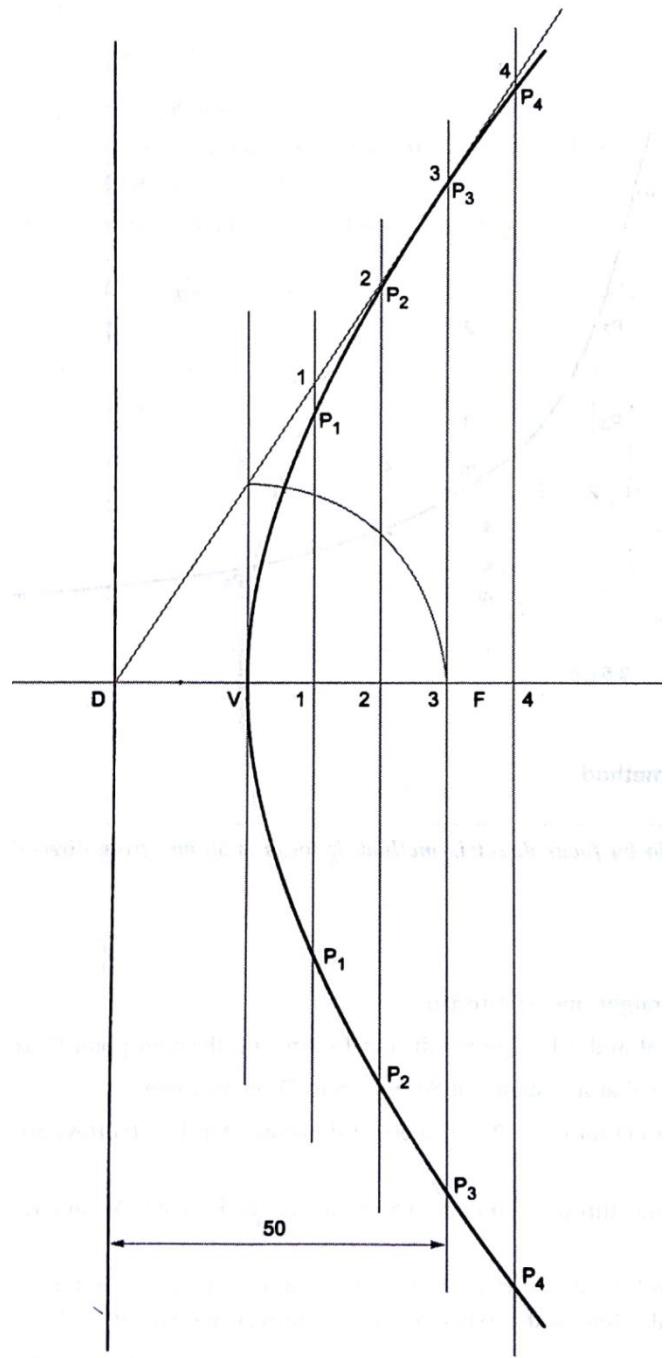
Solution:



HYPERBOLA BY DIRECTRIX FOCUS METHOD

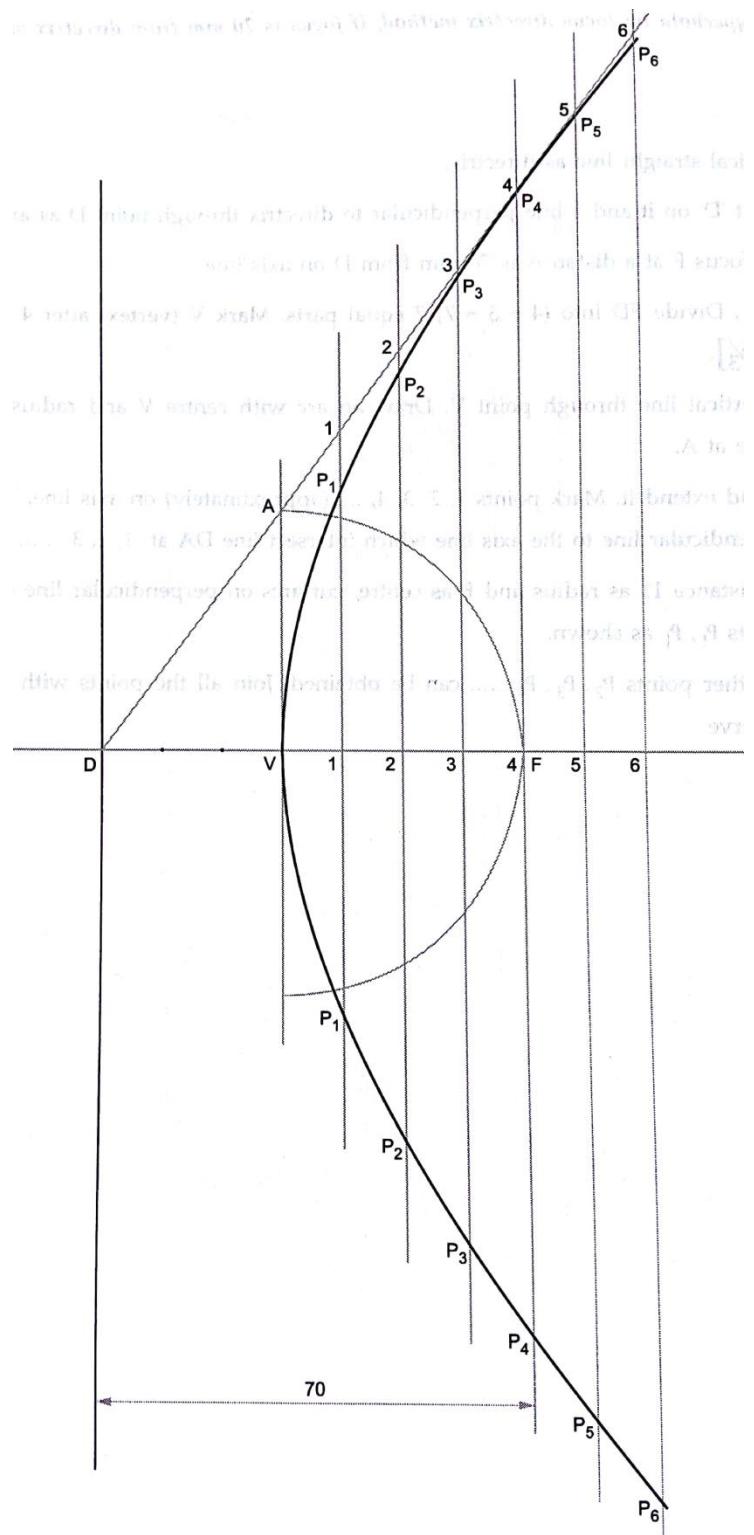
Prob No. 09: Draw a Hyperbola if distance of focus point from the directrix is 50 mm & $e=3/2$.

Solution:



Prob No. 10: Draw a Hyperbola if distance of focus point from the directrix is 70 mm & $e=4/3$.

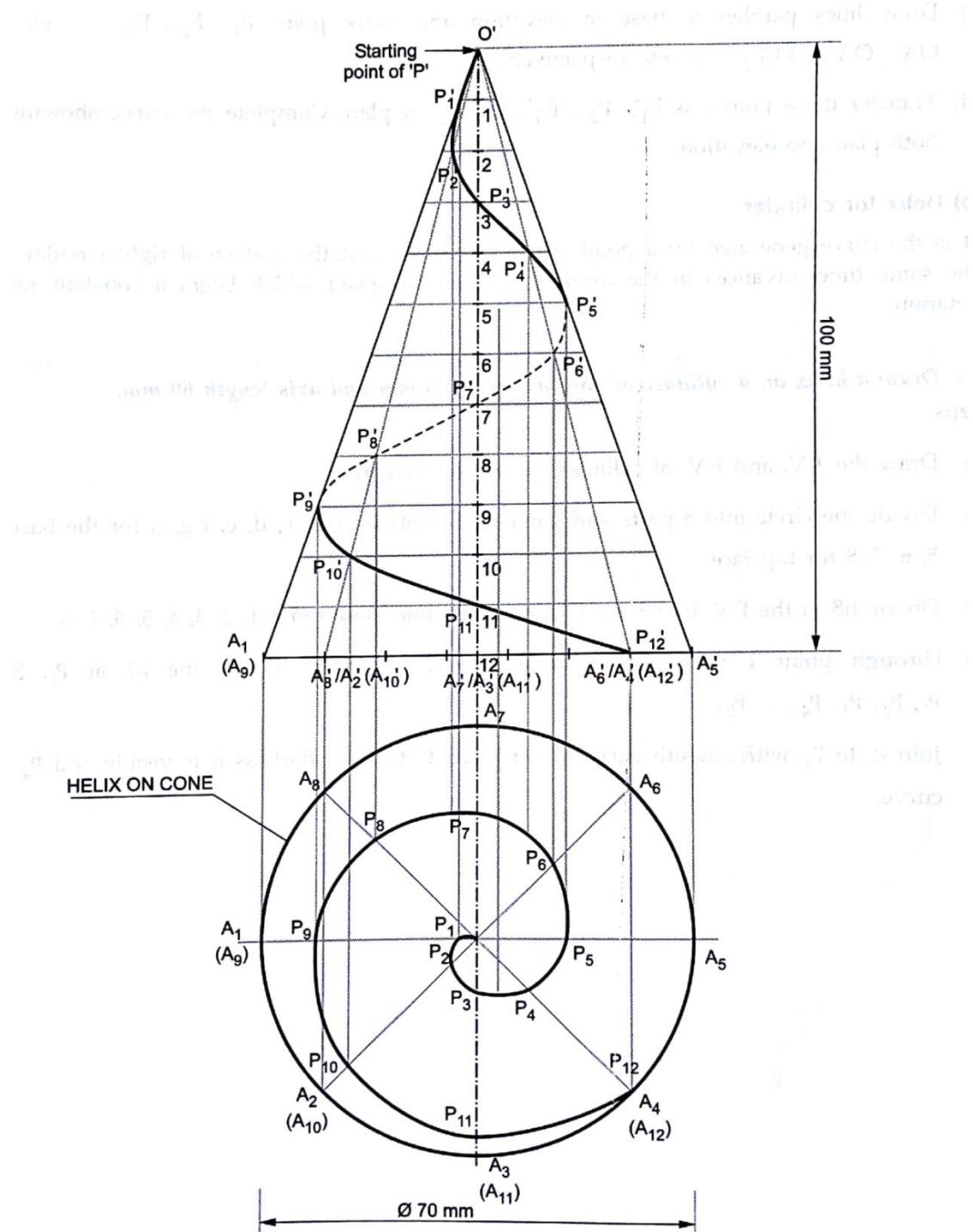
Solution:



HELIX ON CONE

Prob No. 11: A point P is moving around the surface of the cone of base 70 mm & height 100 mm if point P starting from apex and reaches to base in one and half turn. Draw the projection of path P.

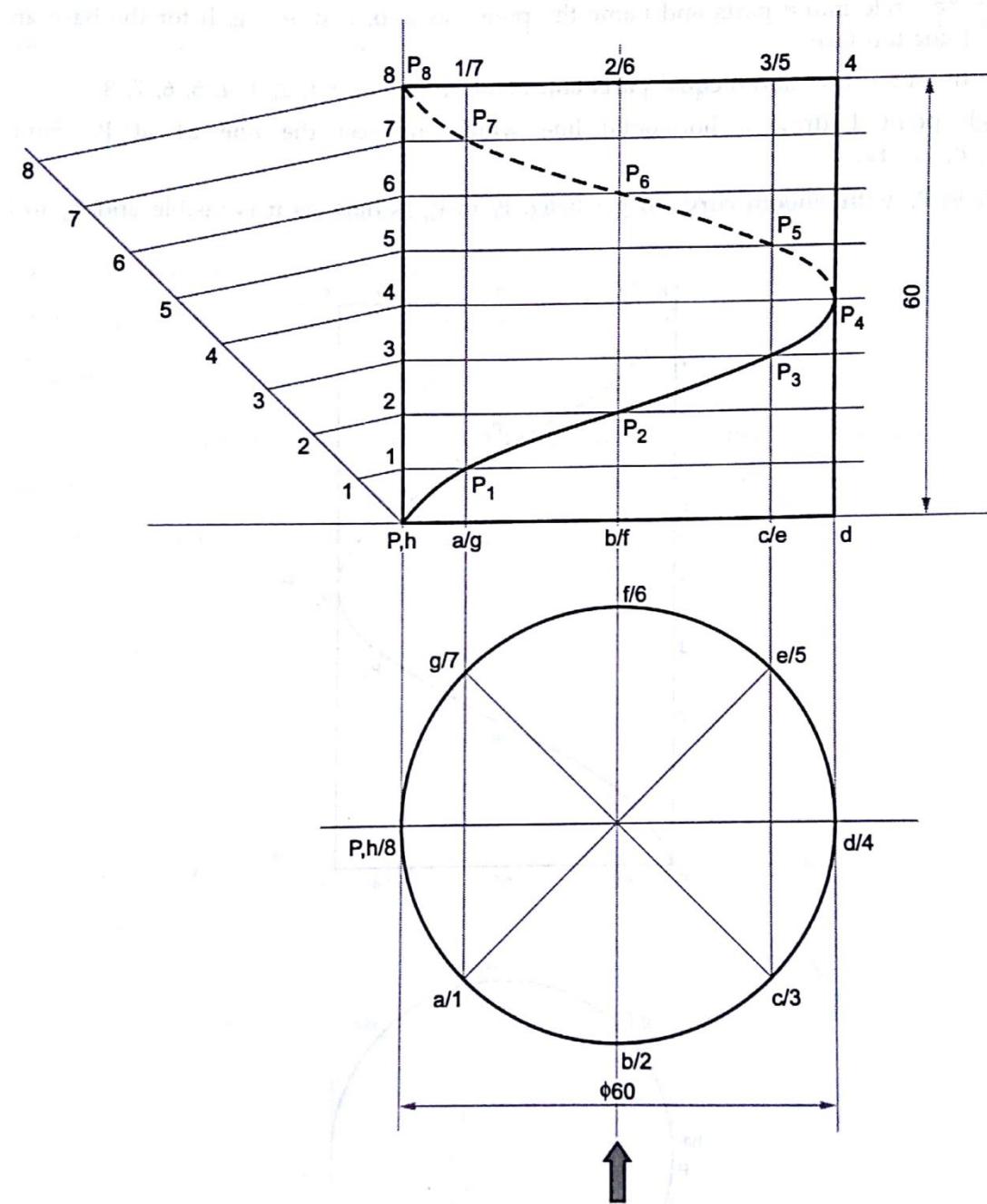
Solution:



HELIX ON CYLINDER

Prob No. 12: Draw helix on cylinder of base 60 mm & height 60 mm .

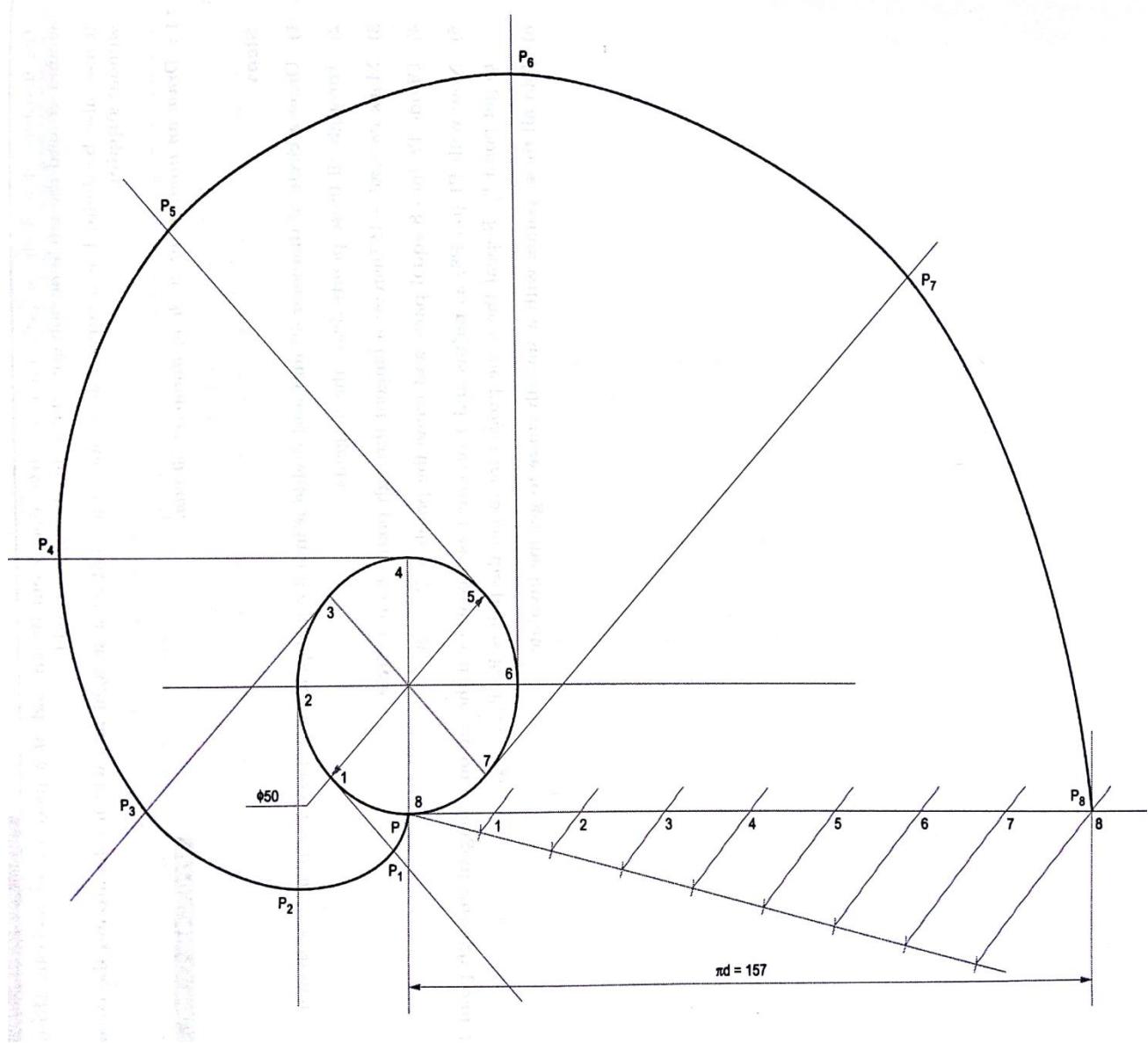
Solution:



INVOLTE

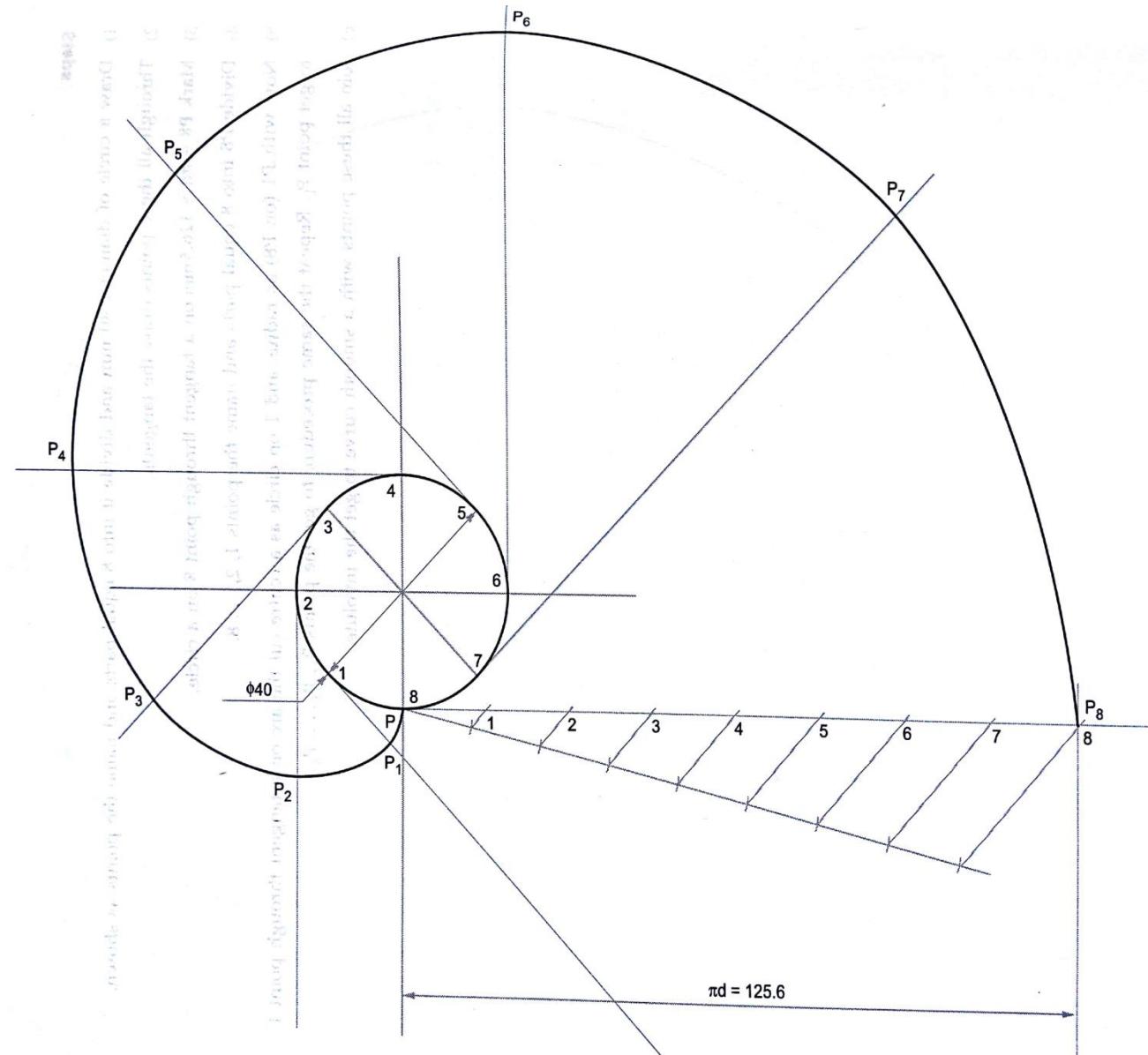
Prob No. 13: Draw involute of circle of diameter 50 mm .

Solution:



Prob No. 14: Draw involute of circle of diameter 40 mm .

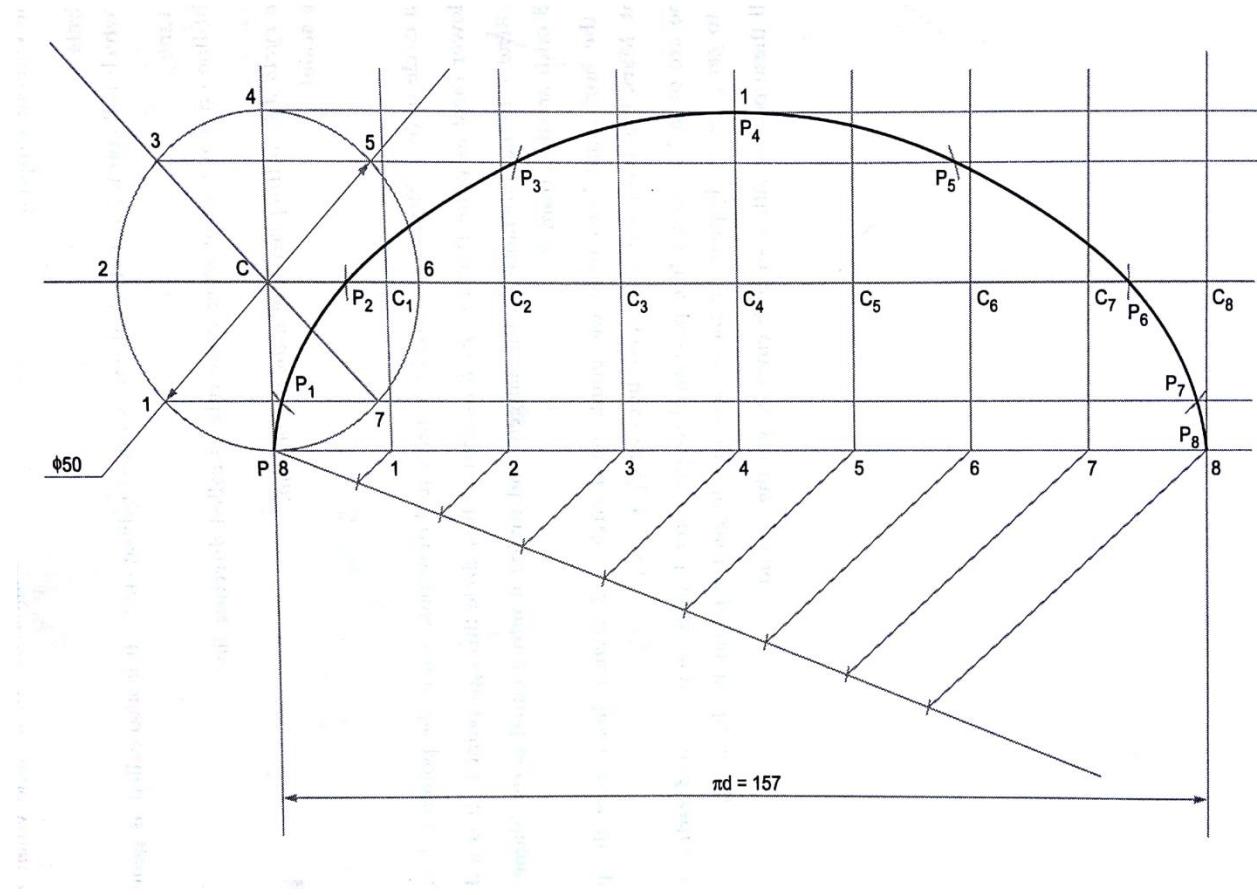
Solution:



CYCLOID

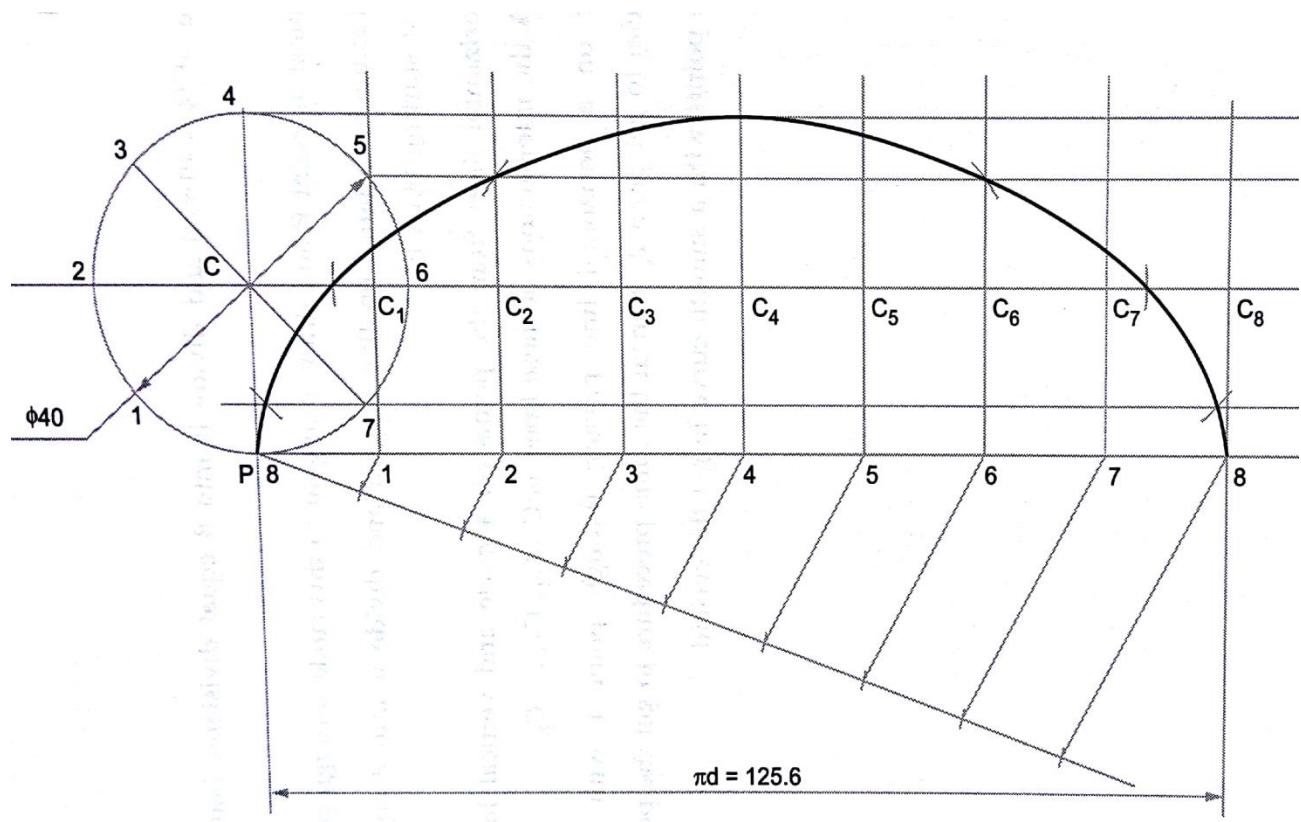
Prob No. 15: Draw cycloid of rolling circle of diameter 50mm. .

Solution:



Prob No. 16: Draw cycloid of rolling circle of diameter 40mm. .

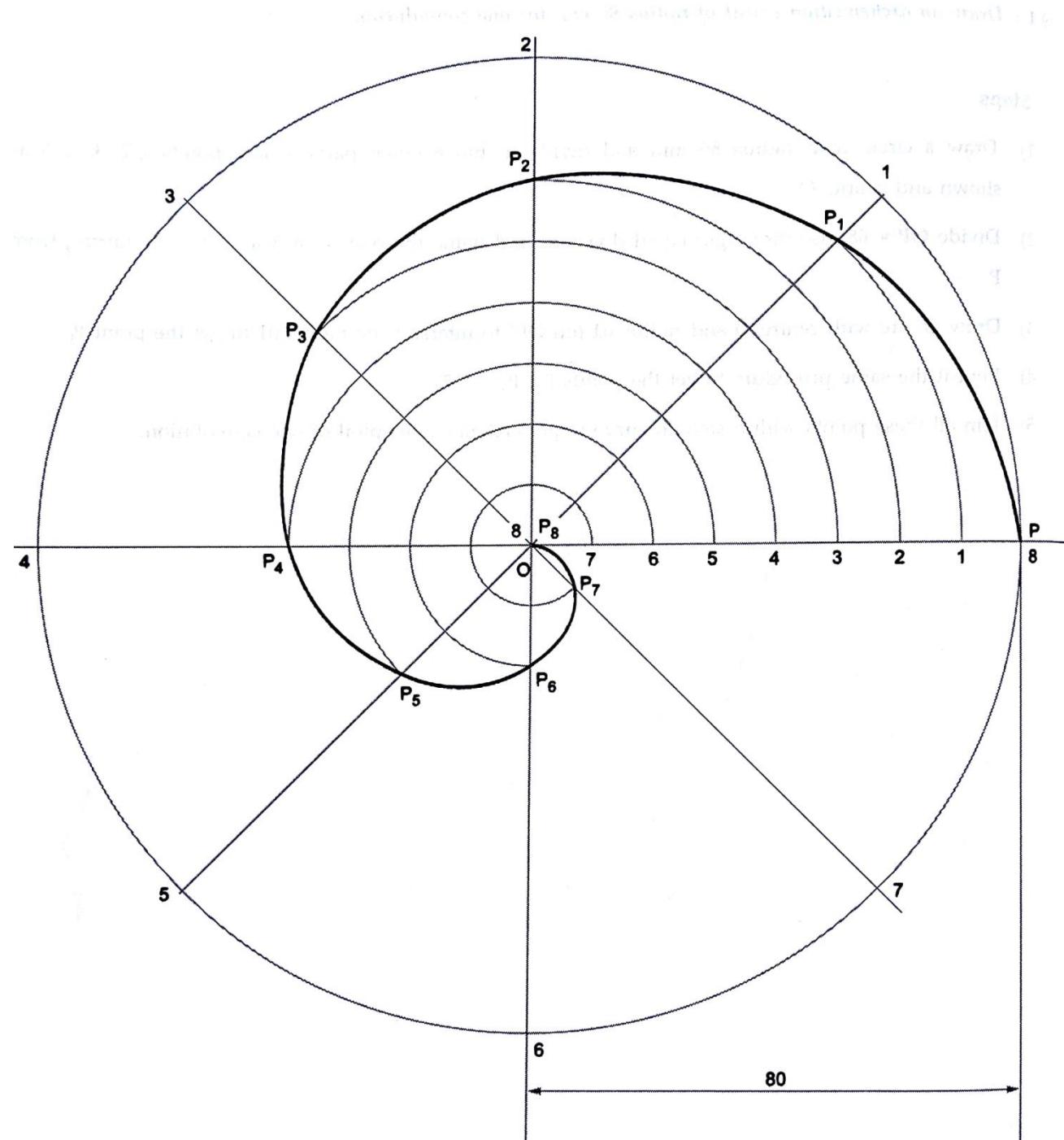
Solution:



ARCHEMEDEAN SPIRAL

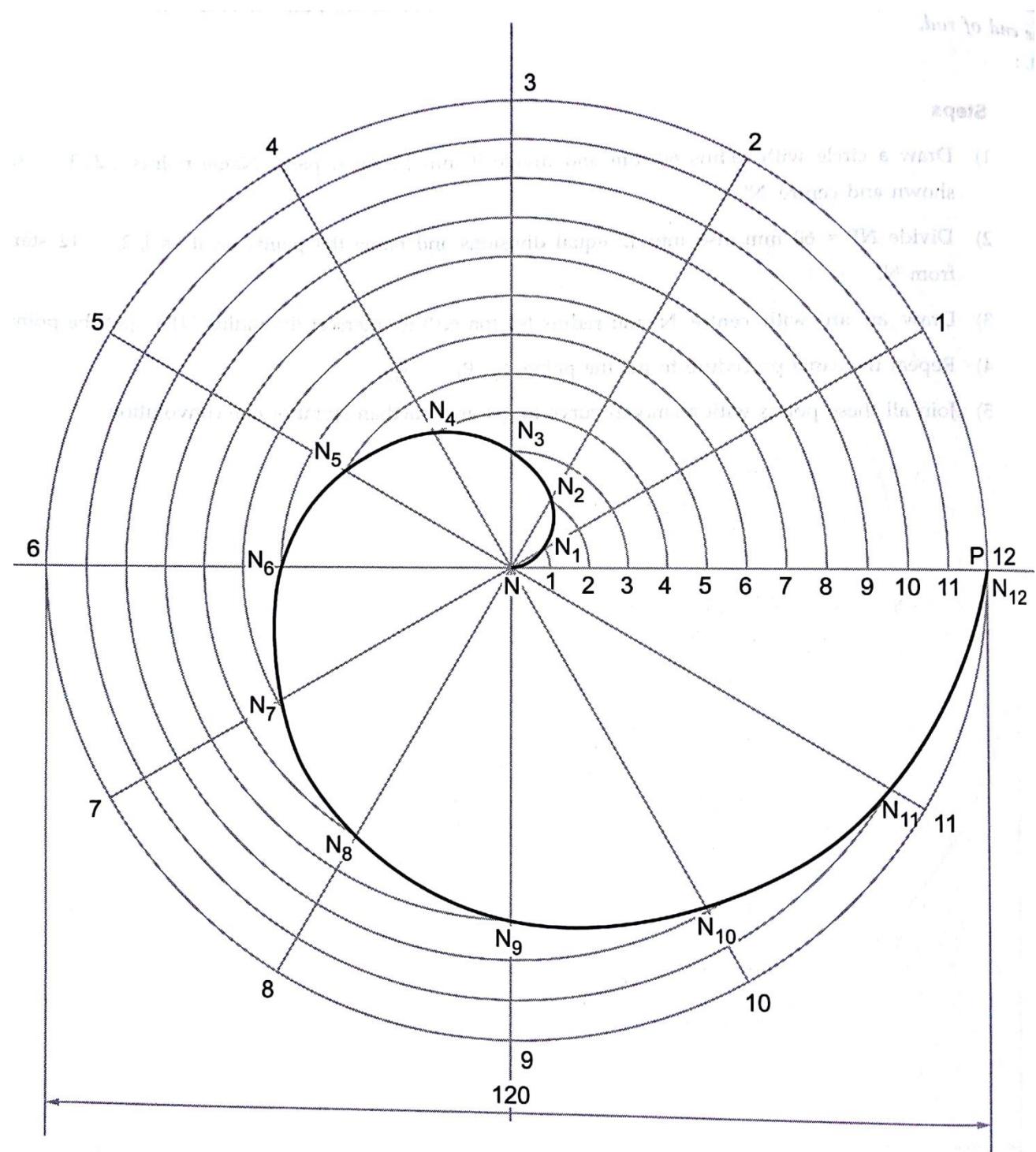
Prob No. 17: Draw archimedean spiral of radius 80 mm for one convolution.

Solution:



Prob No. 18: Draw archedimedean spiral of radius 120 mm for one convolution if point moves from center to end.

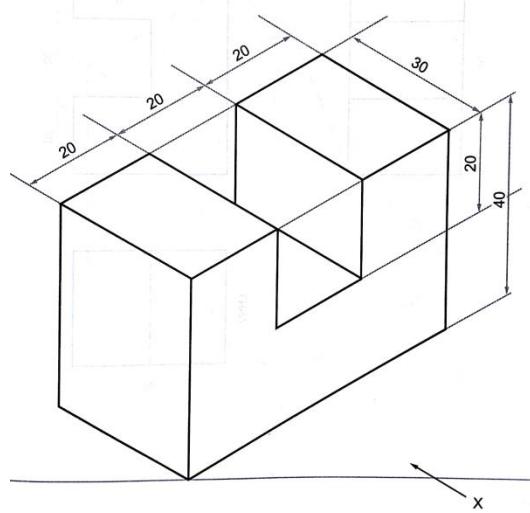
Solution:



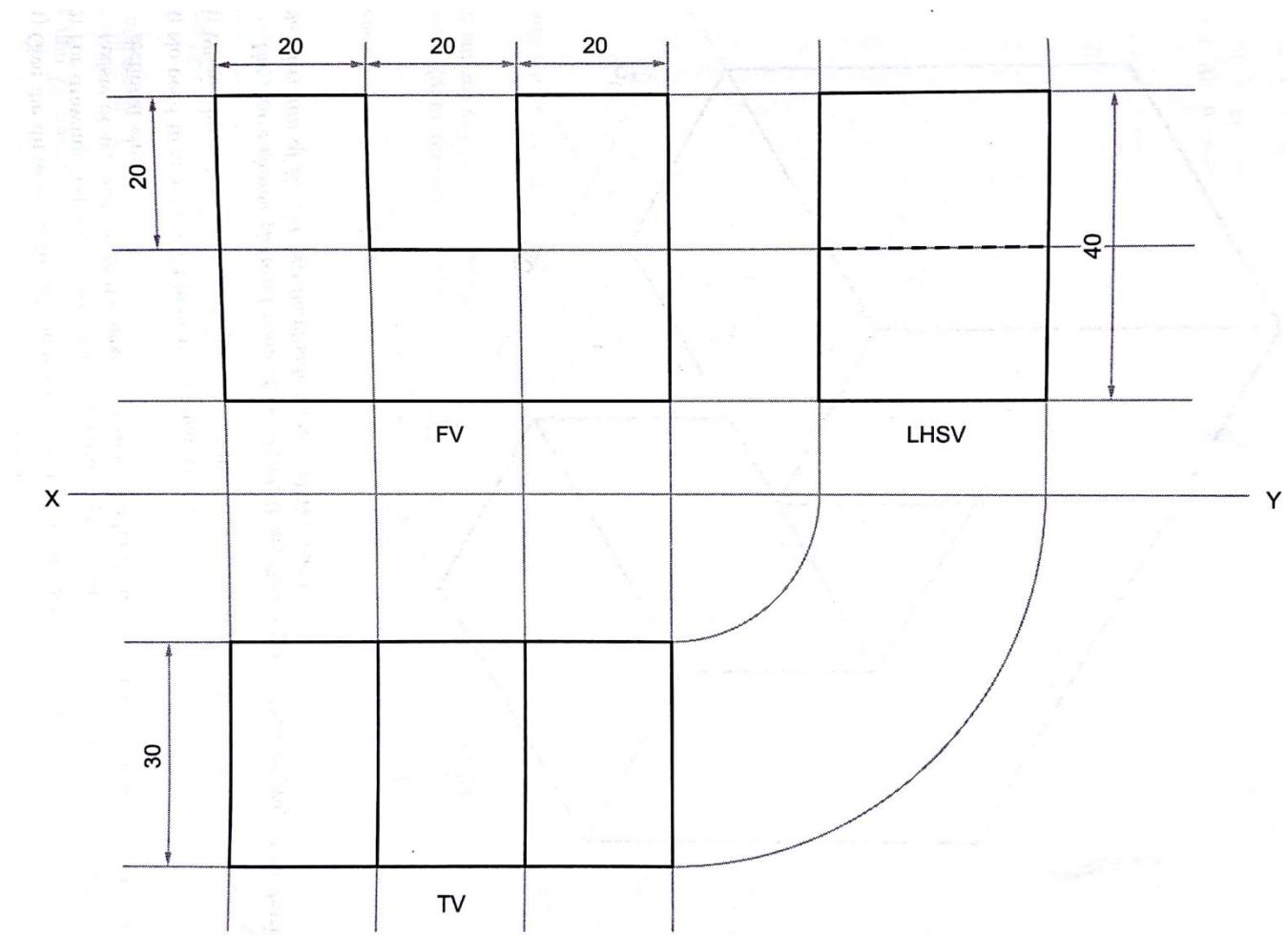
UNIT- IV : Orthographic Projection

Problem 01: Figure shows pictorial view of object using first angle method of projection draw

(i)Front View (ii) Top view & (iii) Side view of the object

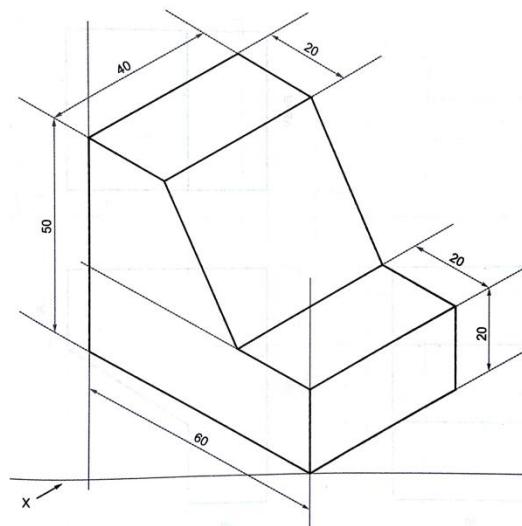


Solution:

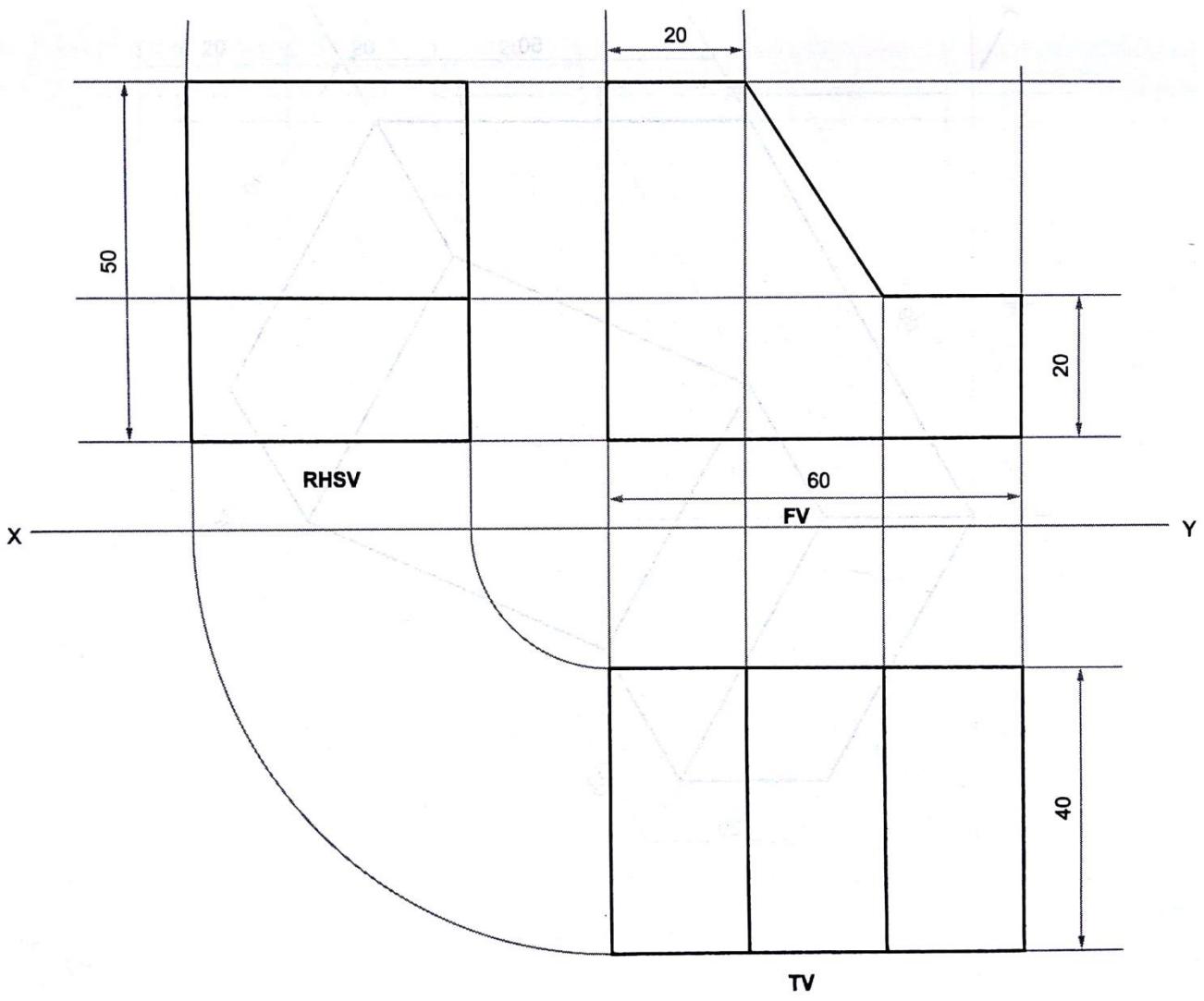


Problem 02: Figure shows pictorial view of object using first angle method of projection draw

- (i)Front View (ii) Top view & (iii) Side view of the object

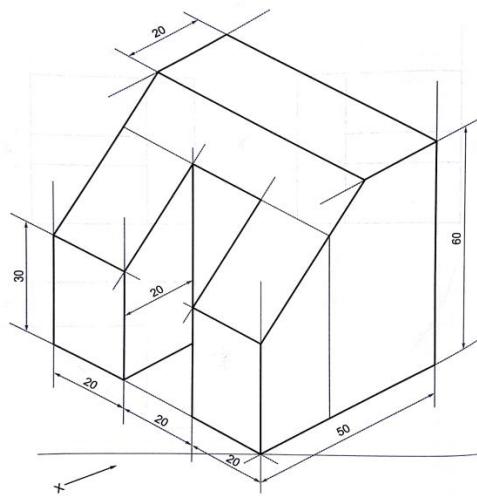


Solution:

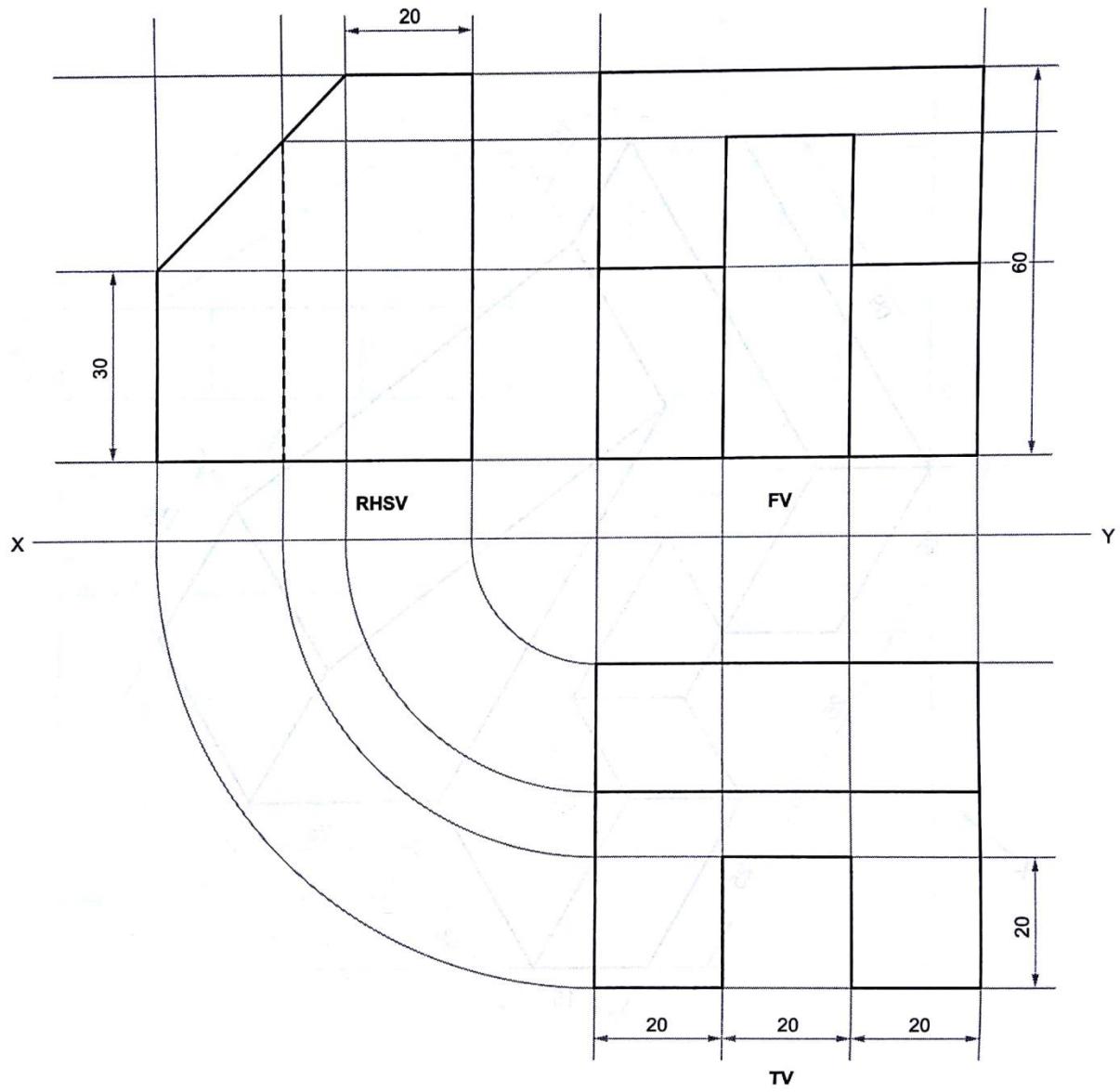


Problem 03: Figure shows pictorial view of object using first angle method of projection draw

(i) Front View (ii) Top view & (iii) Side view of the object

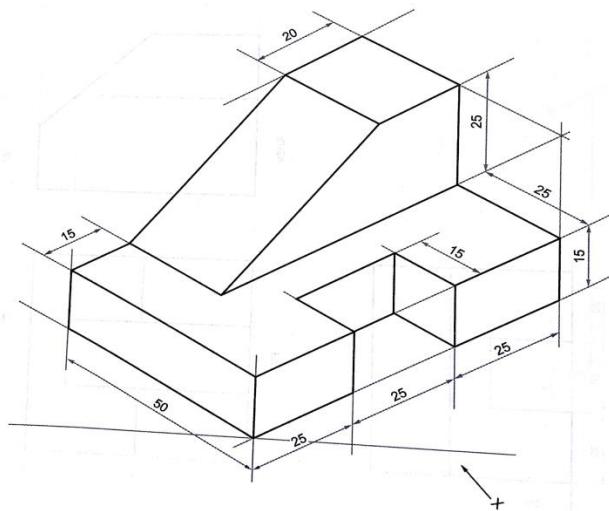


Solution:

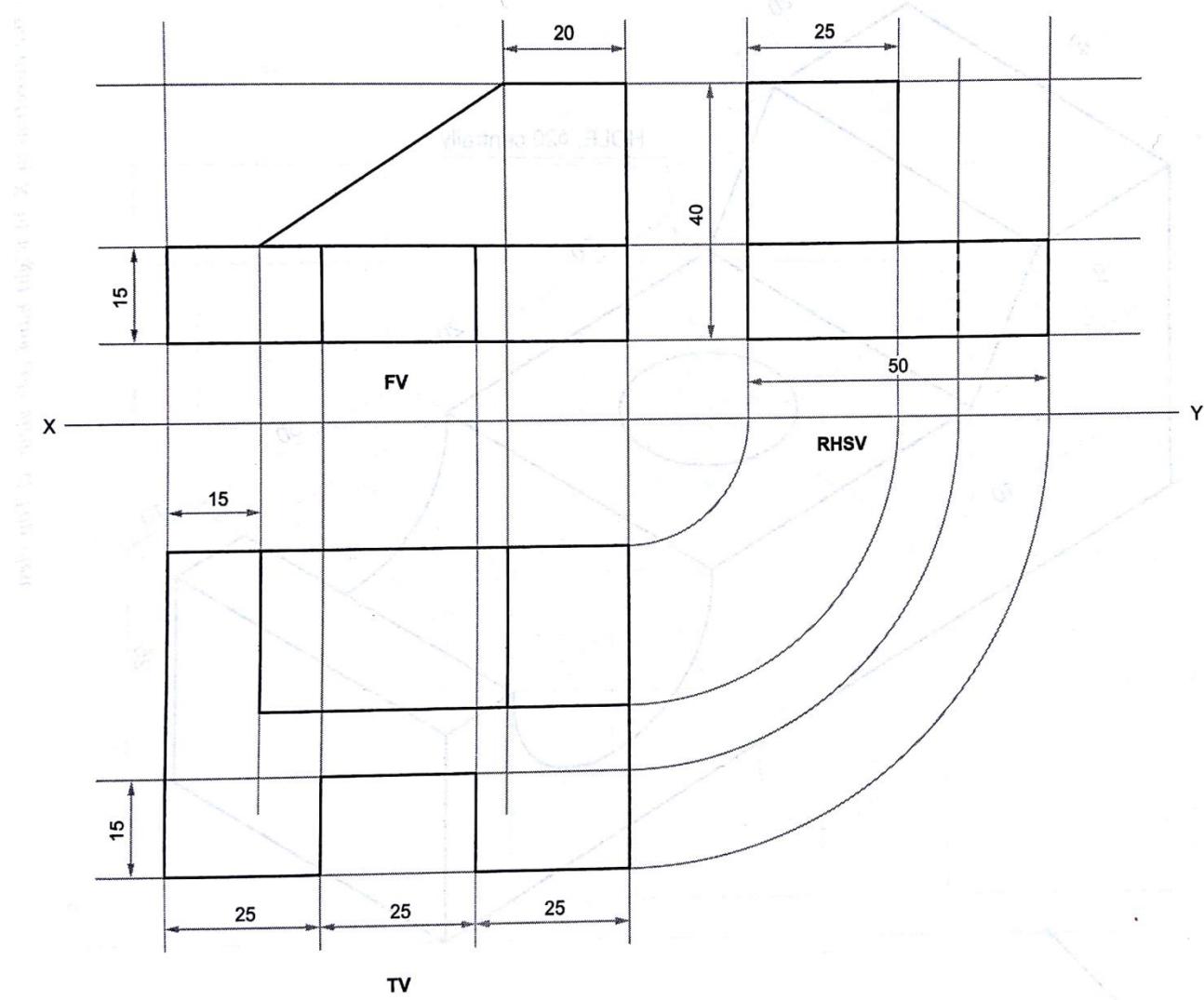


Problem 04: Figure shows pictorial view of object using first angle method of projection draw

- (i) Front View (ii) Top view & (iii) Side view of the object

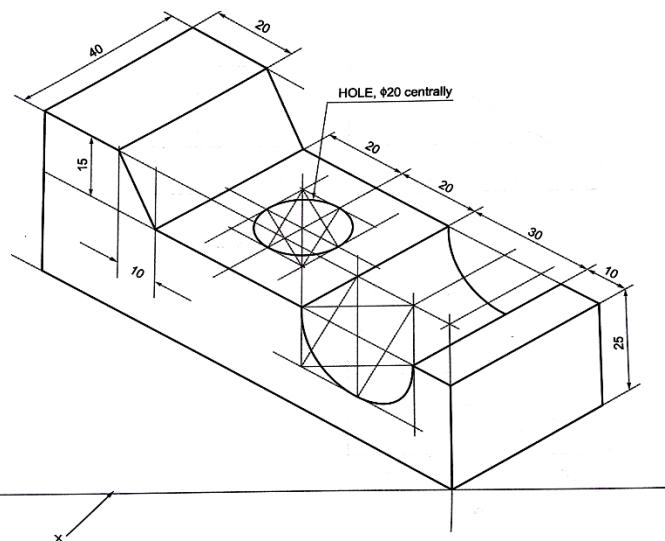


Solution:

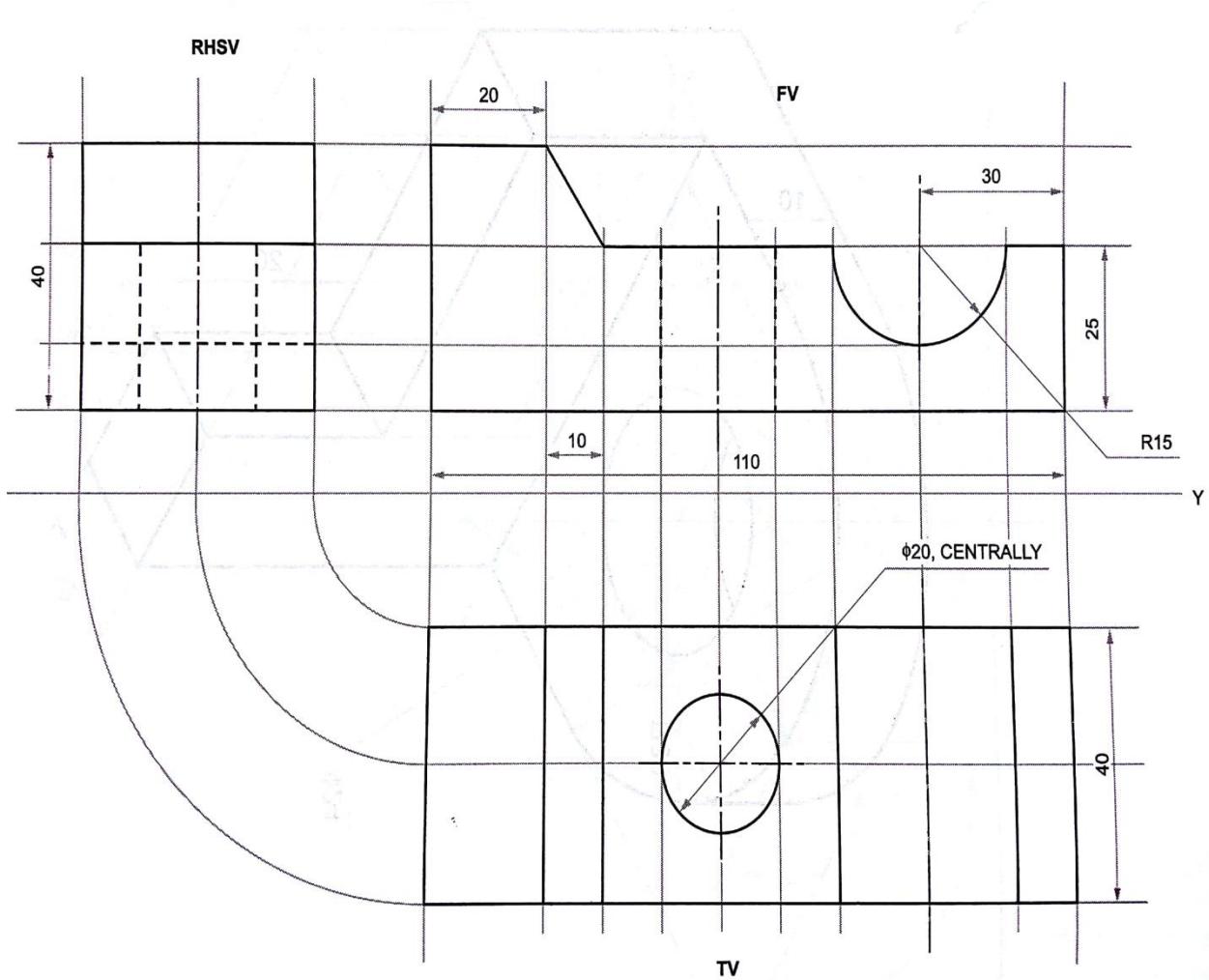


Problem 05: Figure shows pictorial view of object using first angle method of projection draw

(i)Front View (ii) Top view & (iii) Side view of the object

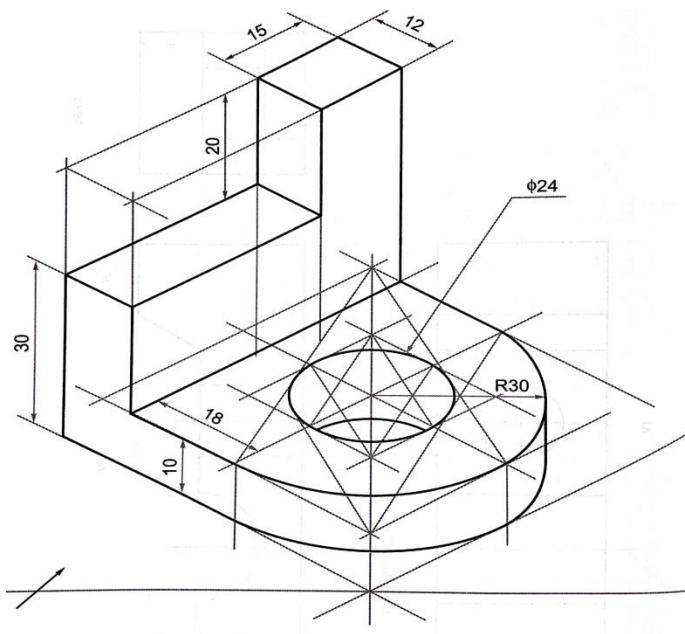


Solution:

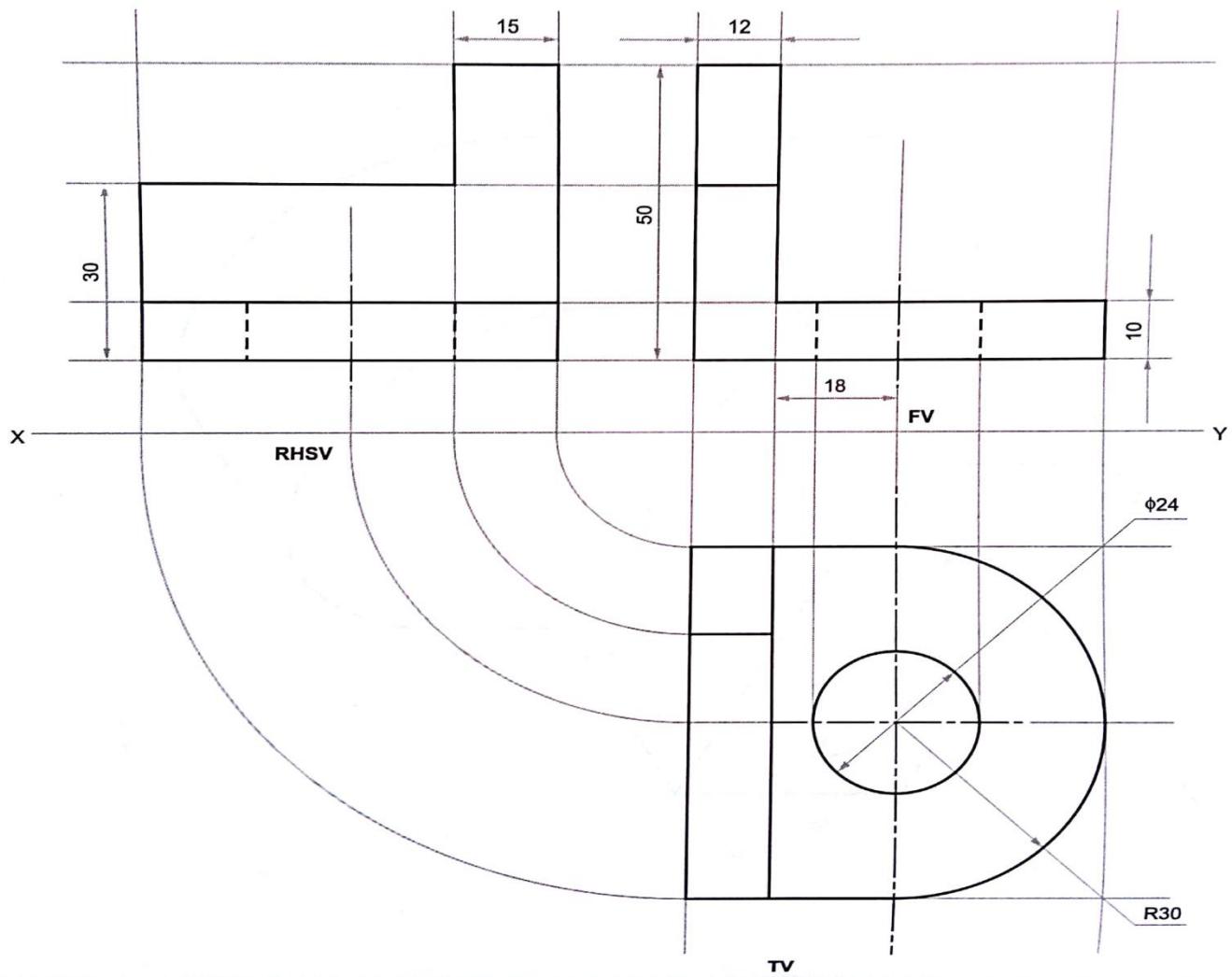


Problem 06: Figure shows pictorial view of object using first angle method of projection draw

(i)Front View (ii) Top view & (iii) Side view of the object

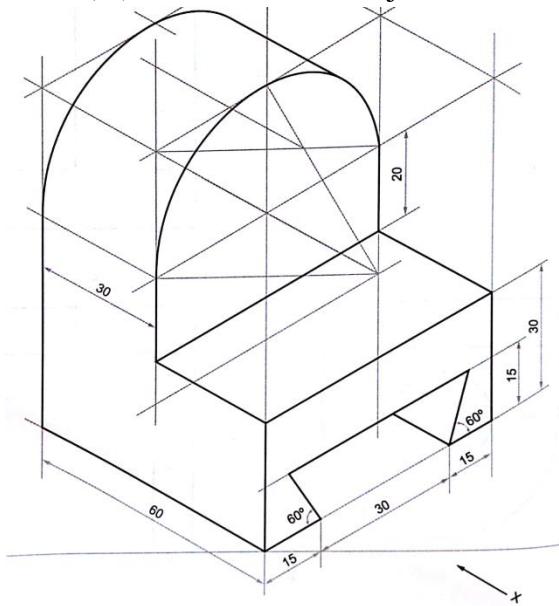


Solution:

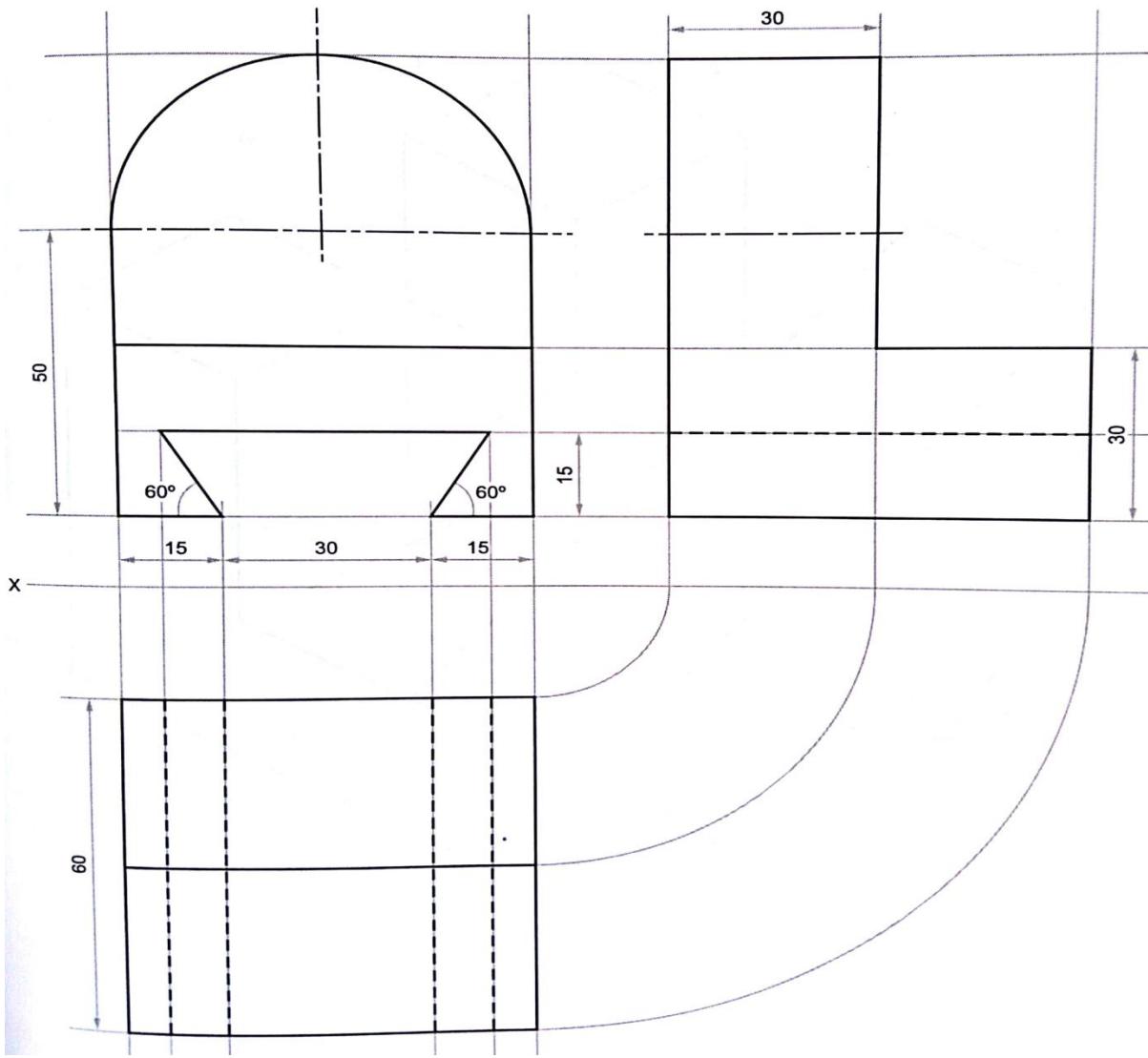


Problem 07: Figure shows pictorial view of object using first angle method of projection draw

(i)Front View (ii) Top view & (iii) Side view of the object

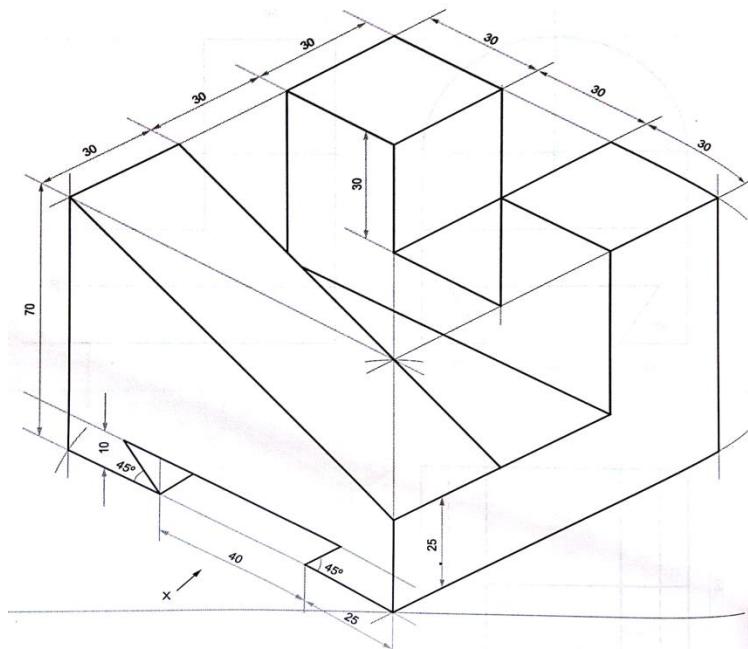


Solution:

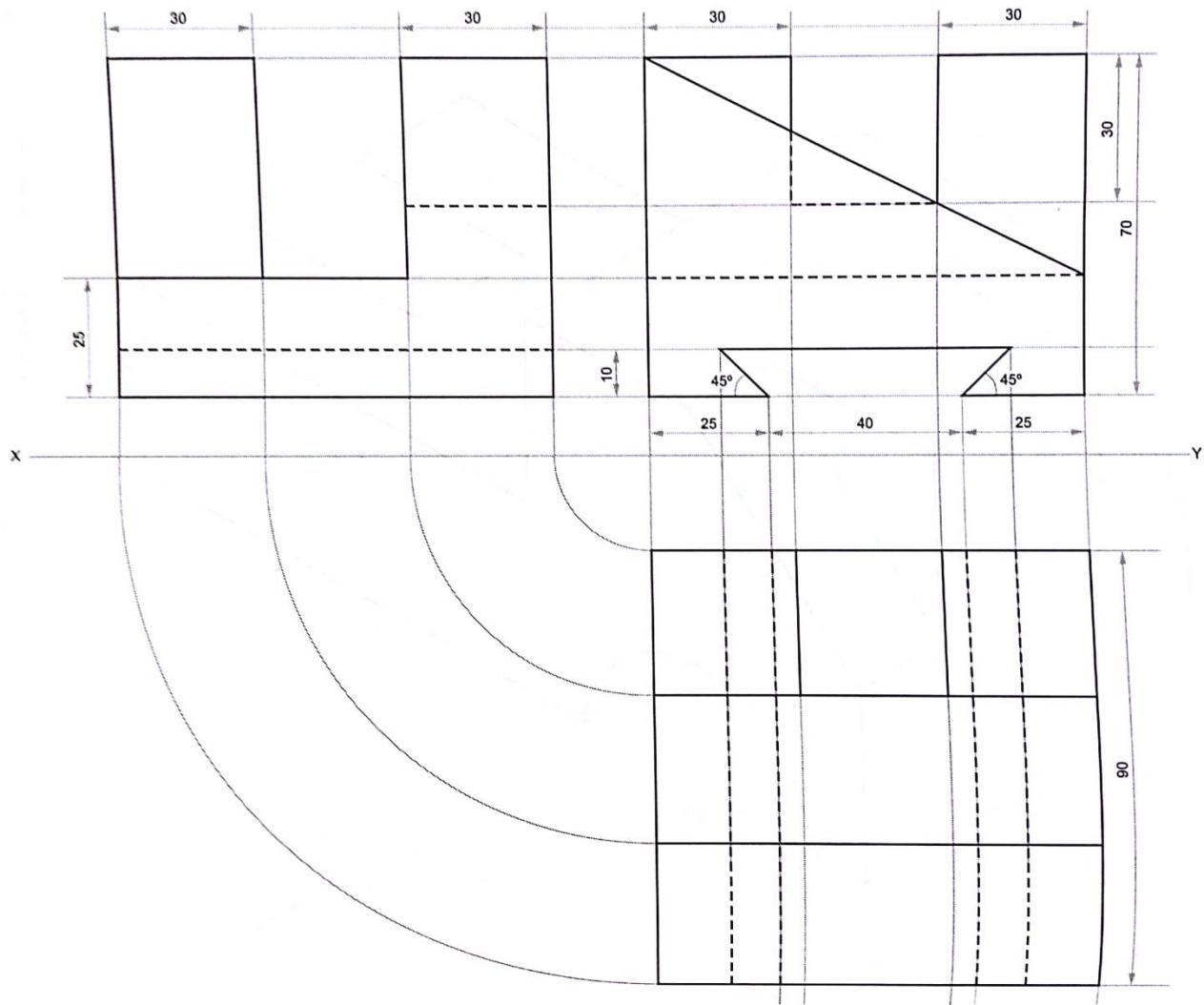


Problem 08: Figure shows pictorial view of object using first angle method of projection draw

(i)Front View (ii) Top view & (iii) Side view of the object

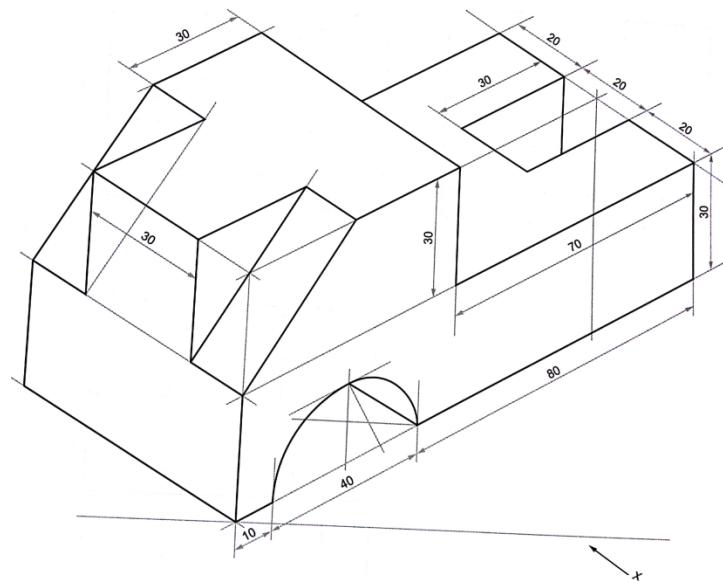


Solution:

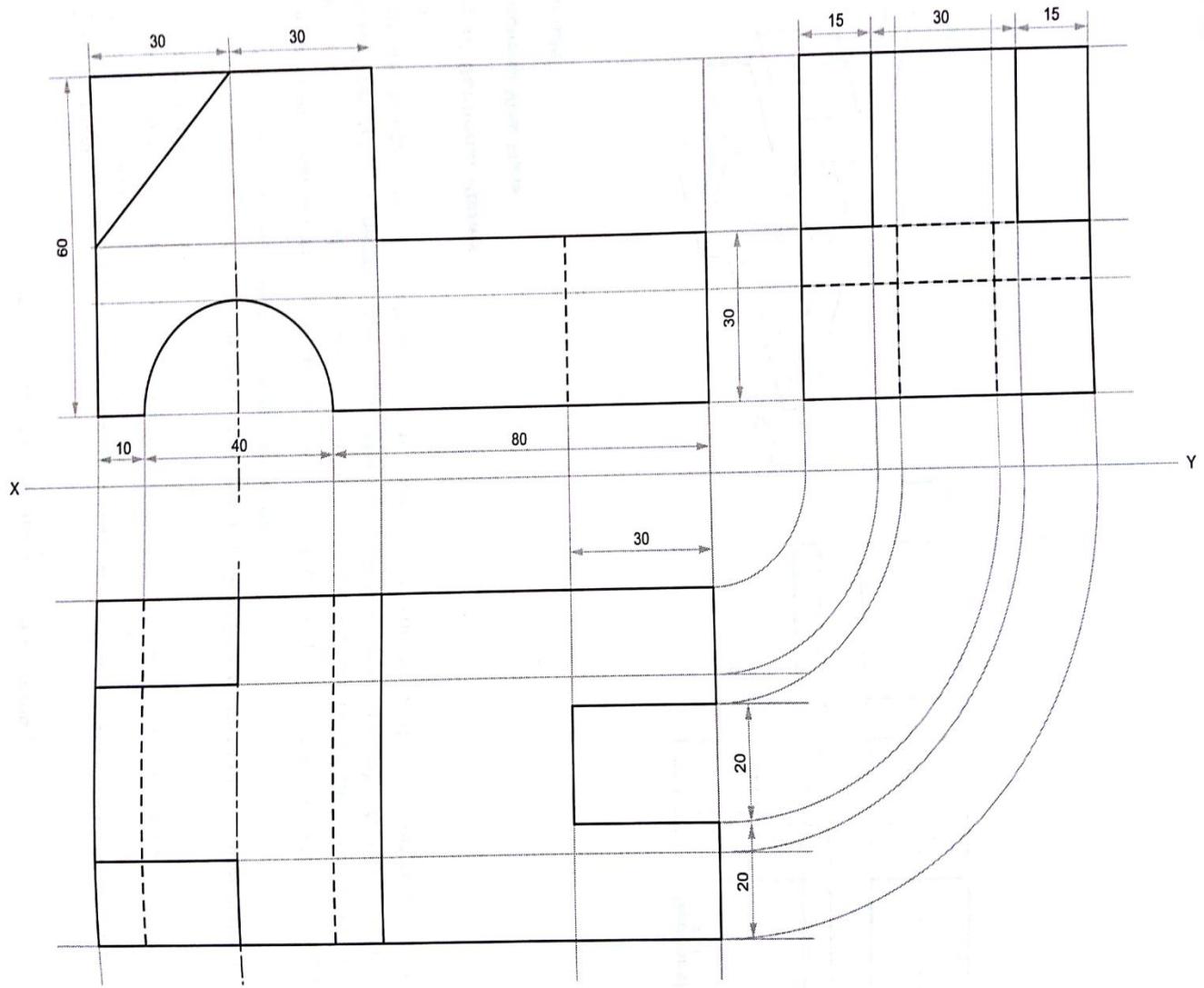


Problem 09: Figure shows pictorial view of object using first angle method of projection draw

(i)Front View (ii) Top view & (iii) Side view of the object



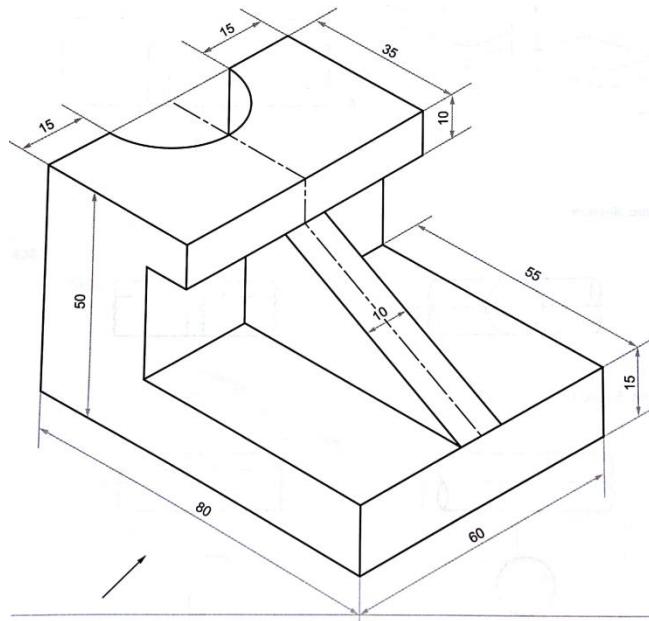
Solution:



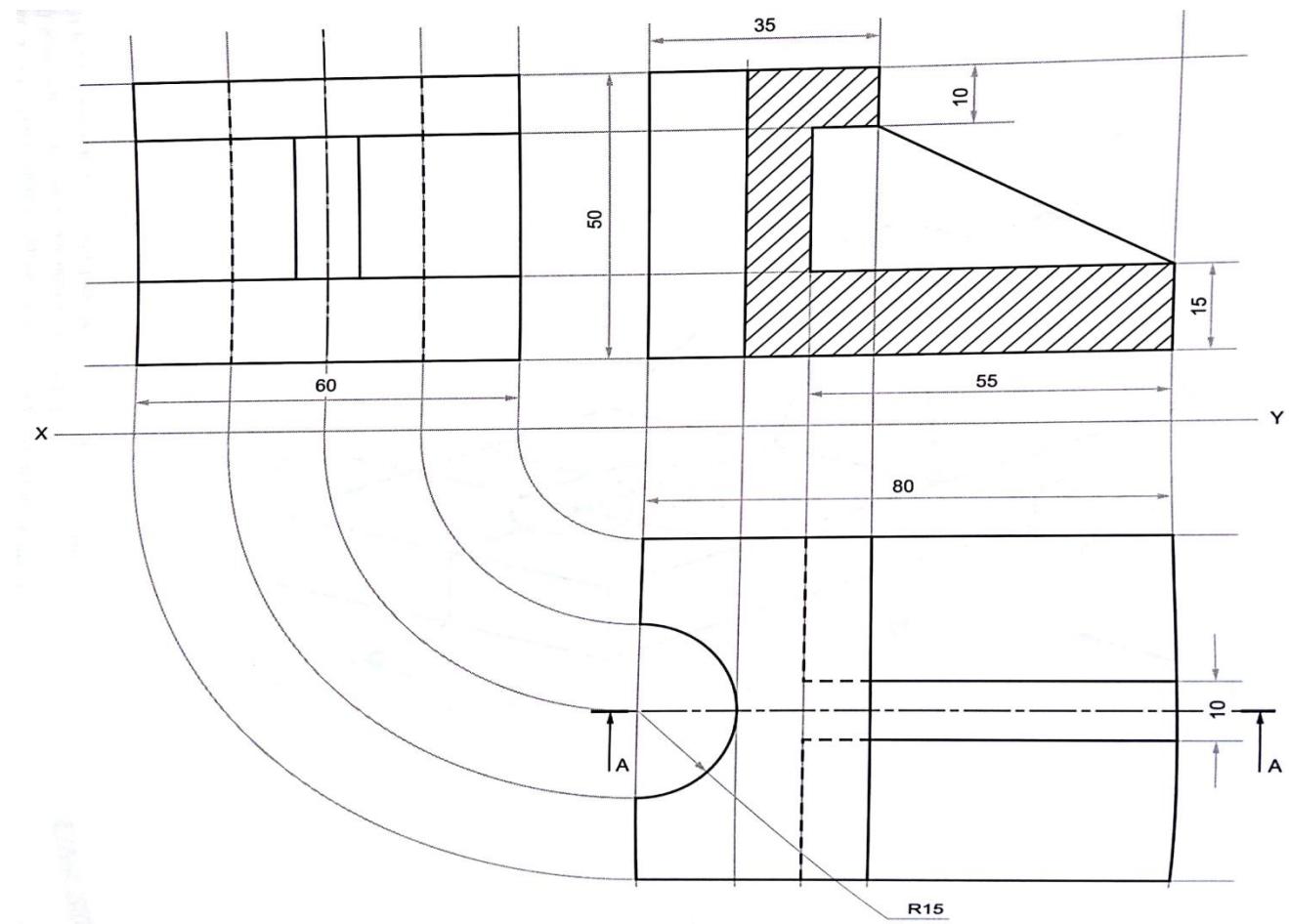
SECTIONAL ORTHOGRAPHIC PROJECTION

Problem 10: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

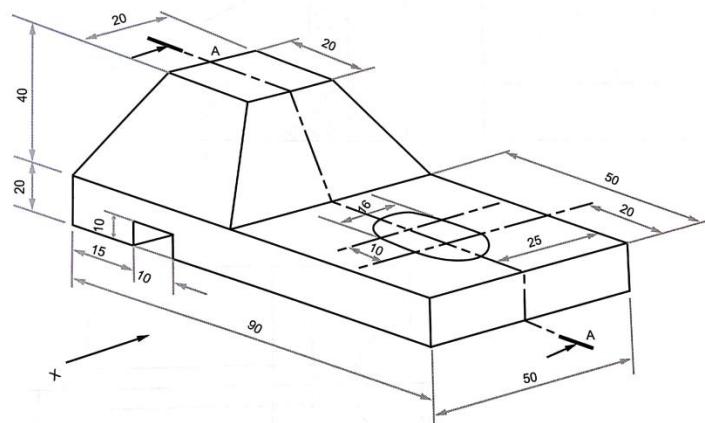


Solution:

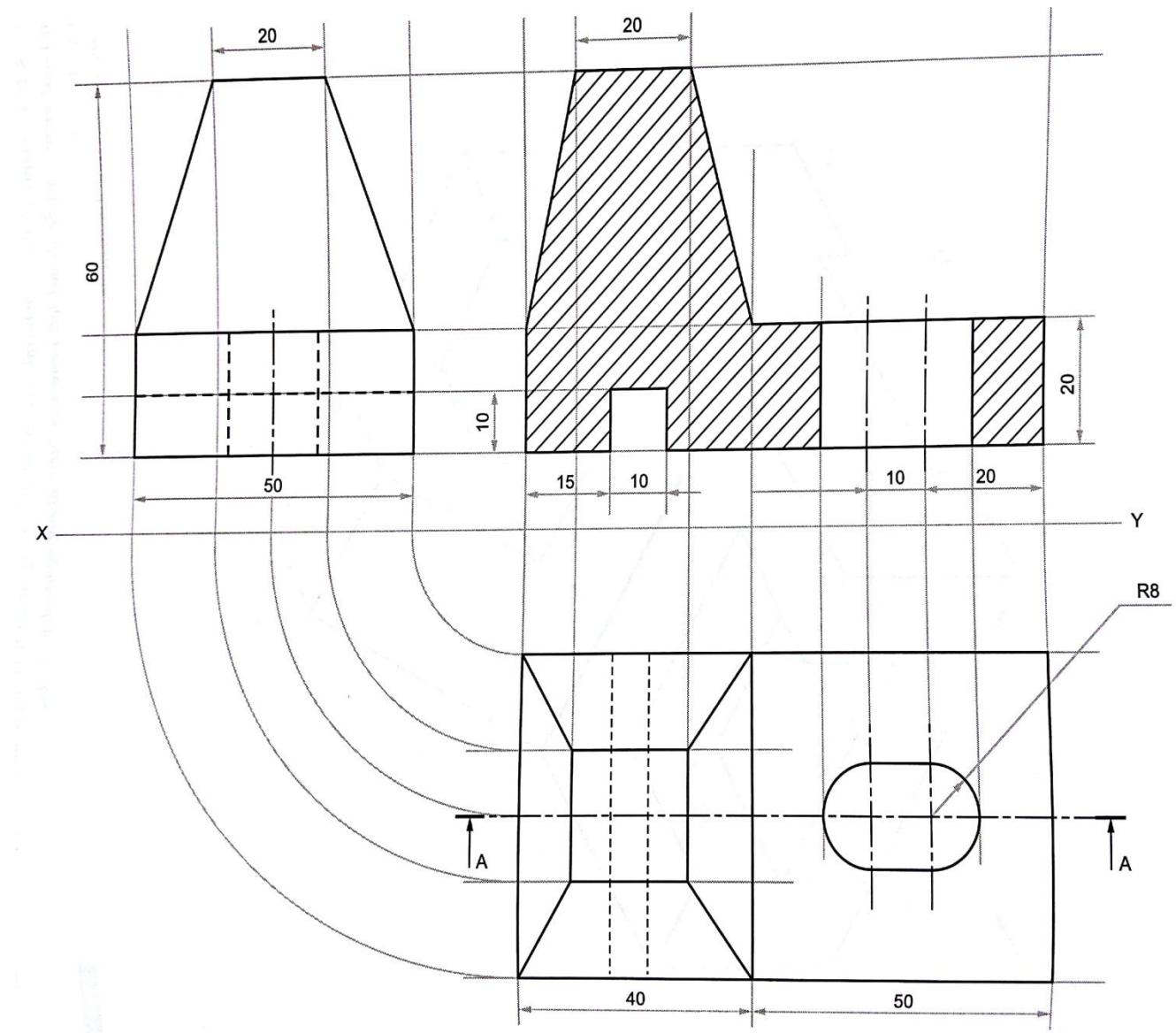


Problem 11: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

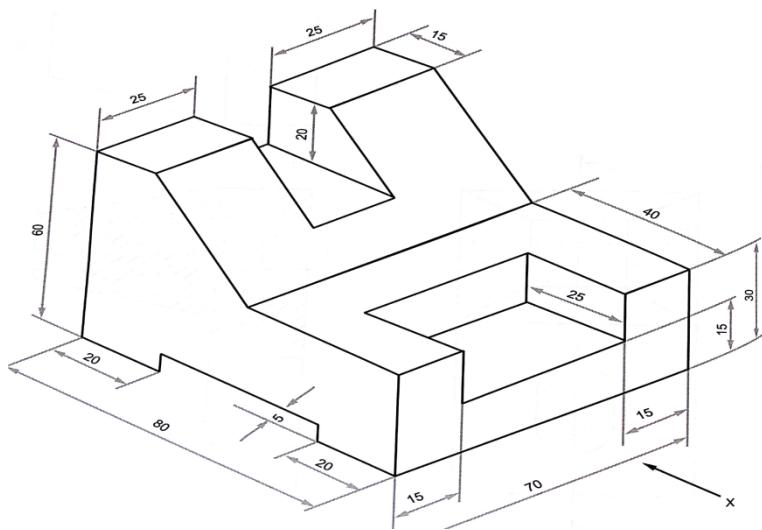


Solution:

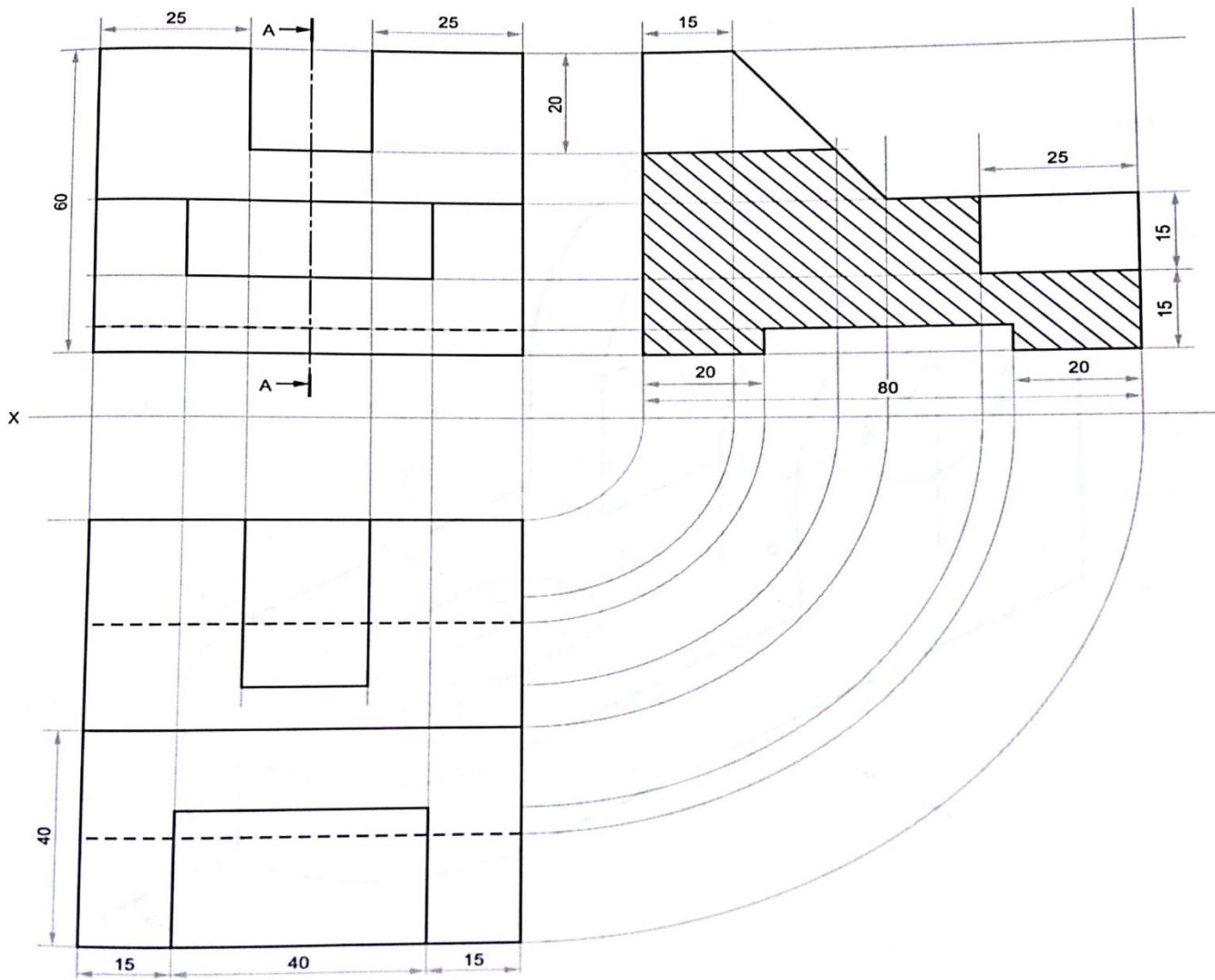


Problem 12: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

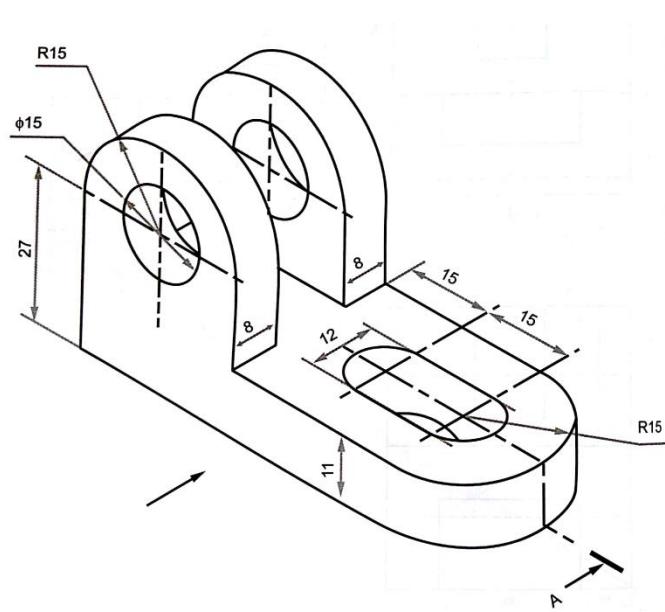


Solution:

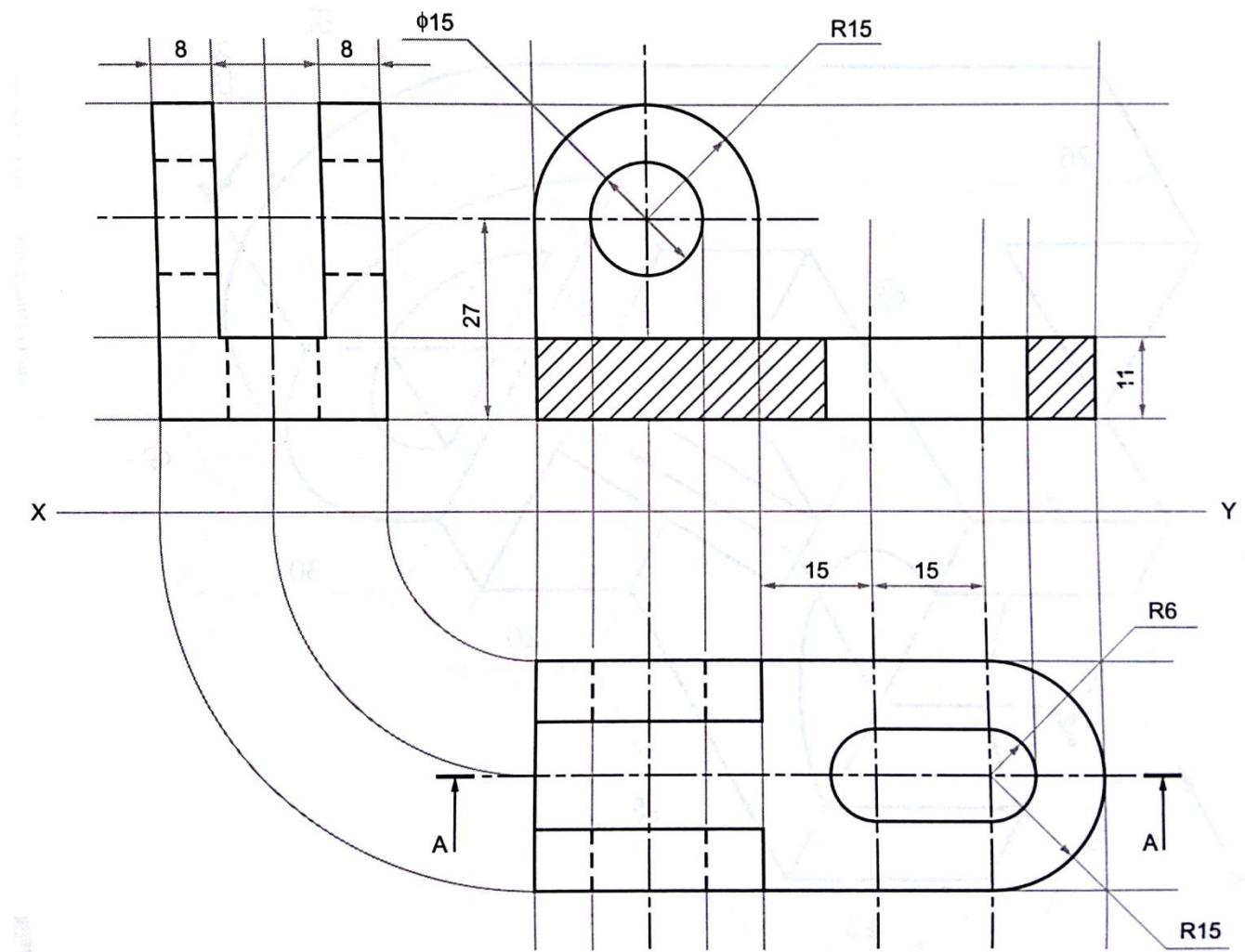


Problem 13: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

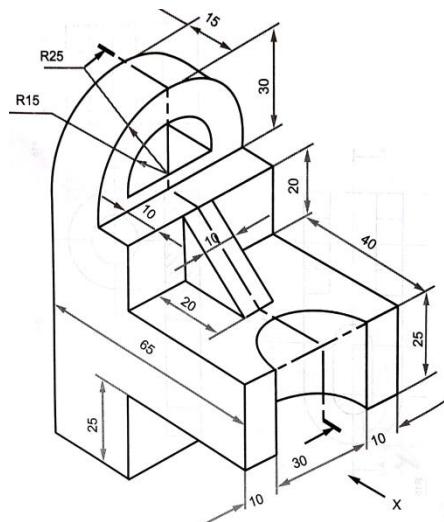


Solution:



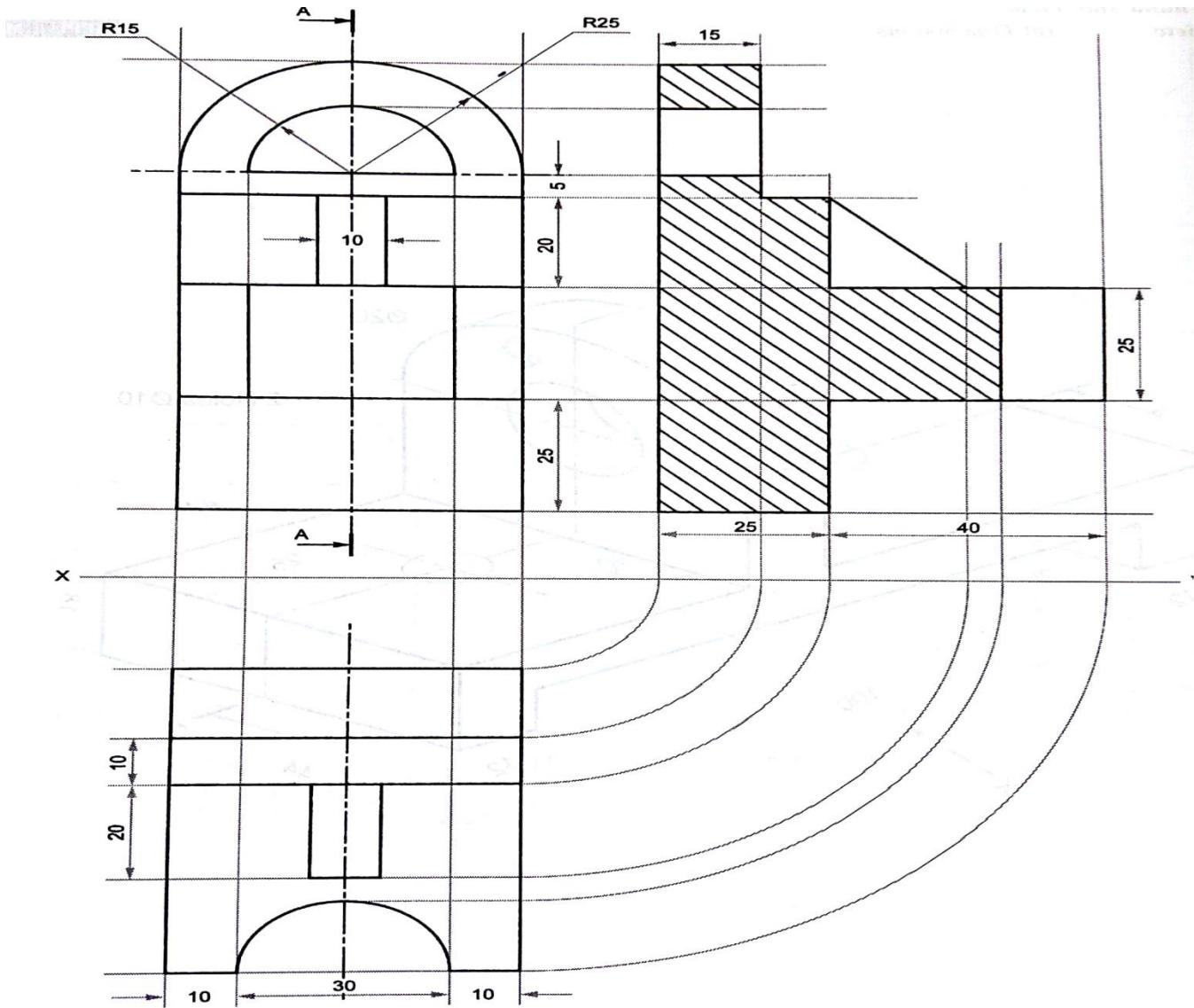
Problem 14: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object



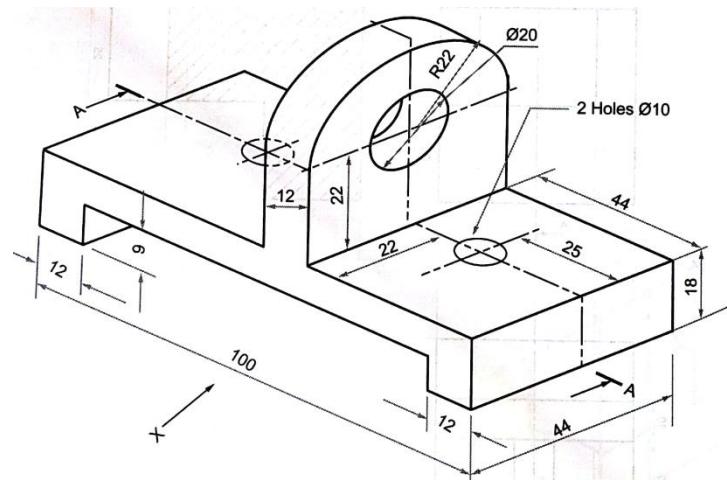
$L=50, H=90, W=65$

Solution:

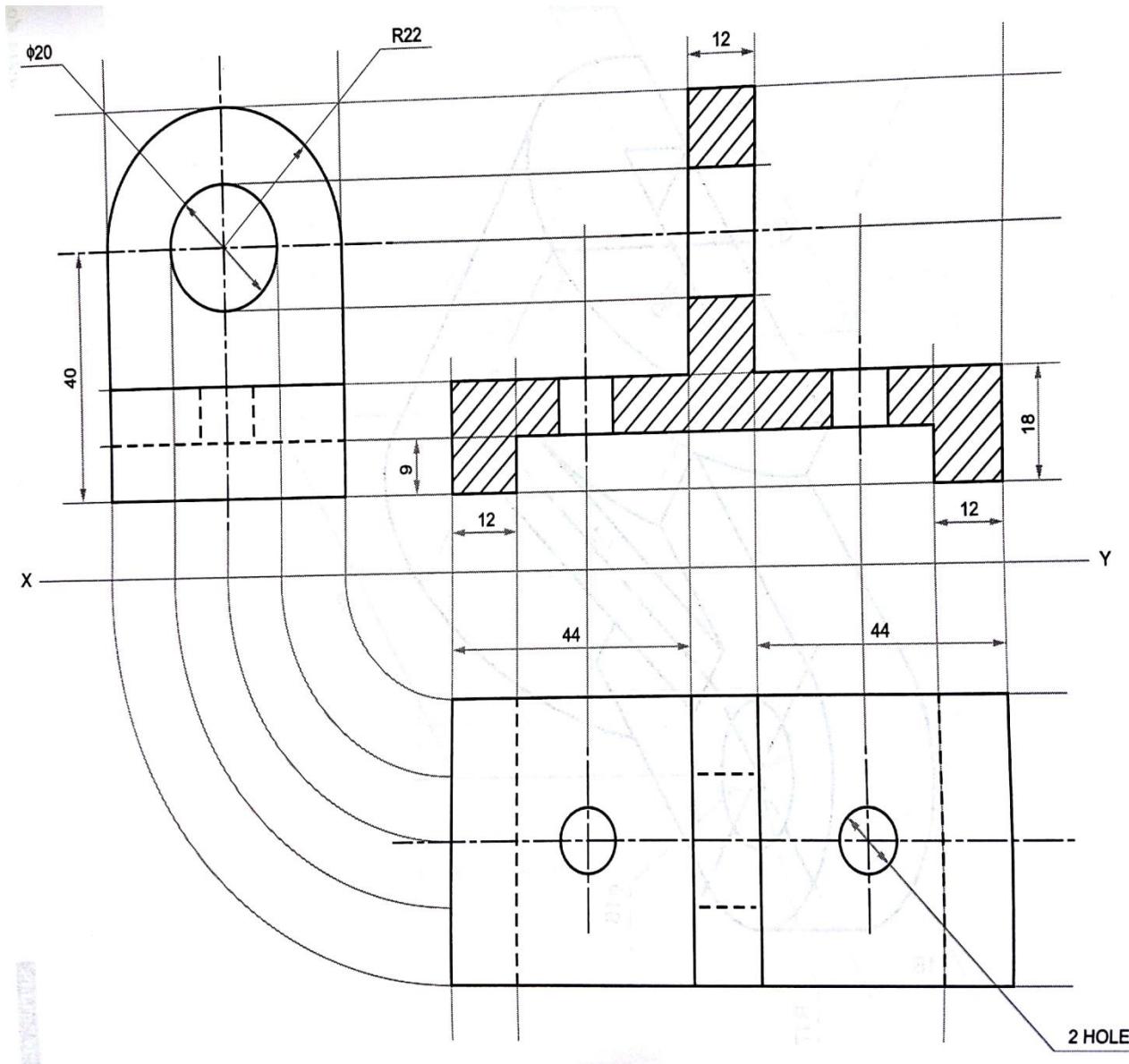


Problem 15: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

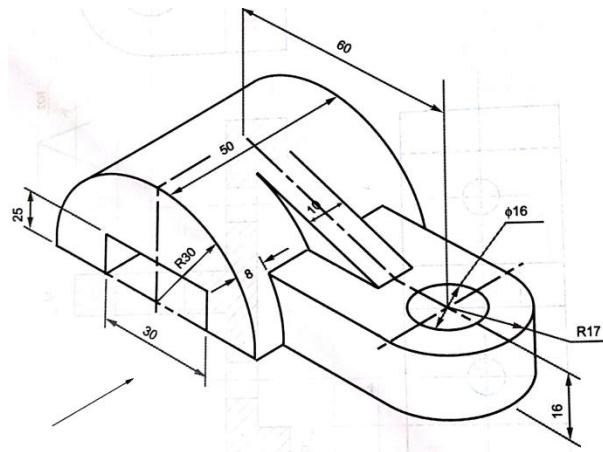


Solution:

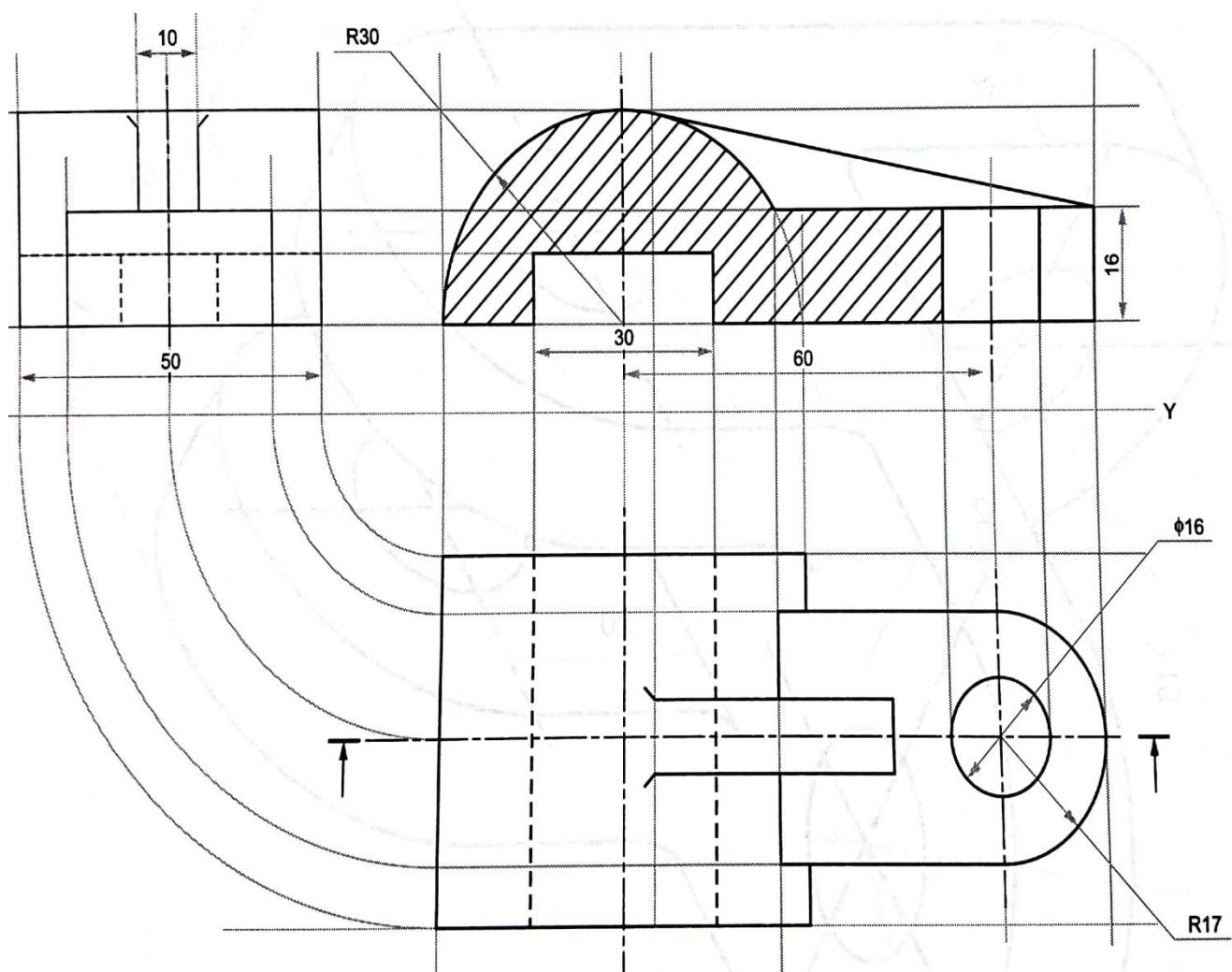


Problem 16: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

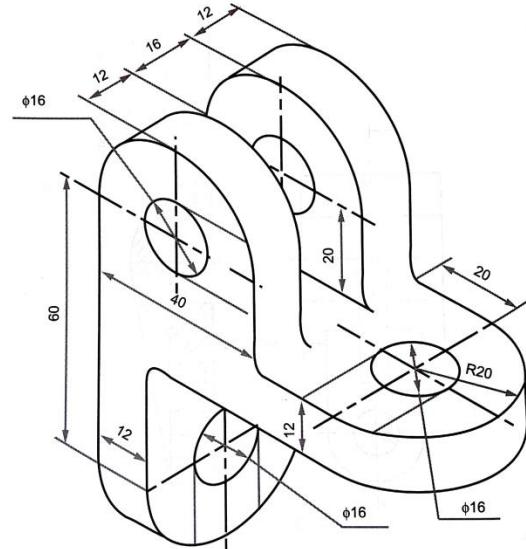


Solution:

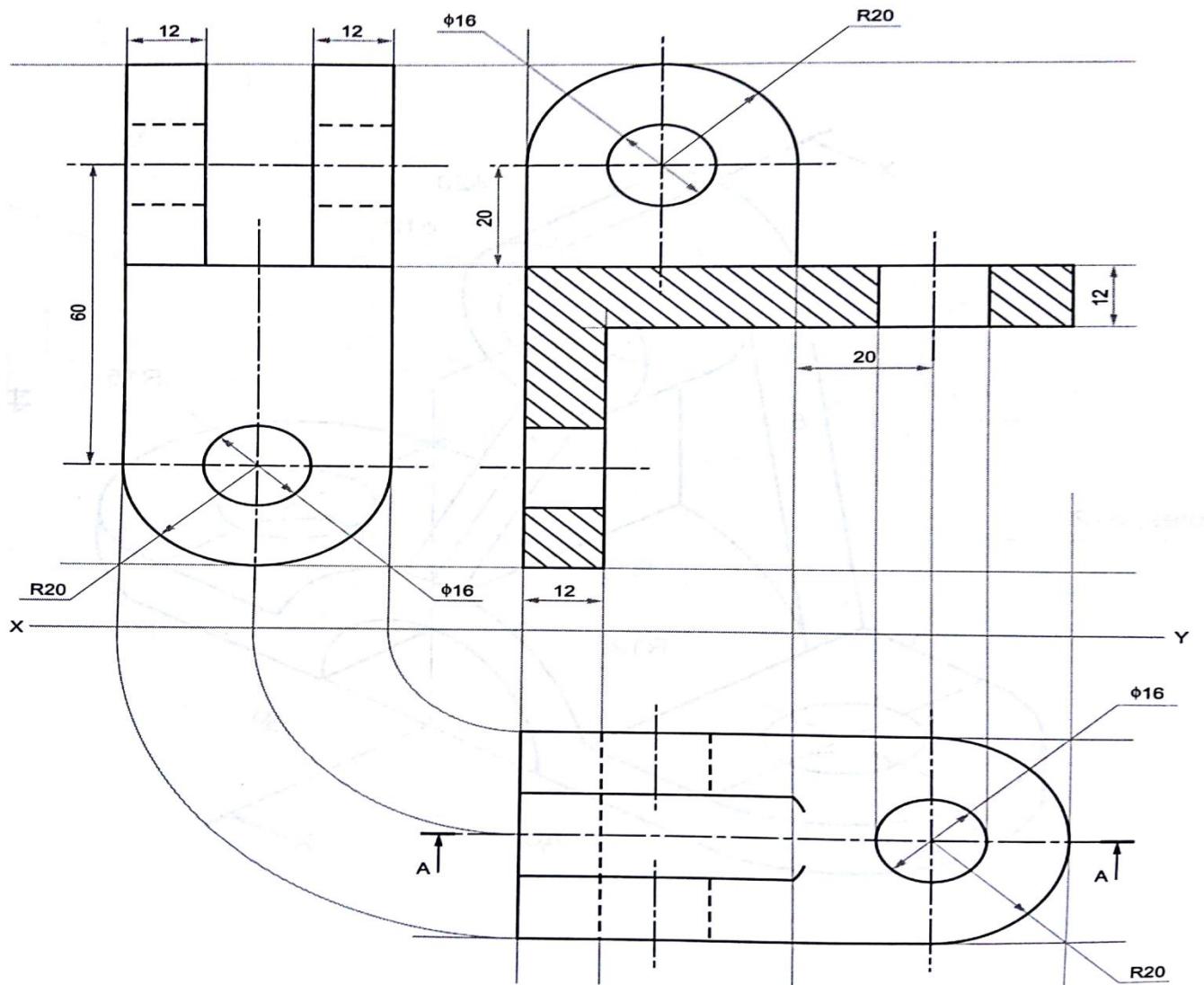


Problem 17: Figure shows pictorial view of object using first angle method of projection draw

(i)Sectional Front View (ii) Top view & (iii) Side view of the object

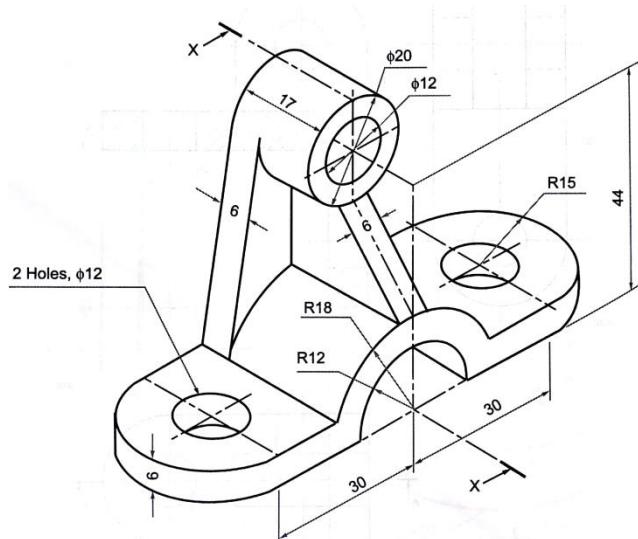


Solution:

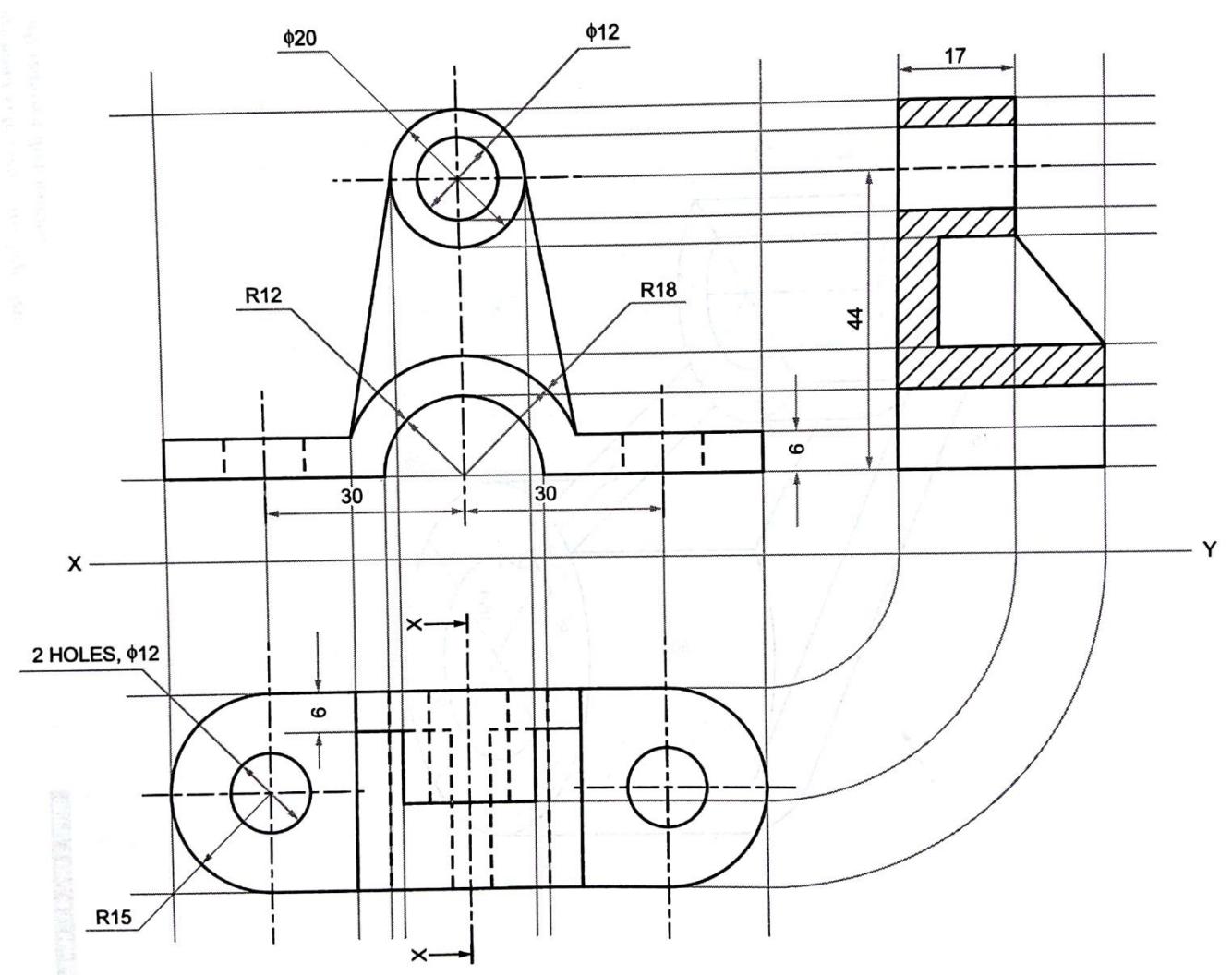


Problem 18: Figure shows pictorial view of object using first angle method of projection draw

- (i)Sectional Front View (ii) Top view & (iii) Side view of the object

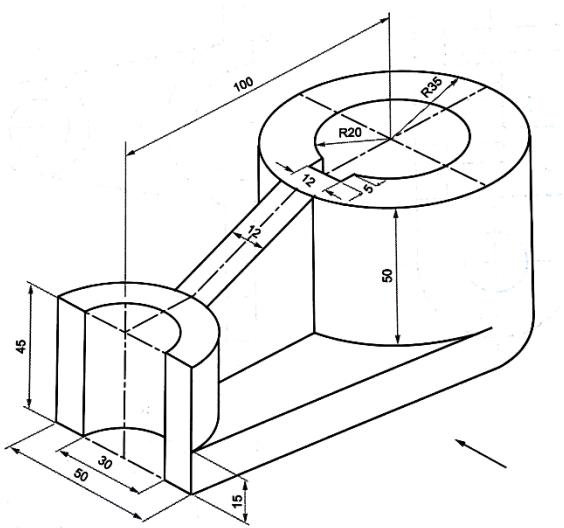


Solution:

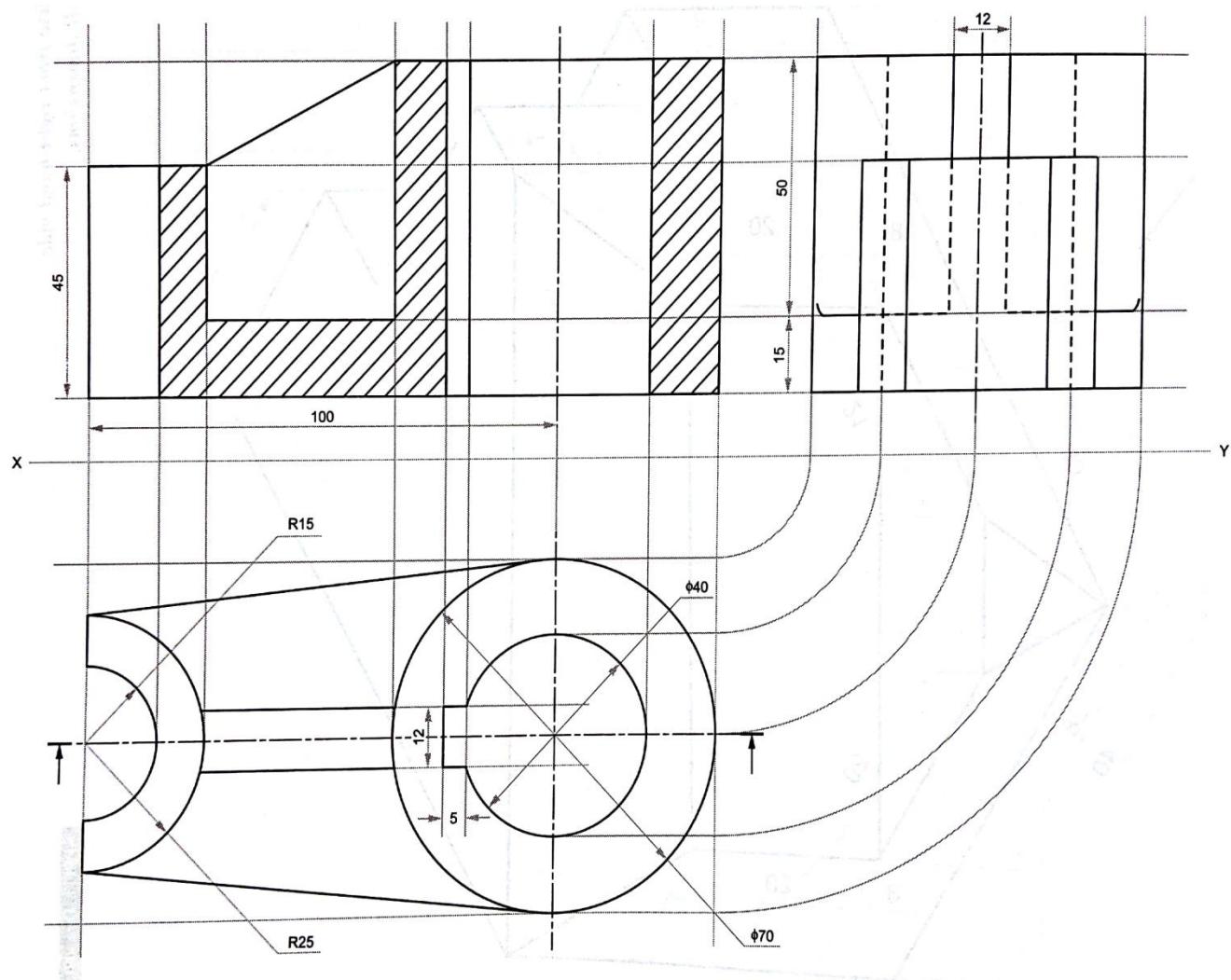


Problem 19: Figure shows pictorial view of object using first angle method of projection draw

- (i)Sectional Front View (ii) Top view & (iii) Side view of the object

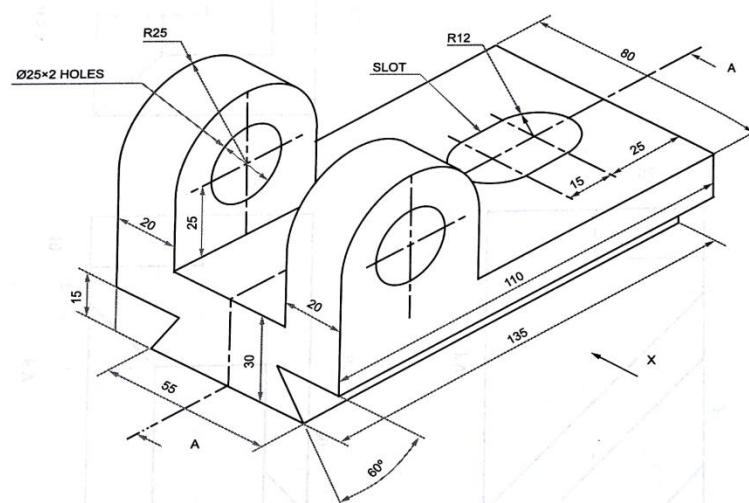


Solution:

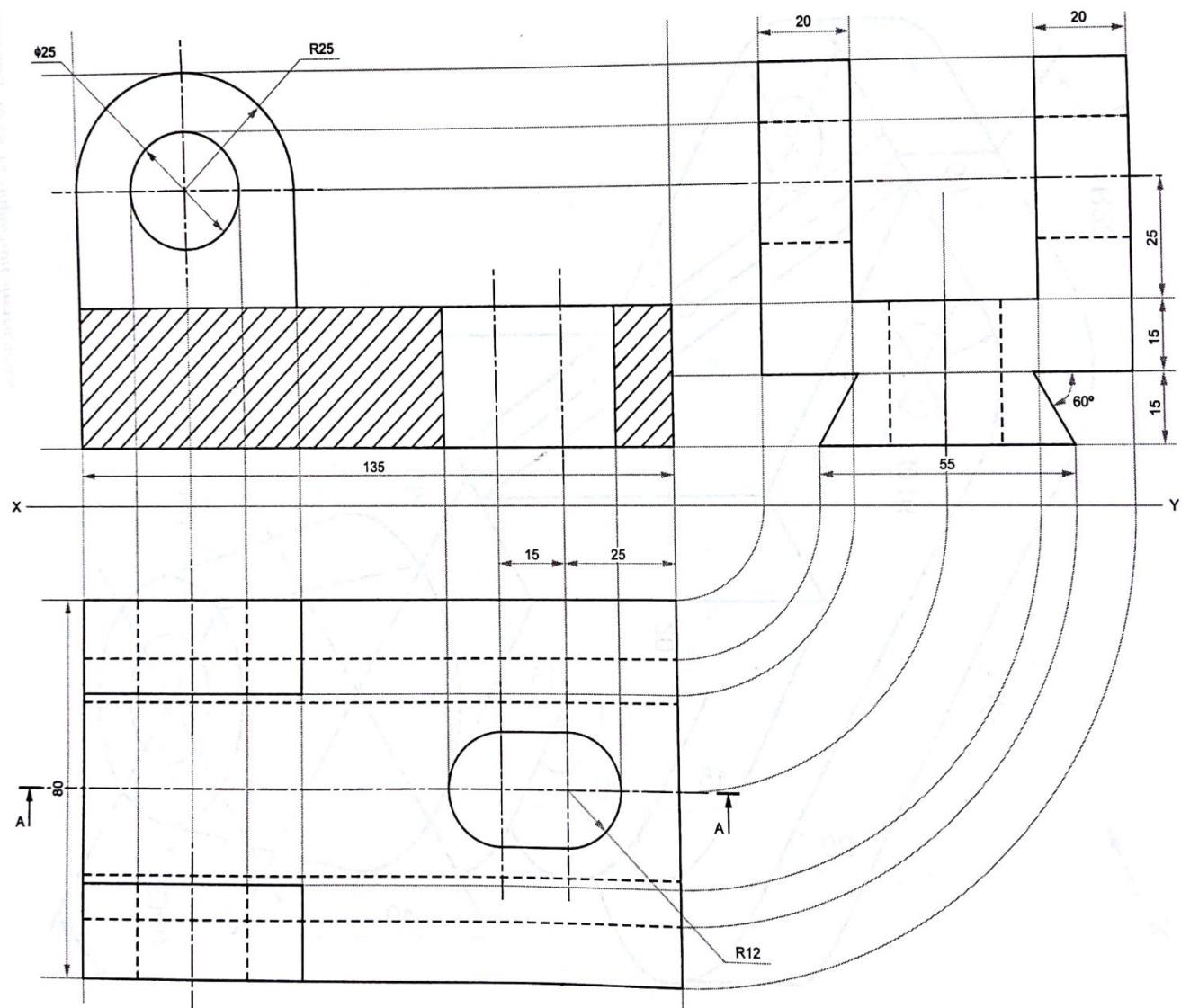


Problem 20: Figure shows pictorial view of object using first angle method of projection draw

- (i)Sectional Front View (ii) Top view & (iii) Side view of the object

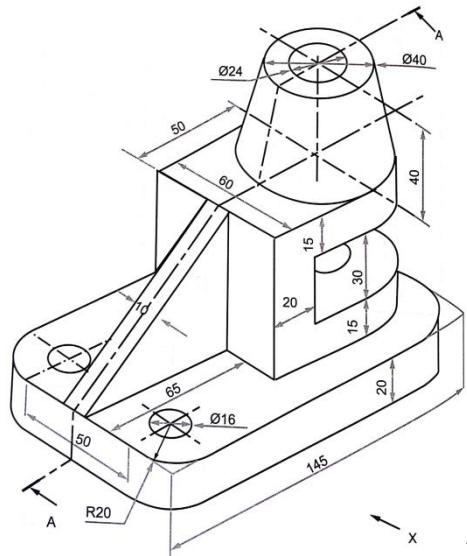


Solution:



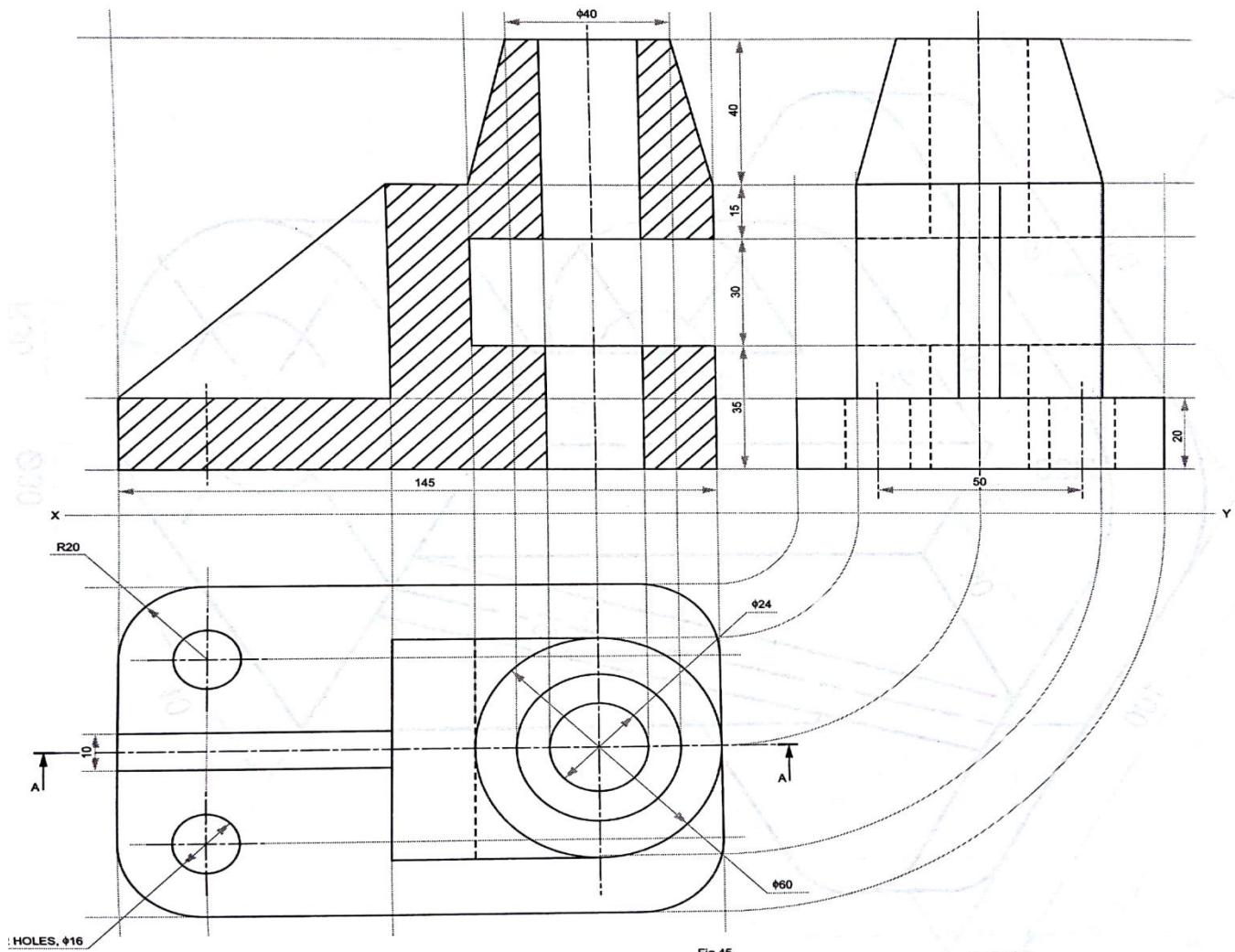
Problem 21: Figure shows pictorial view of object using first angle method of projection draw

- (i) Sectional Front View (ii) Top view & (iii) Side view of the object



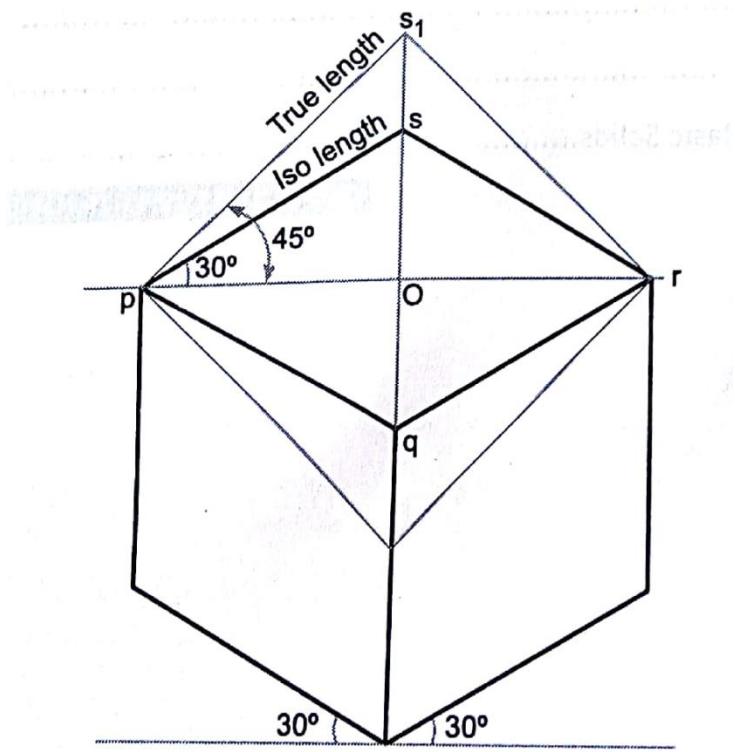
$L=145 \text{ H}=120 \text{ W}=90$

Solution:

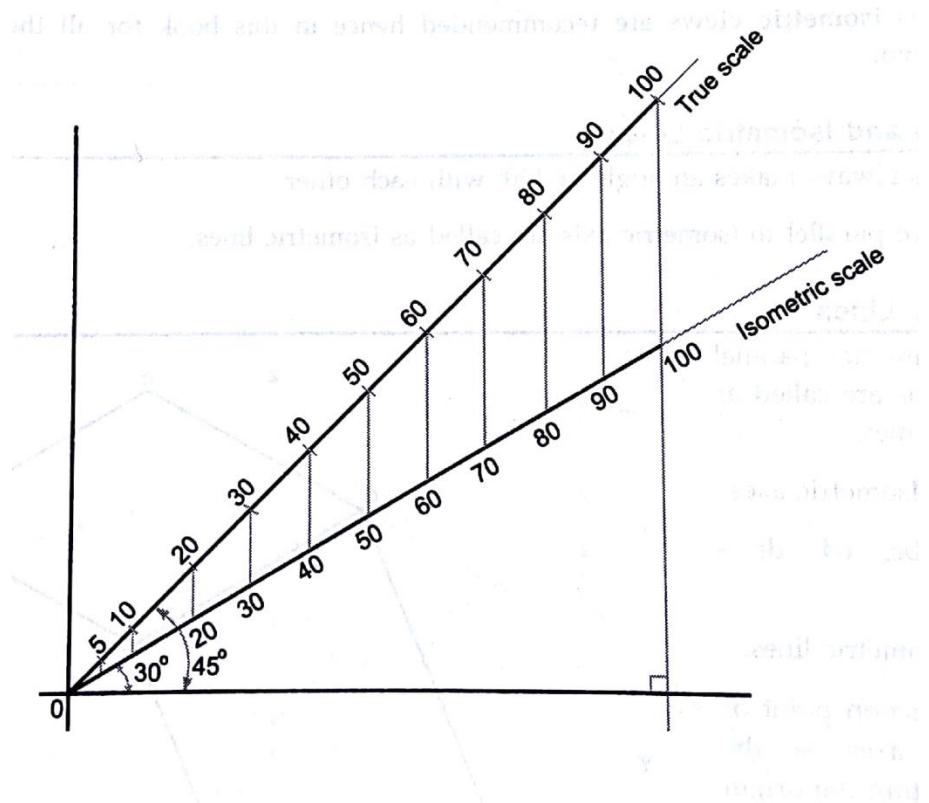


UNIT-V: ISOMETRIC PROJECTION

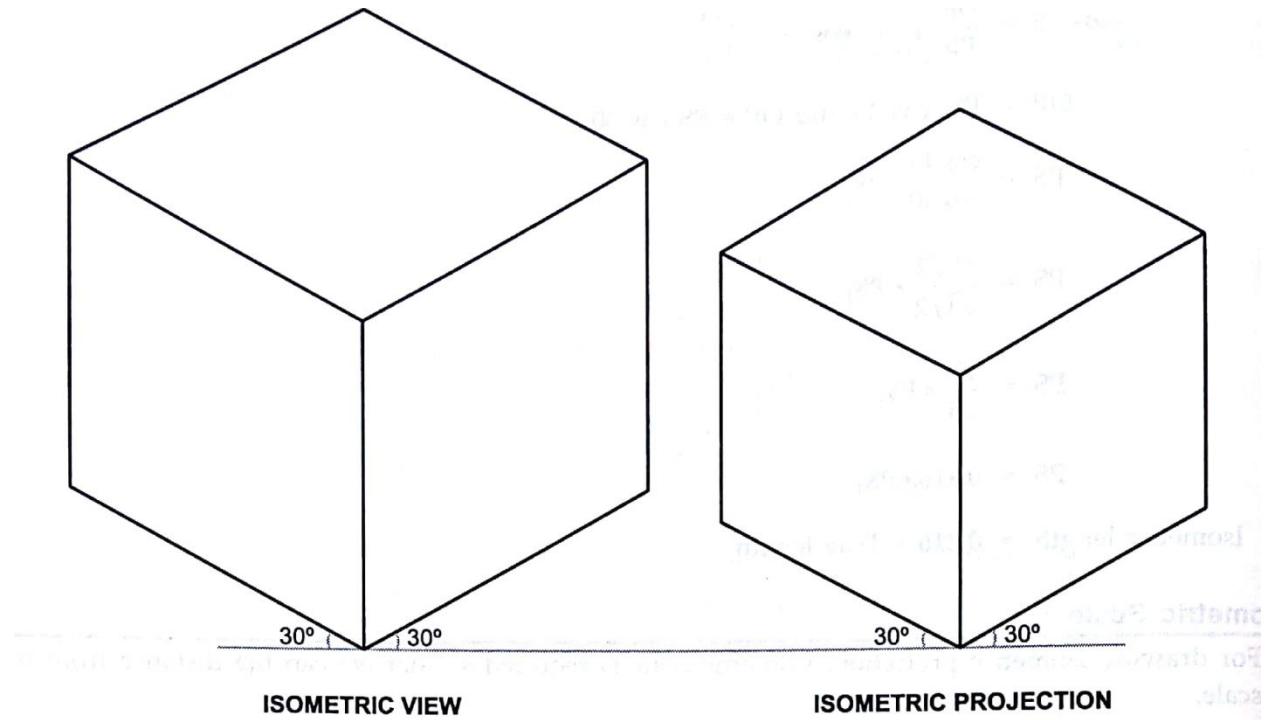
Isometric Length:



Isometric Scale:



Isometric View & Isometric Projection:



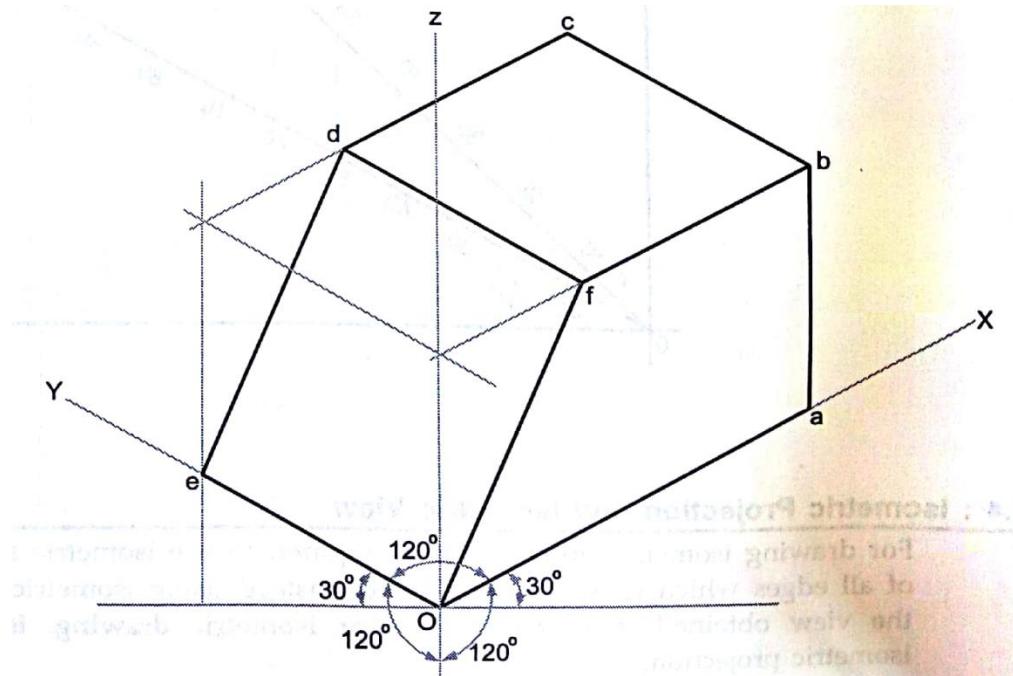
Isometric axis & Isometric Lines:

Isometric axis always makes 120° angle with each other.

Lines which are parallel to isometric axis is called isometric lines.

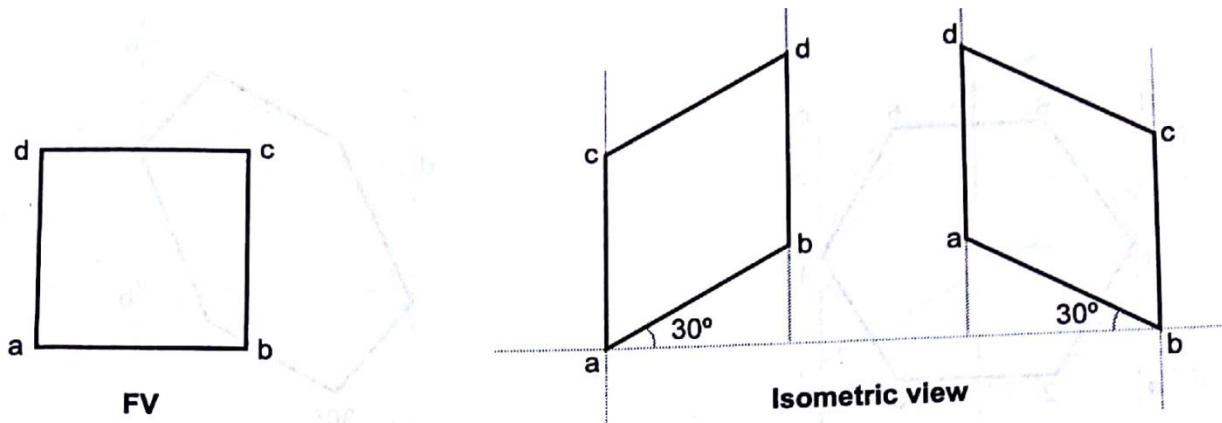
Non Isometric Lines:

Lines which are not parallel to isometric axis are known as non isometric lines.

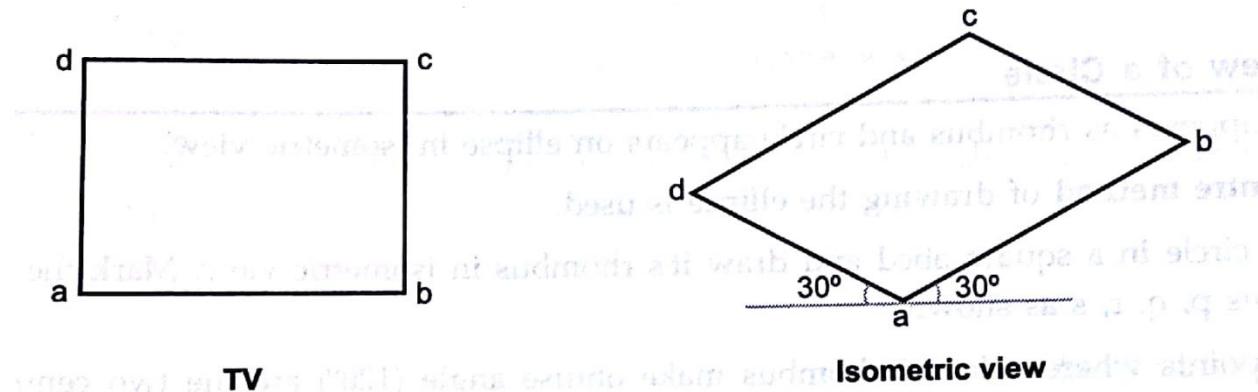


Isometric Views of-

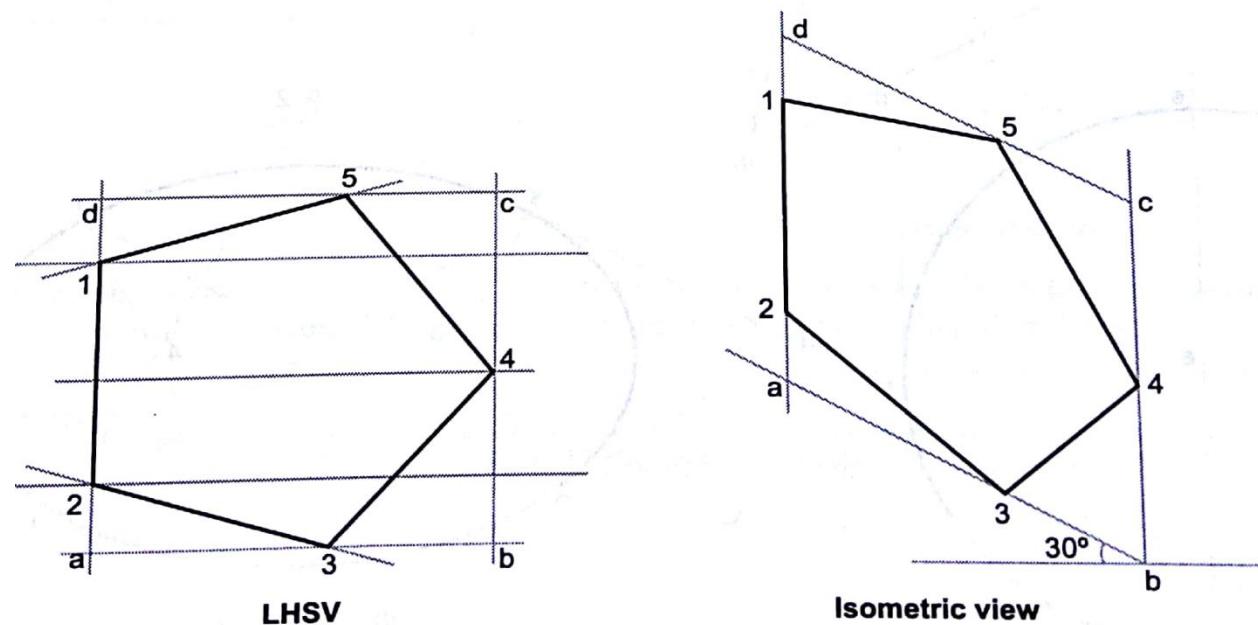
Square:



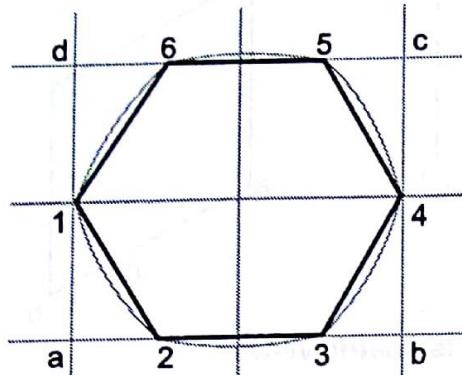
Rectangle:



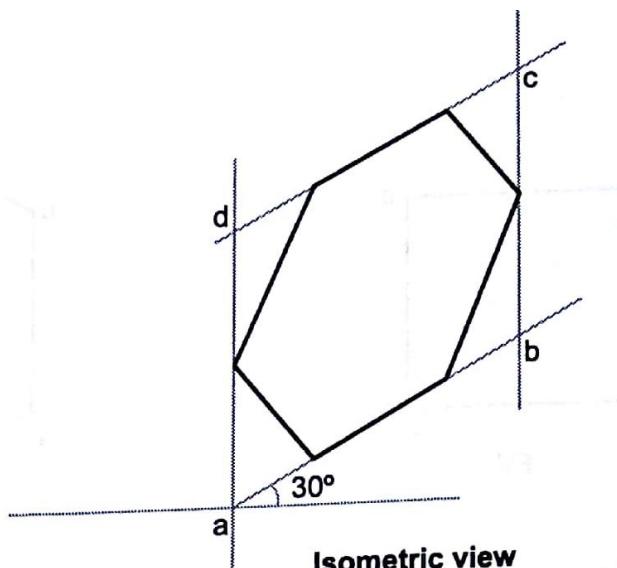
Pentagon:



Hexagon:

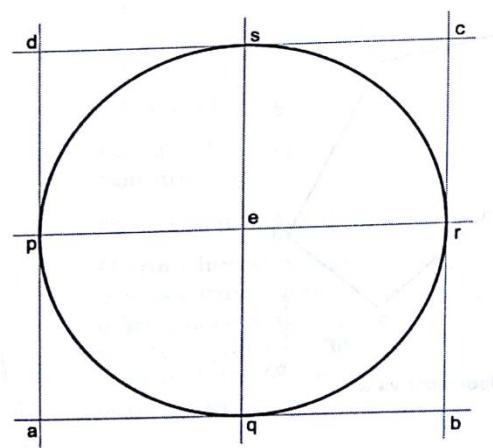


RHSV

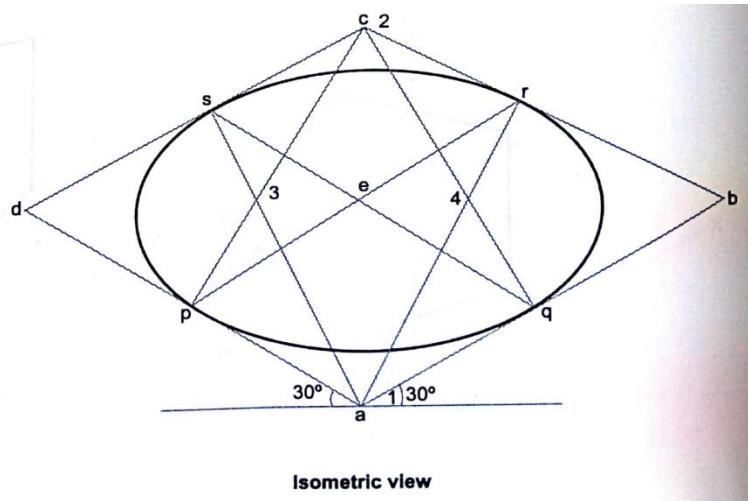


Isometric view

Circle:

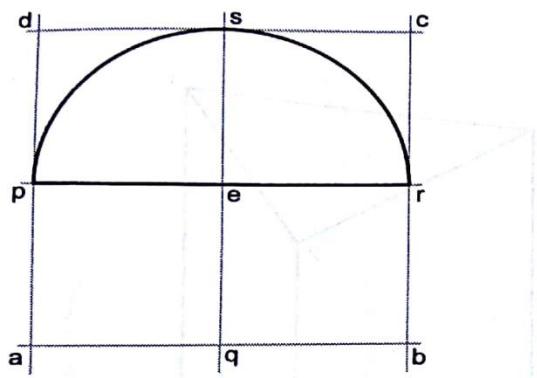


TV

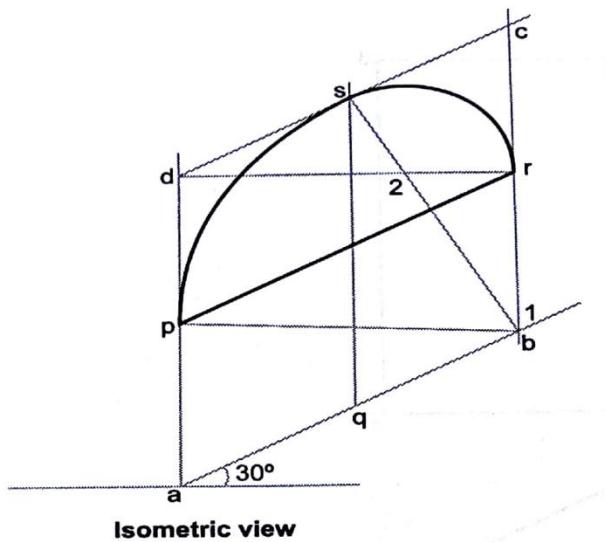


Isometric view

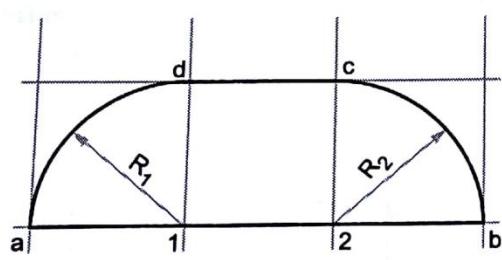
Semicircle:



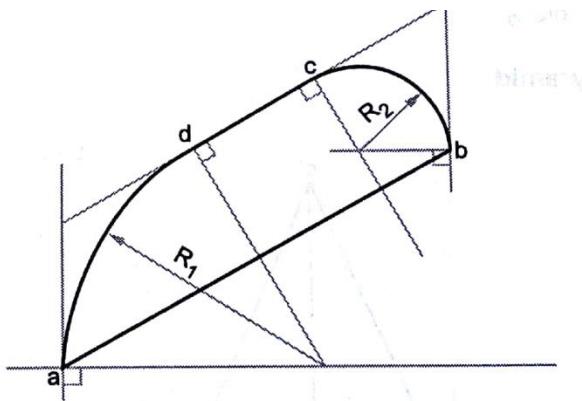
FV



Quarter circle:

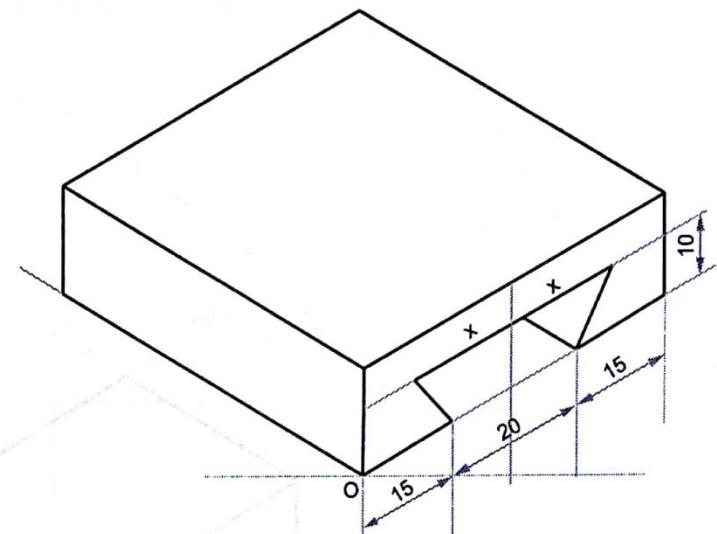
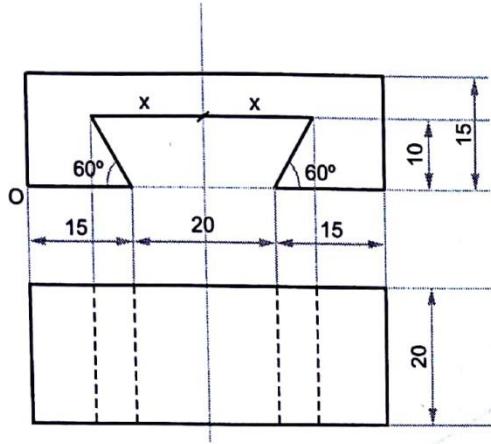


FV

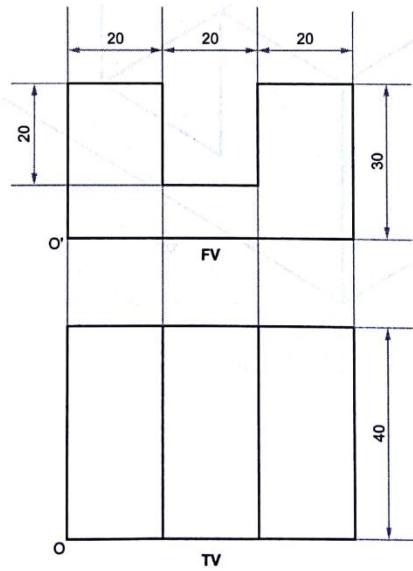


Isometric view

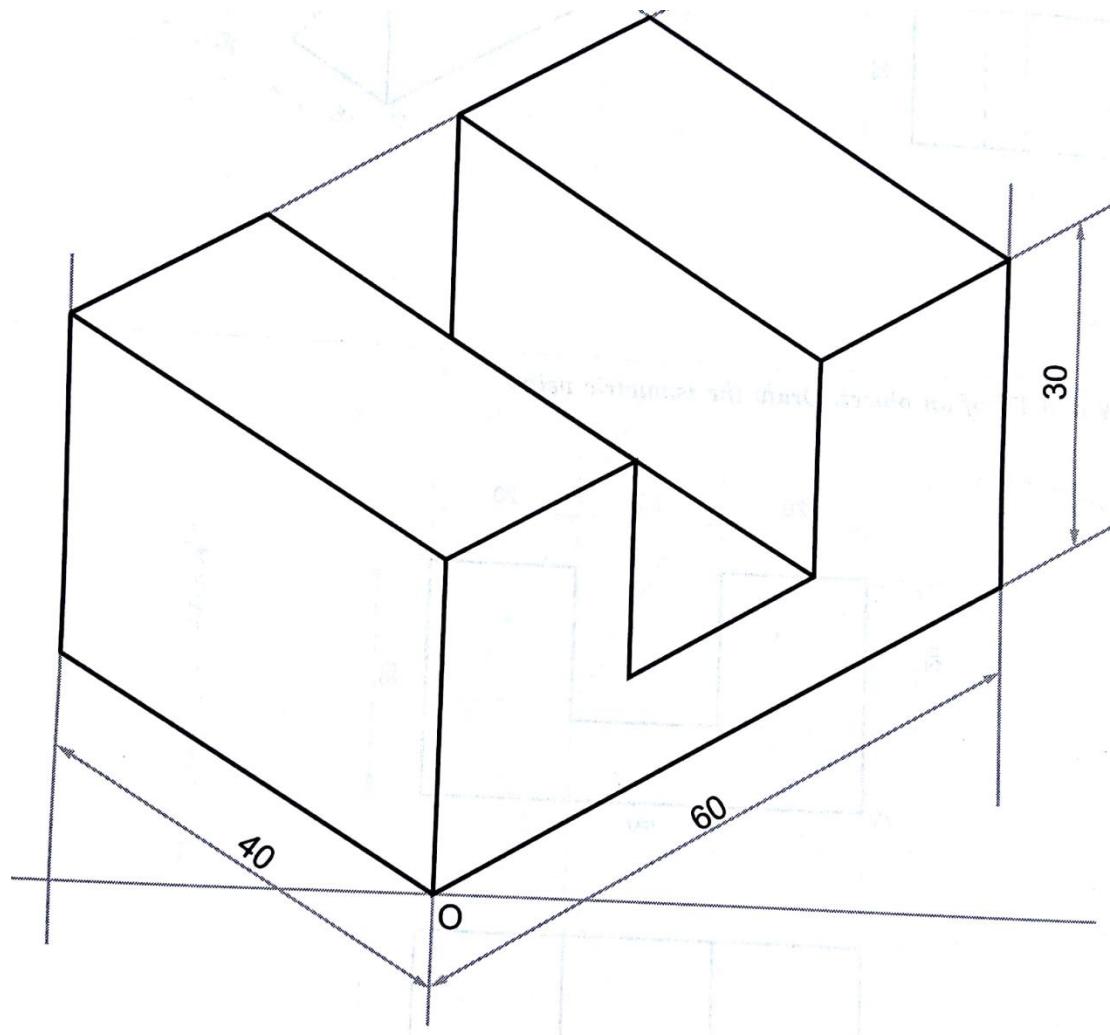
Angles:



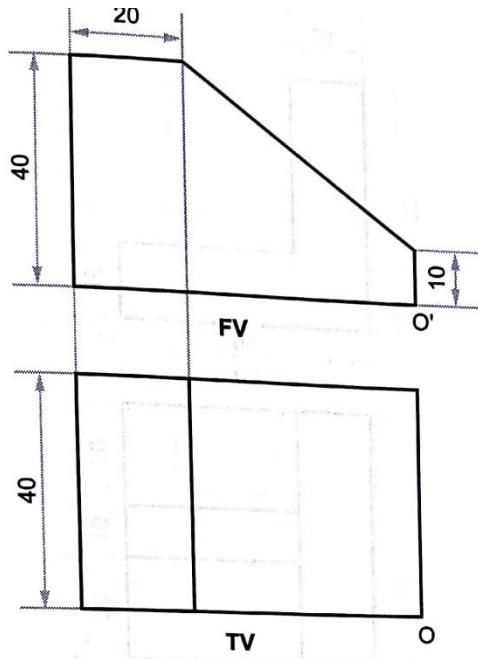
Problem 01: Draw isometric view from following orthographic views.



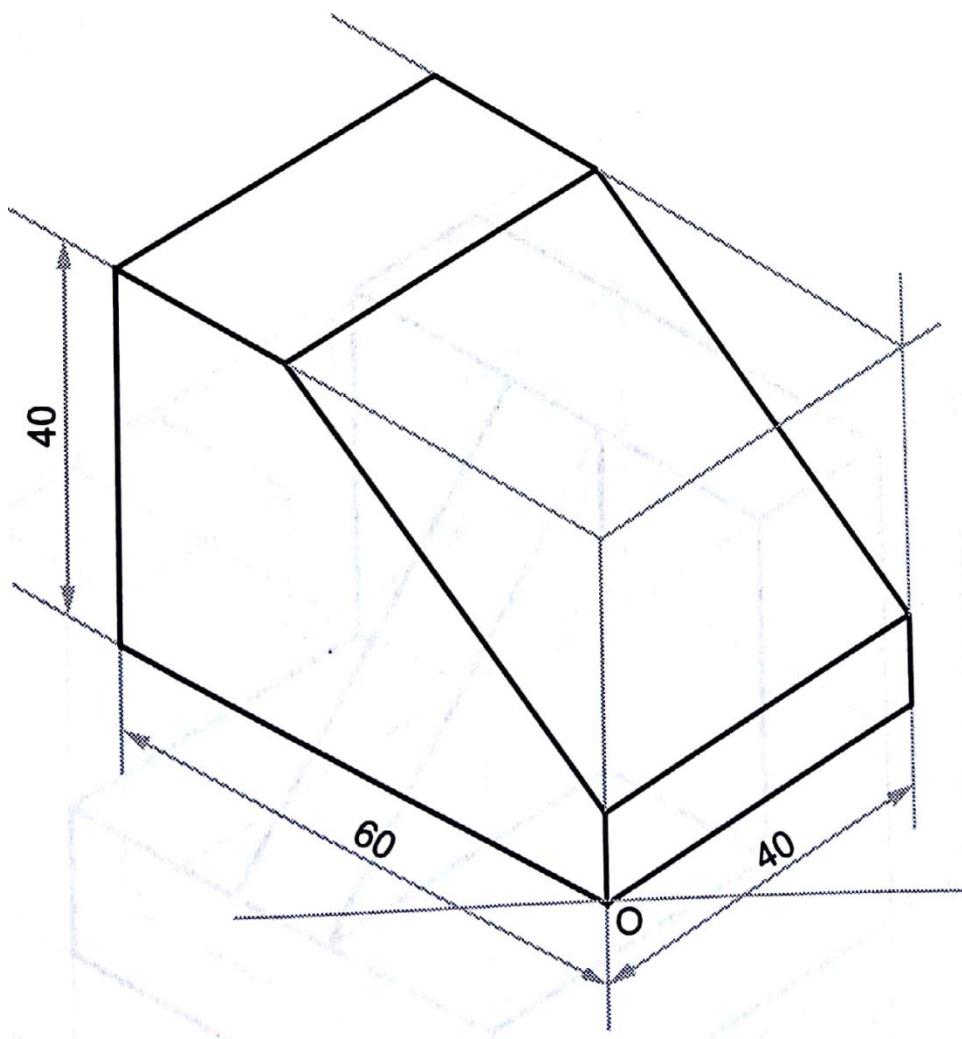
Solution:



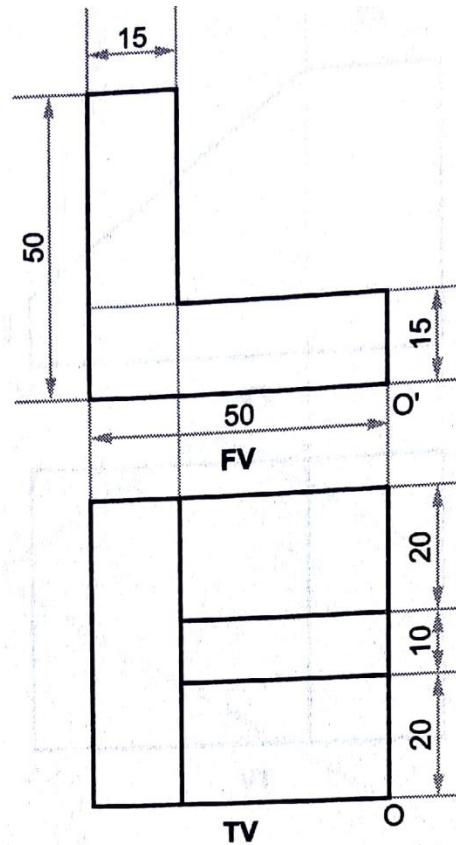
Problem 02: Draw isometric view from following orthographic views.



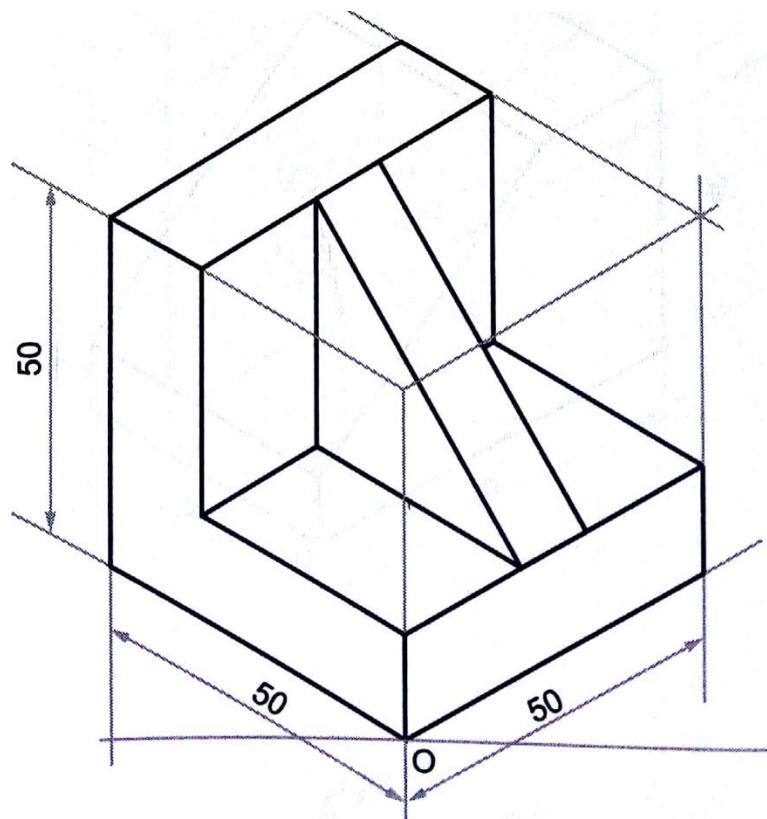
Solution:



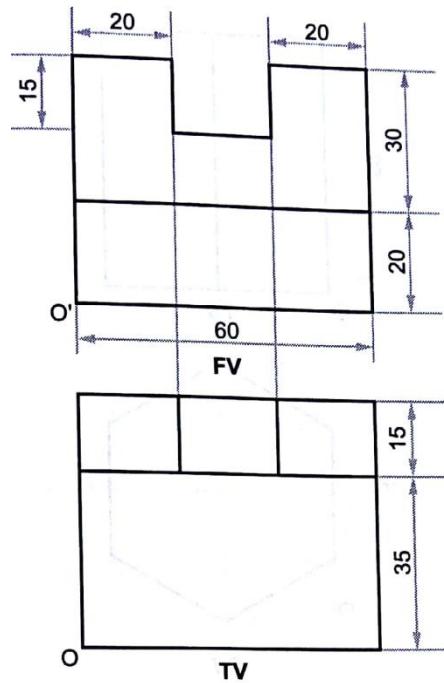
Problem 03: Draw isometric view from following orthographic views.



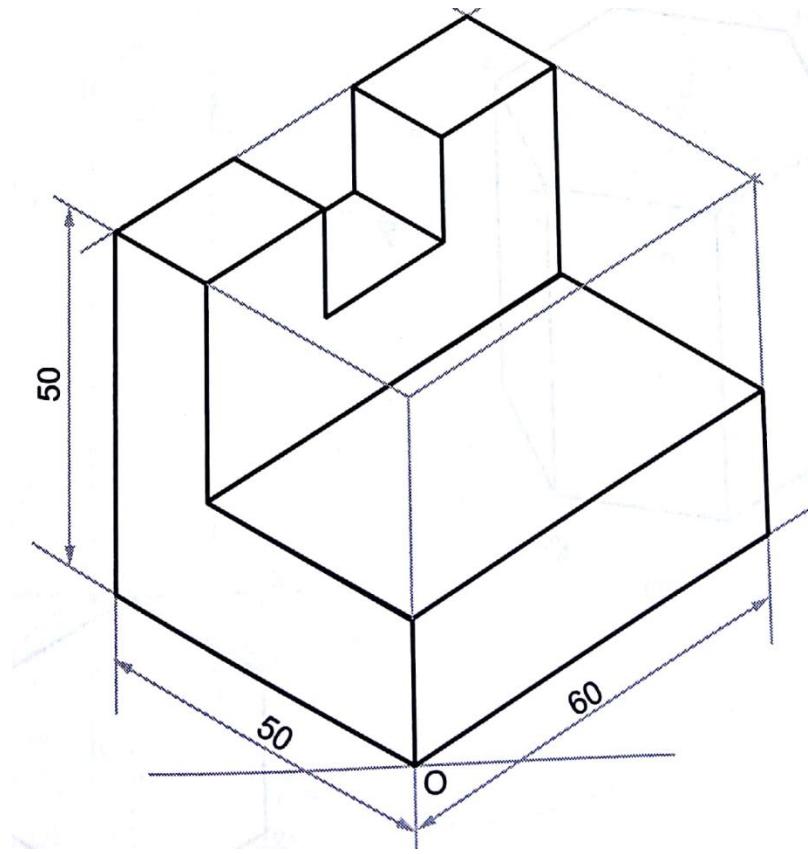
Solution:



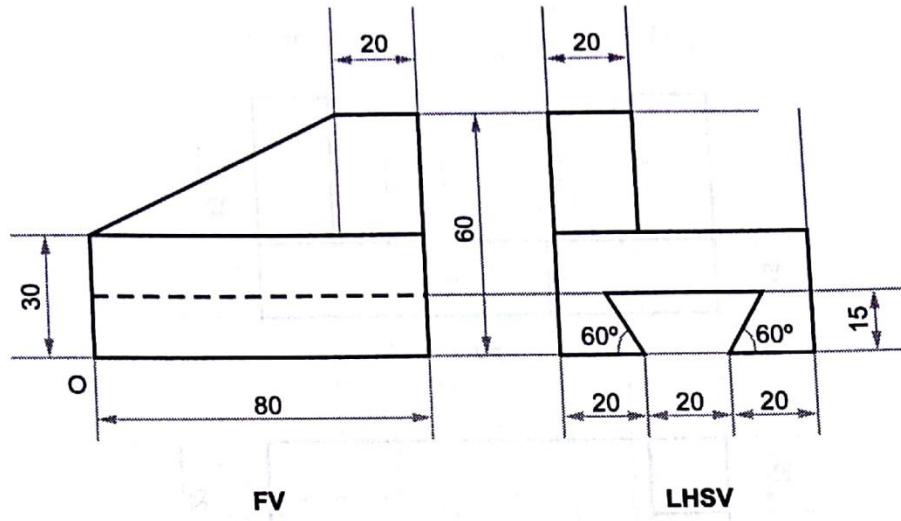
Problem 04: Draw isometric view from following orthographic views.



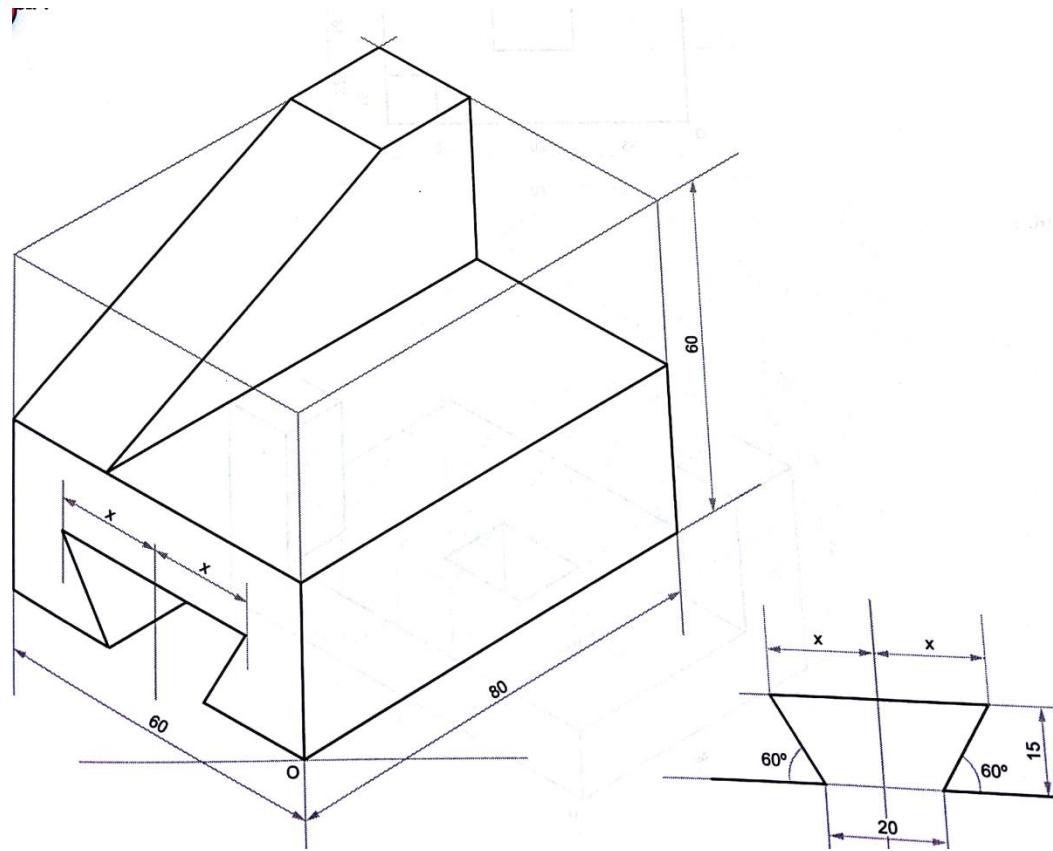
Solution:



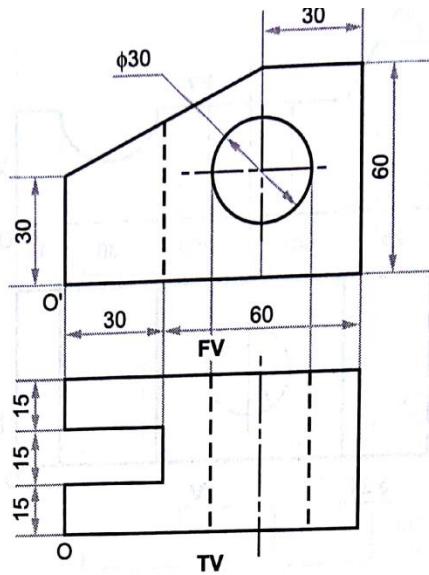
Problem 05: Draw isometric view from following orthographic views.



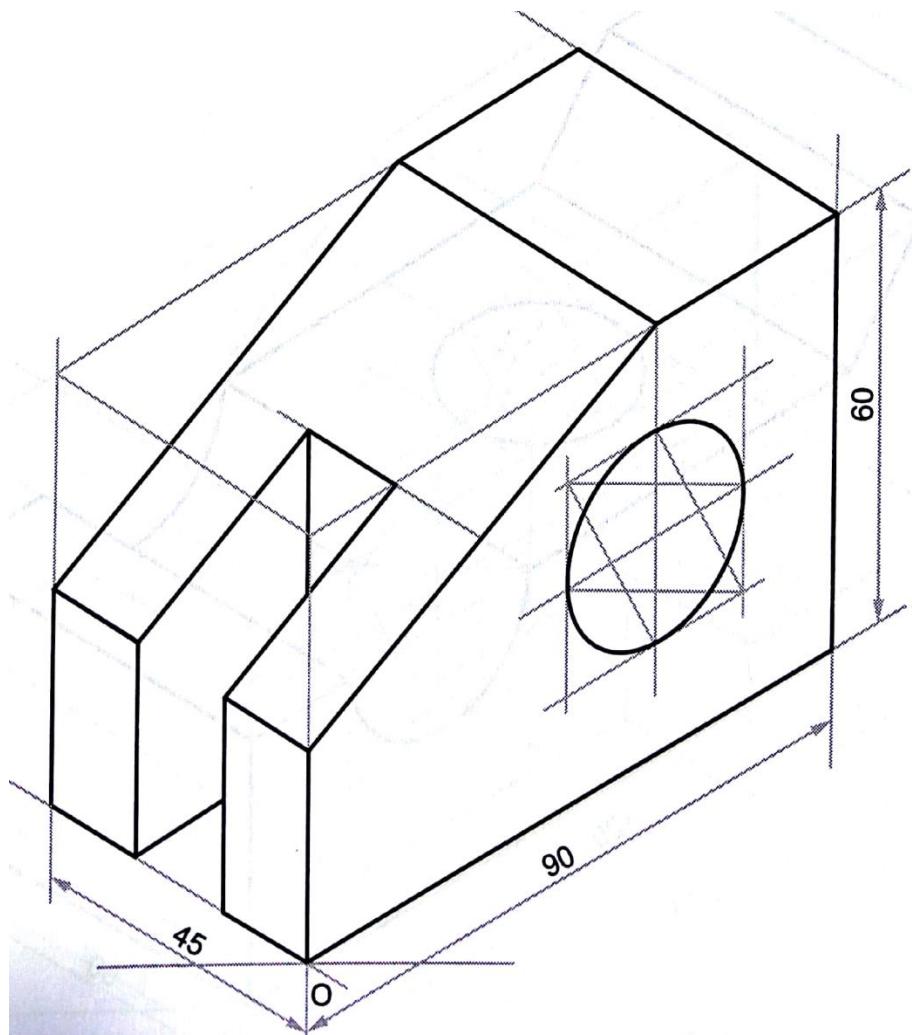
Solution:



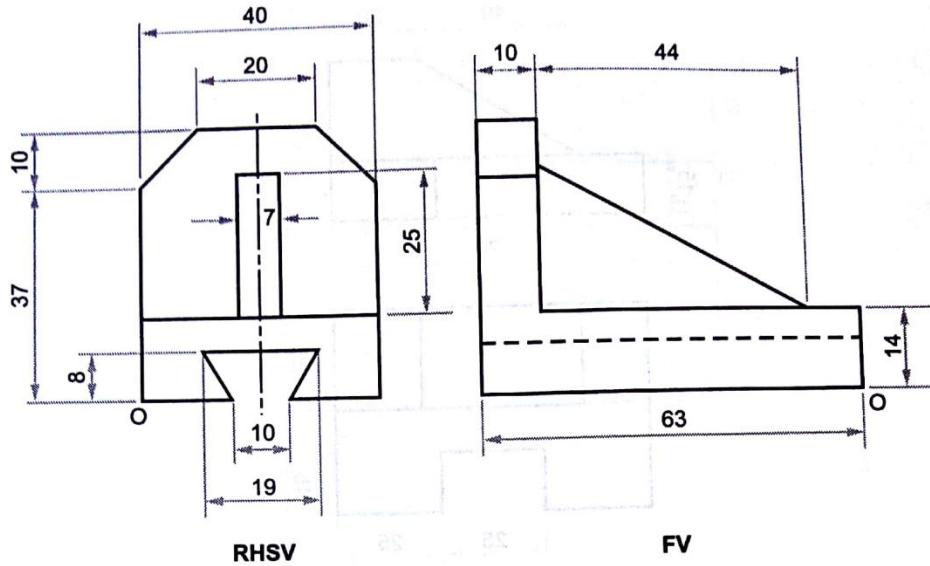
Problem 06: Draw isometric view from following orthographic views.



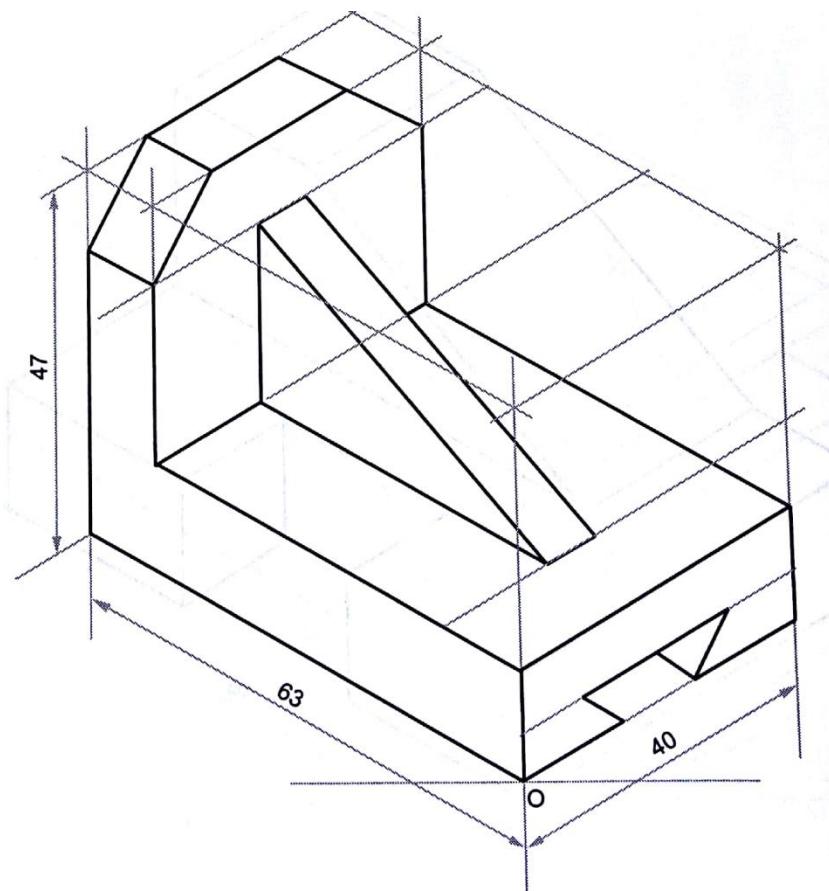
Solution:



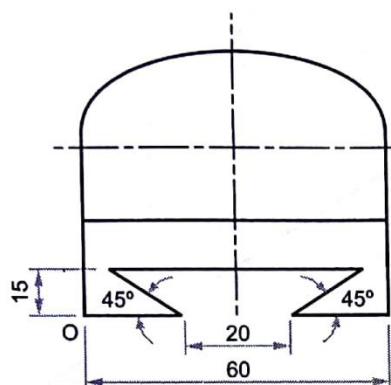
Problem 07: Draw isometric view from following orthographic views.



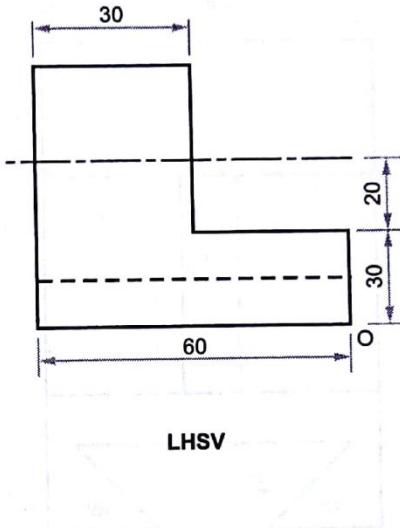
Solution:



Problem 08: Draw isometric view from following orthographic views.

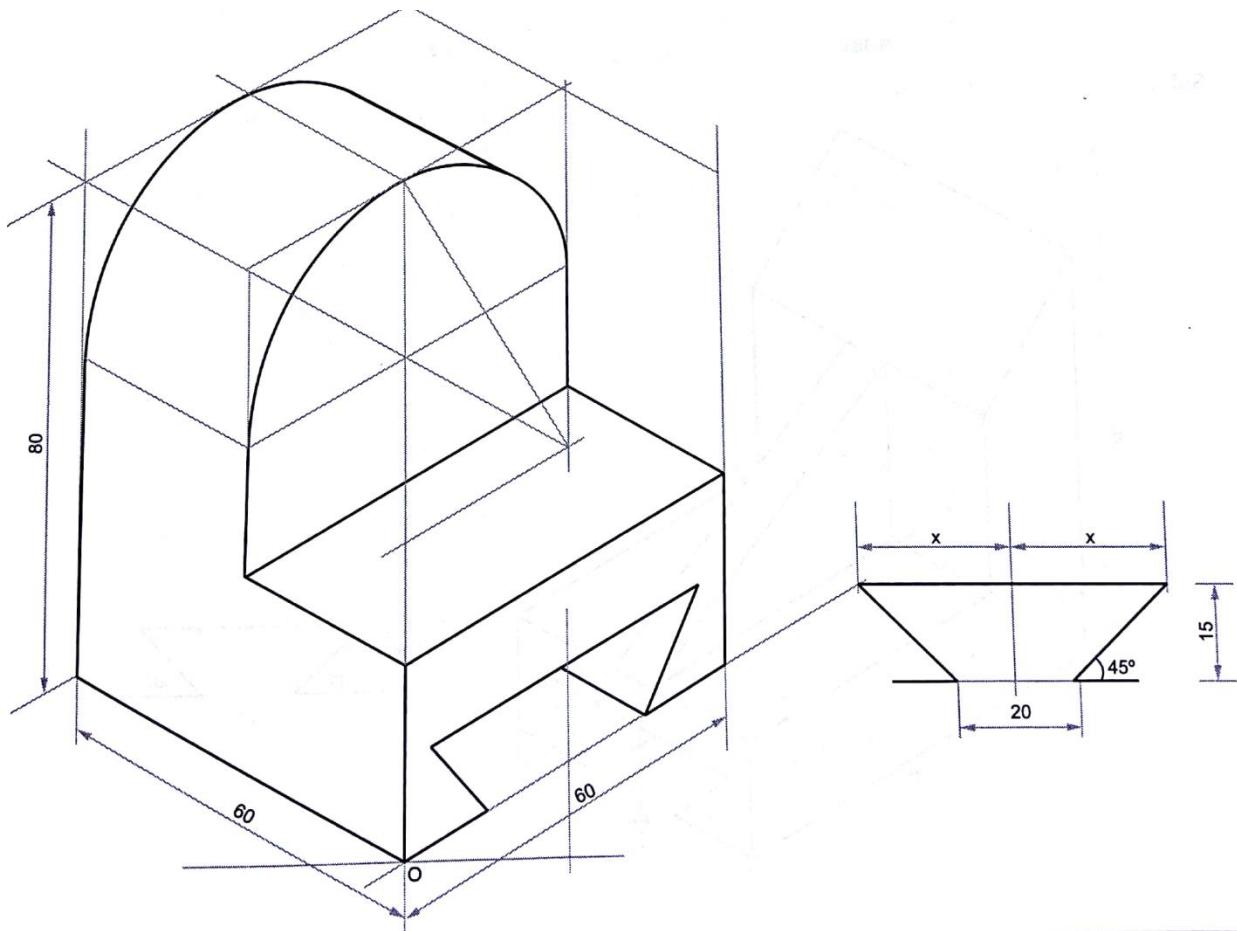


FV

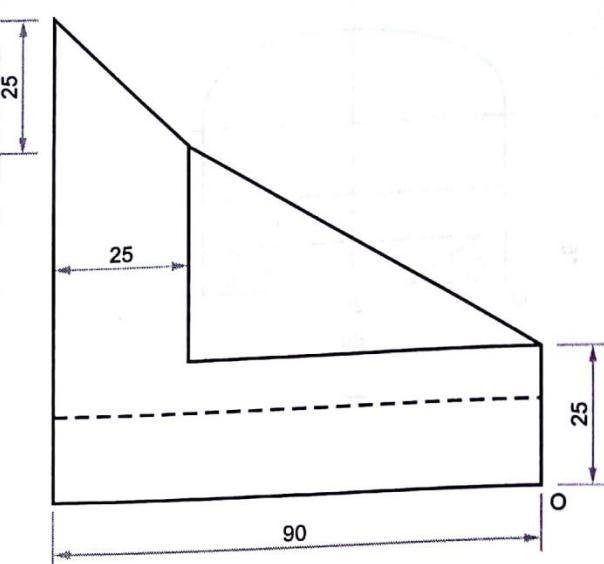
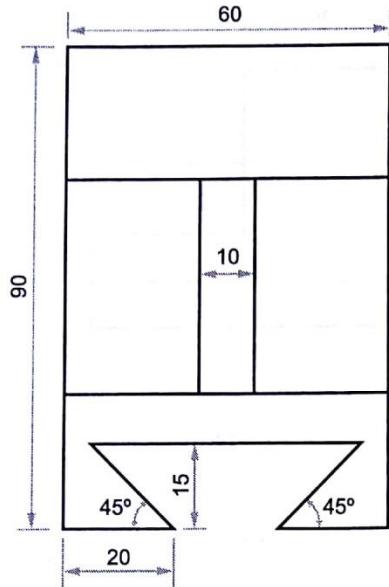


LHSV

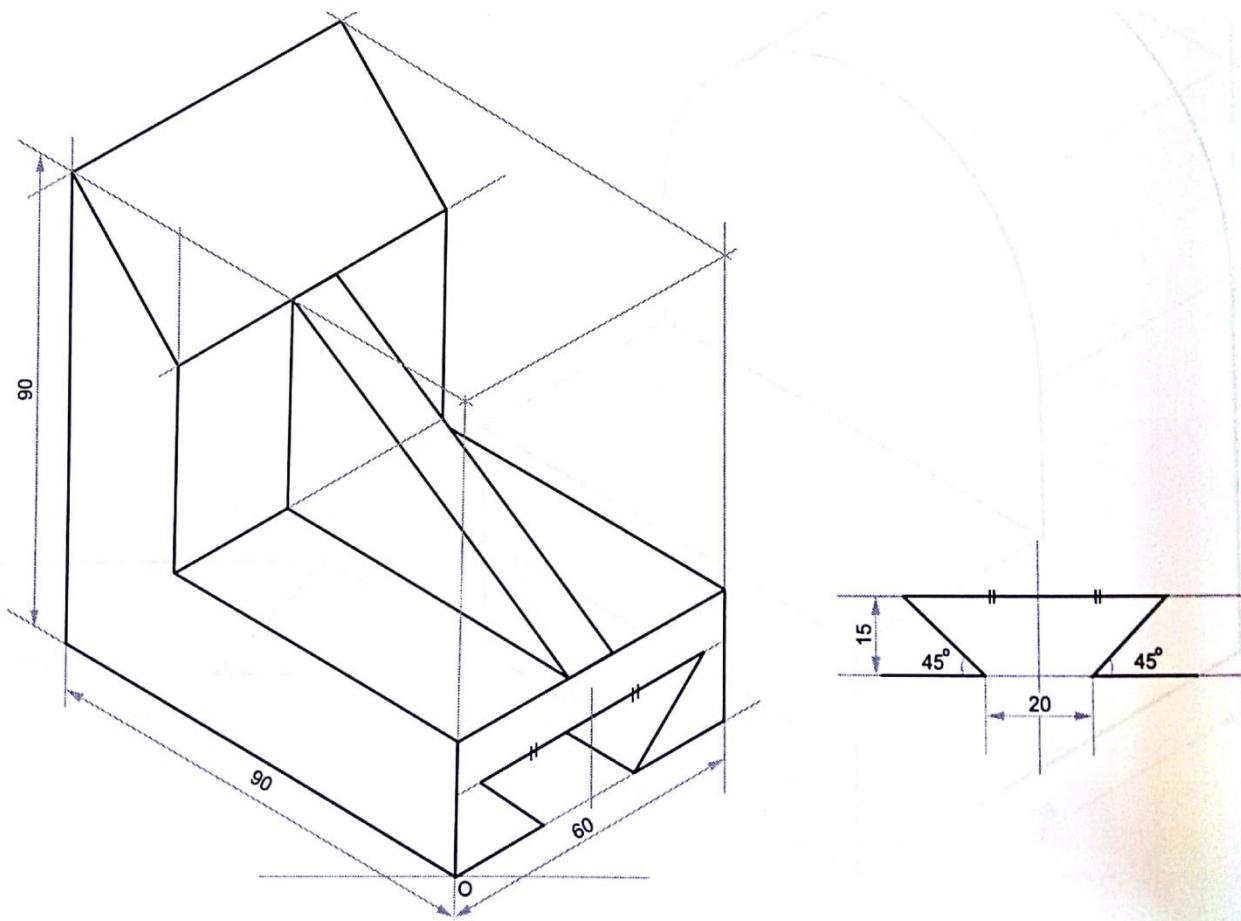
Solution:



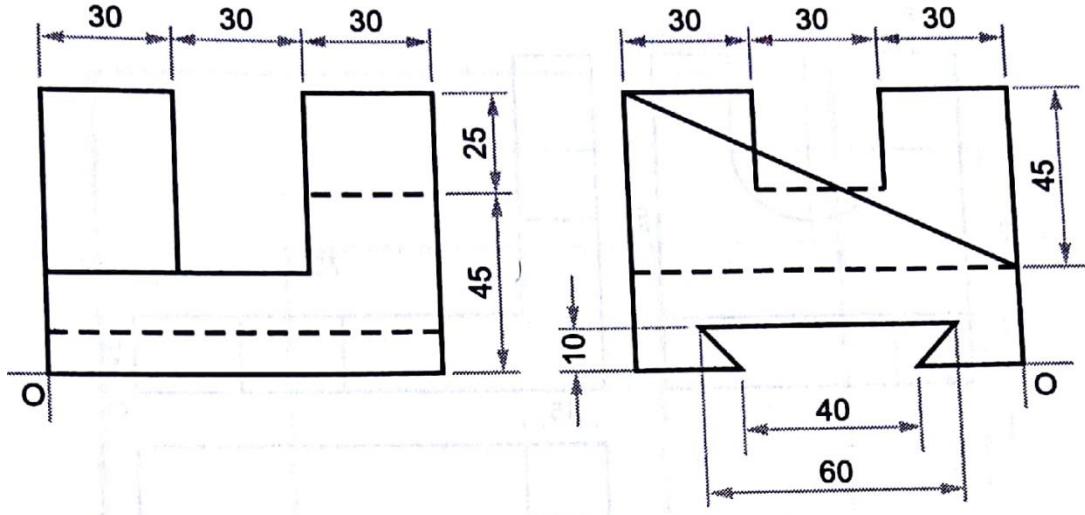
Problem 09: Draw isometric view from following orthographic views.



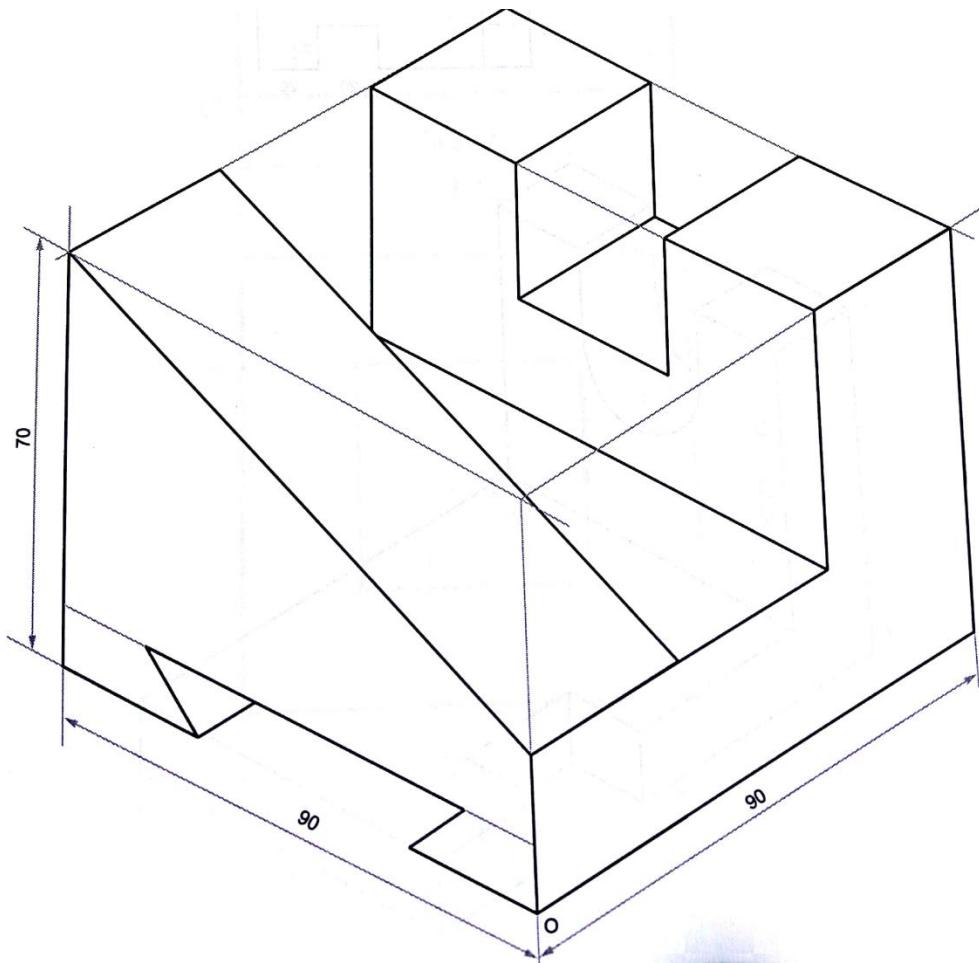
Solution:



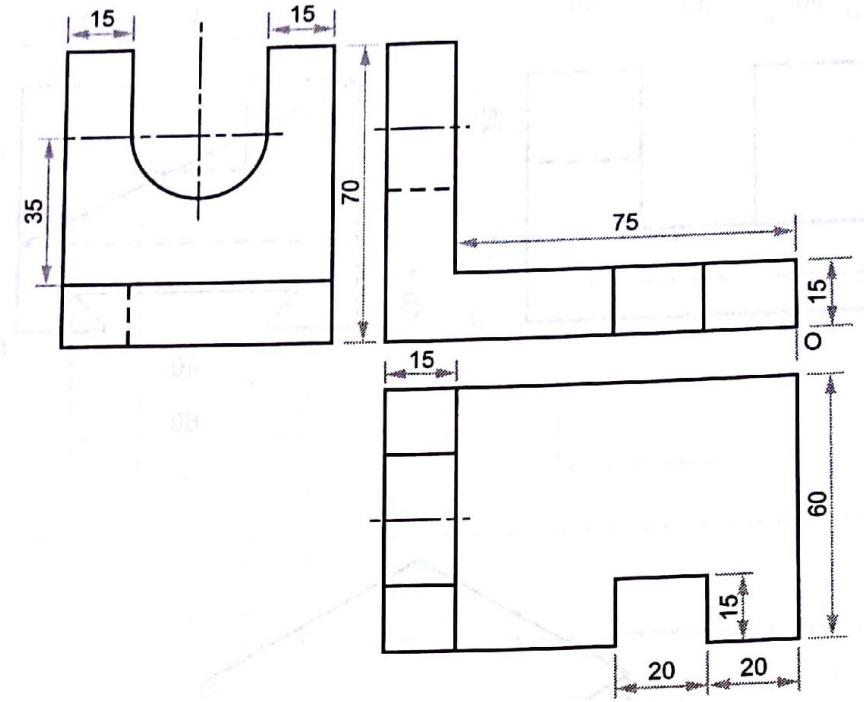
Problem 10: Draw isometric view from following orthographic views.



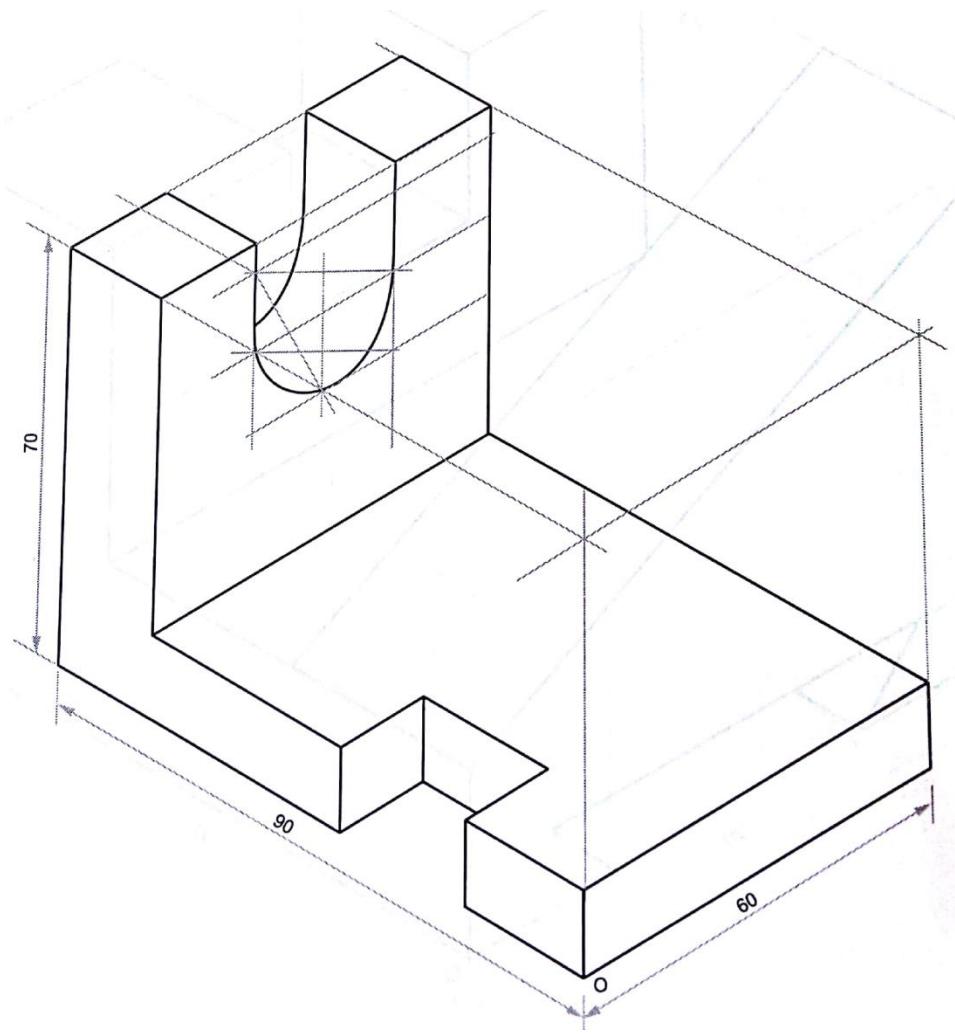
Solution:



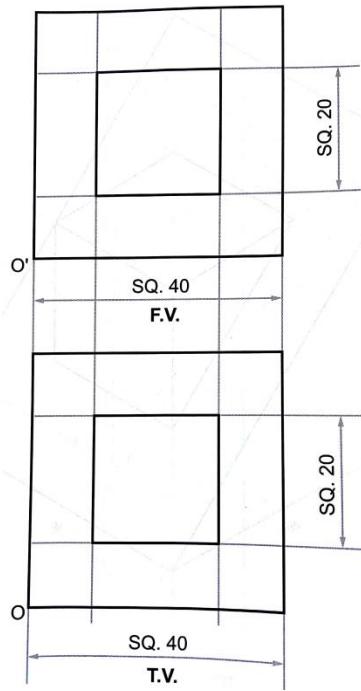
Problem 11: Draw isometric view from following orthographic views.



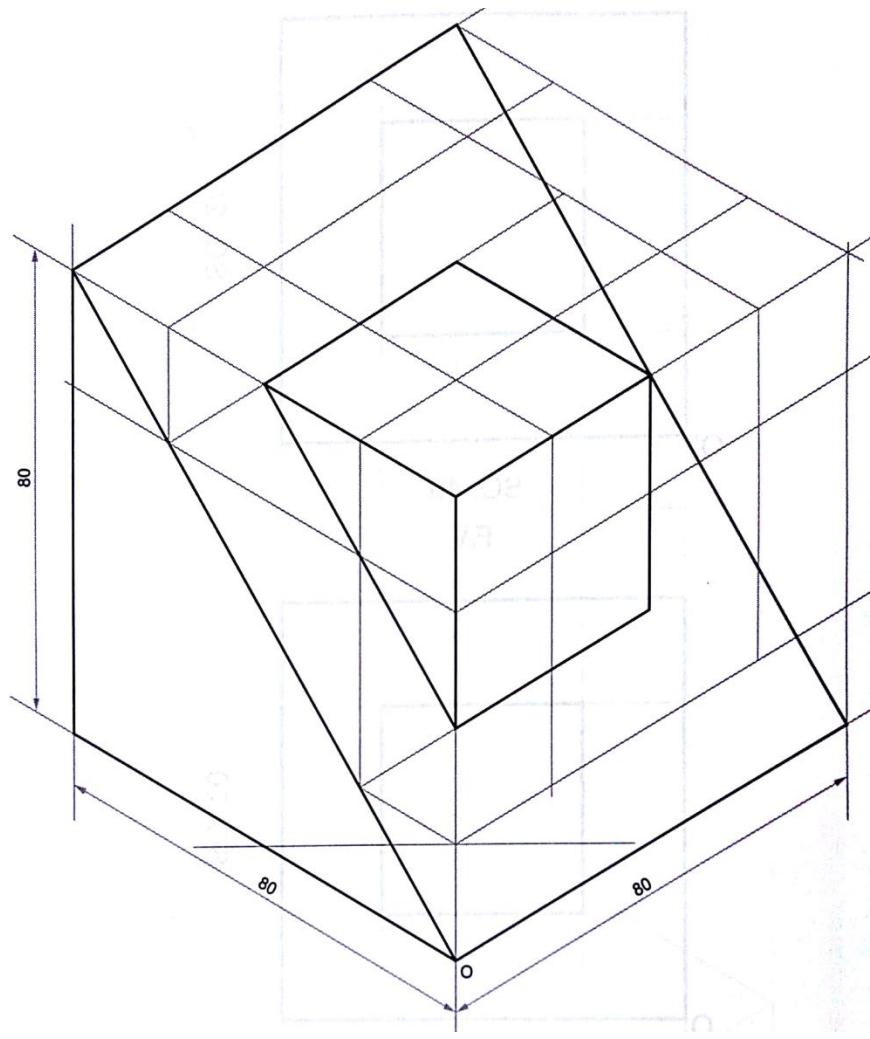
Solution:



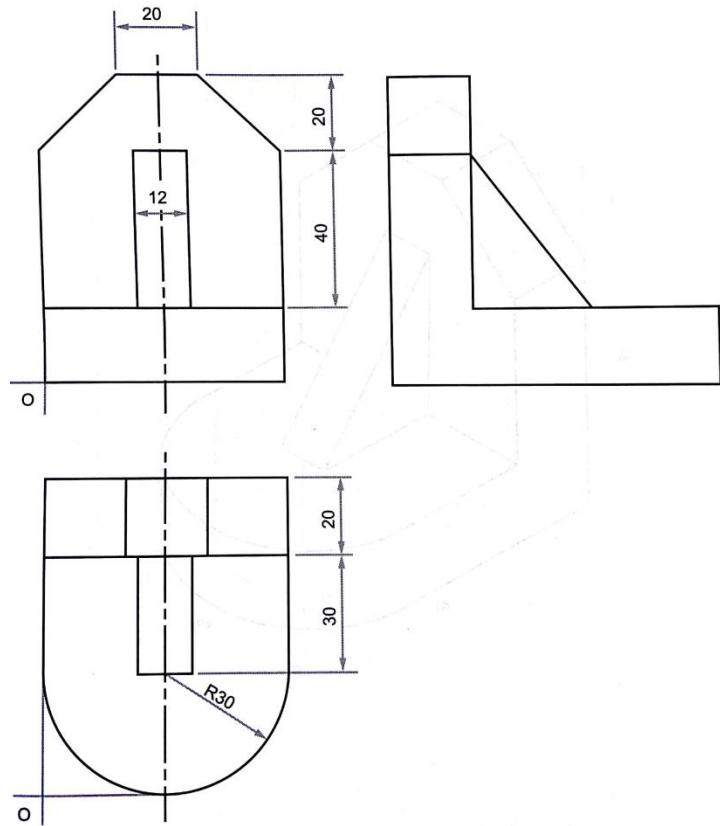
Problem 12: Draw isometric view from following orthographic views.



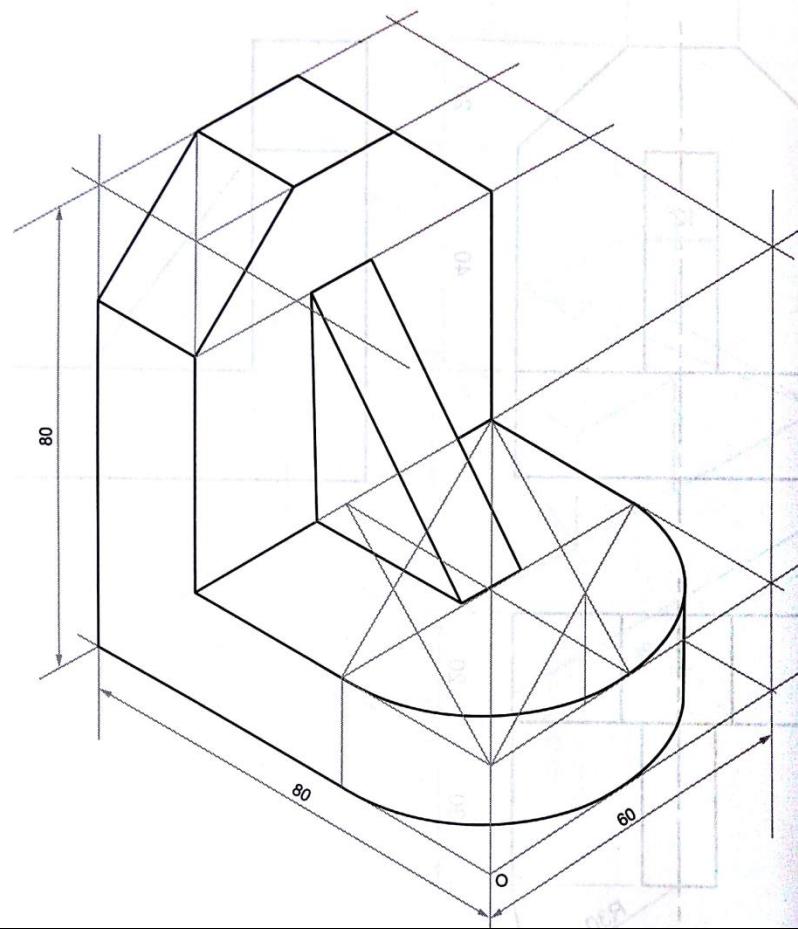
Solution:



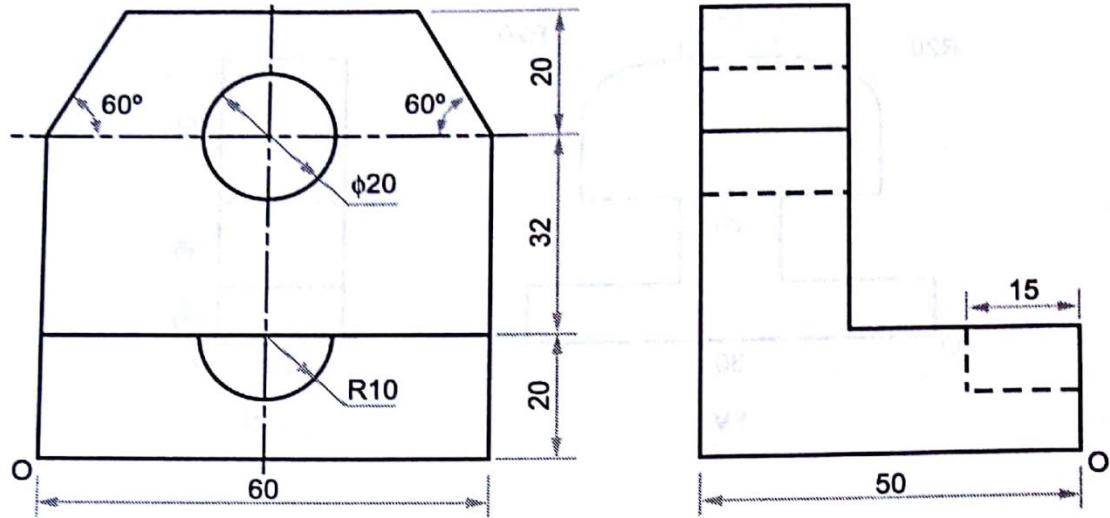
Problem 13: Draw isometric view from following orthographic views.



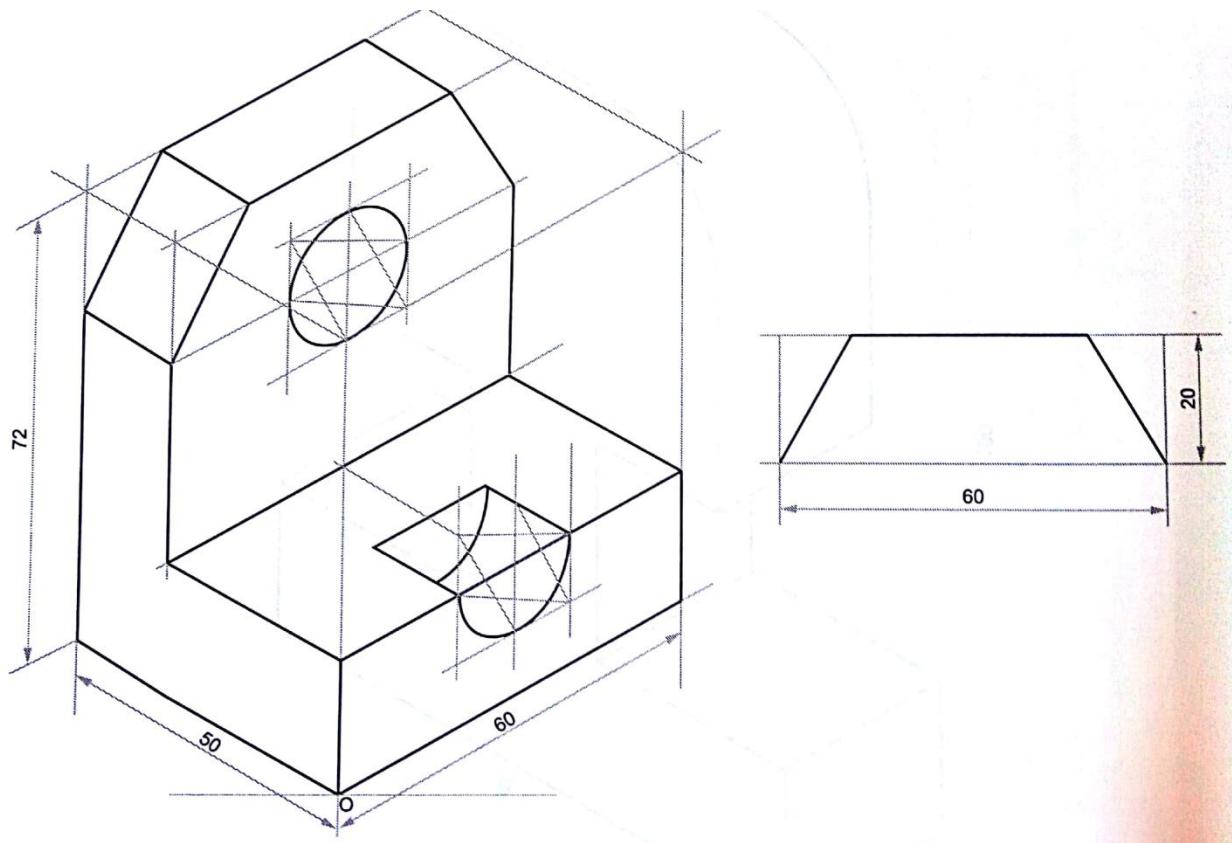
Solution:



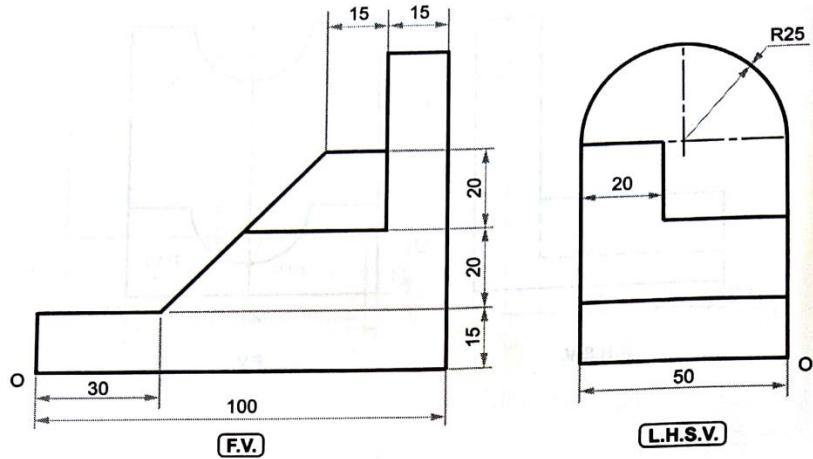
Problem 14: Draw isometric view from following orthographic views.



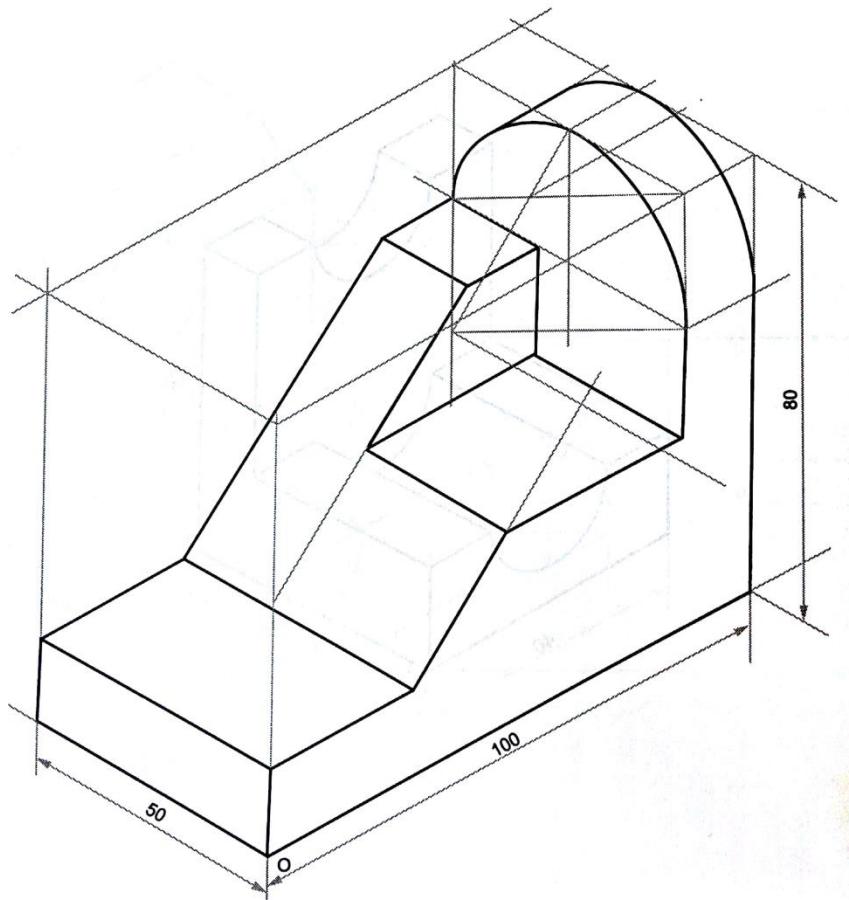
Solution:



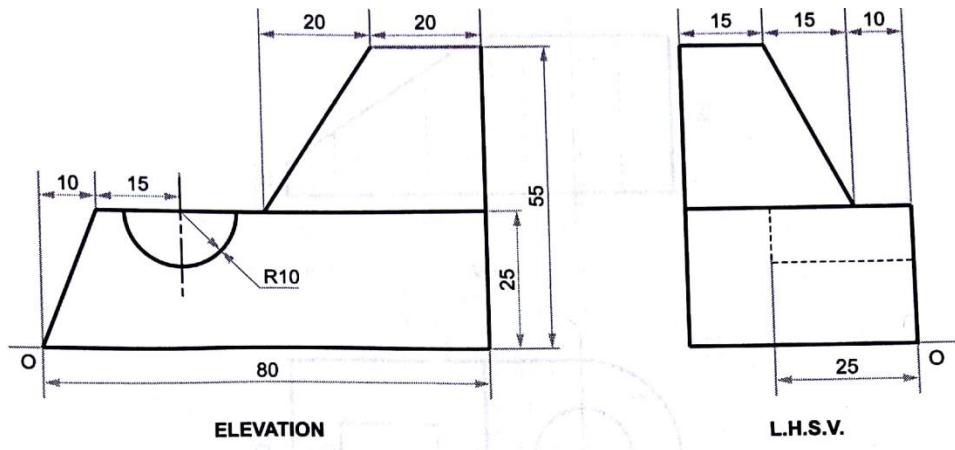
Problem 15: Draw isometric view from following orthographic views.



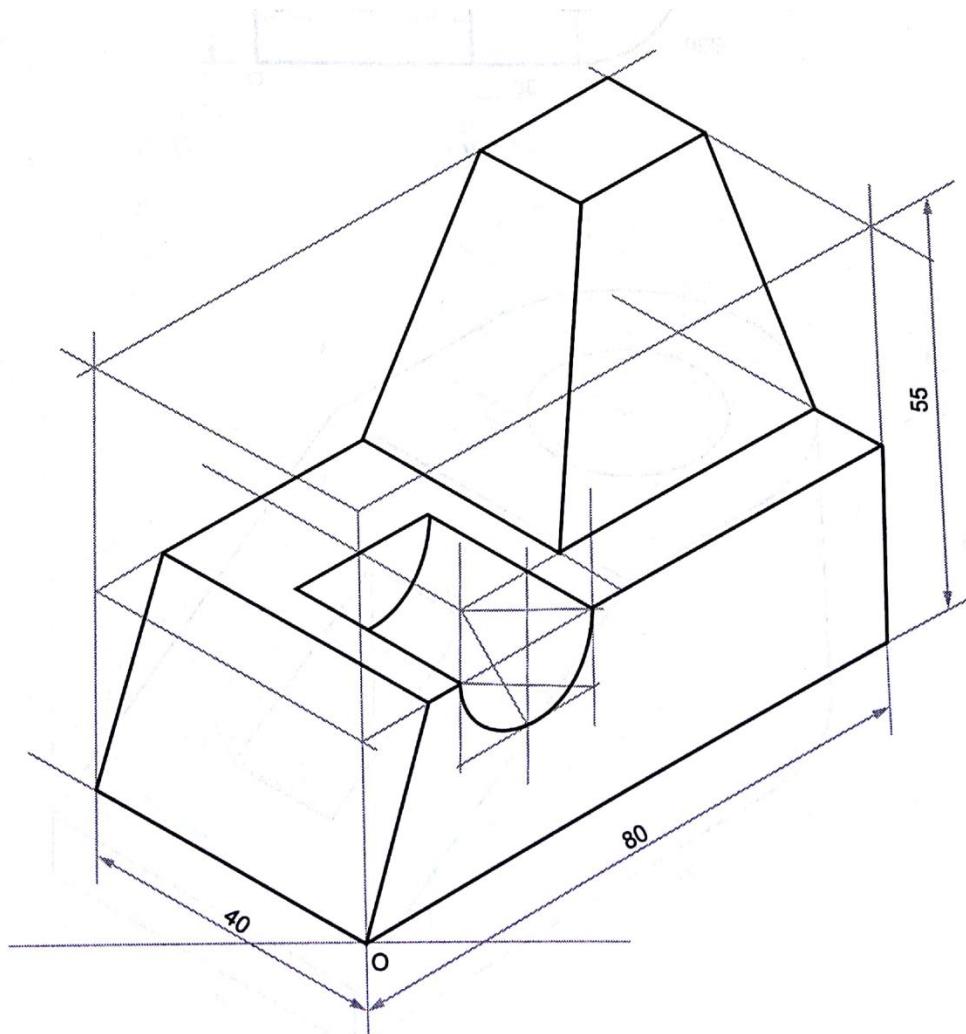
Solution:



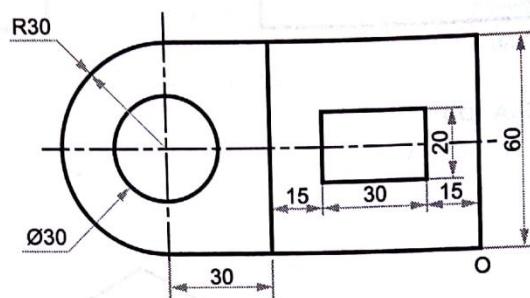
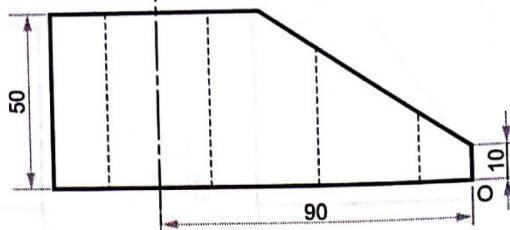
Problem 16: Draw isometric view from following orthographic views.



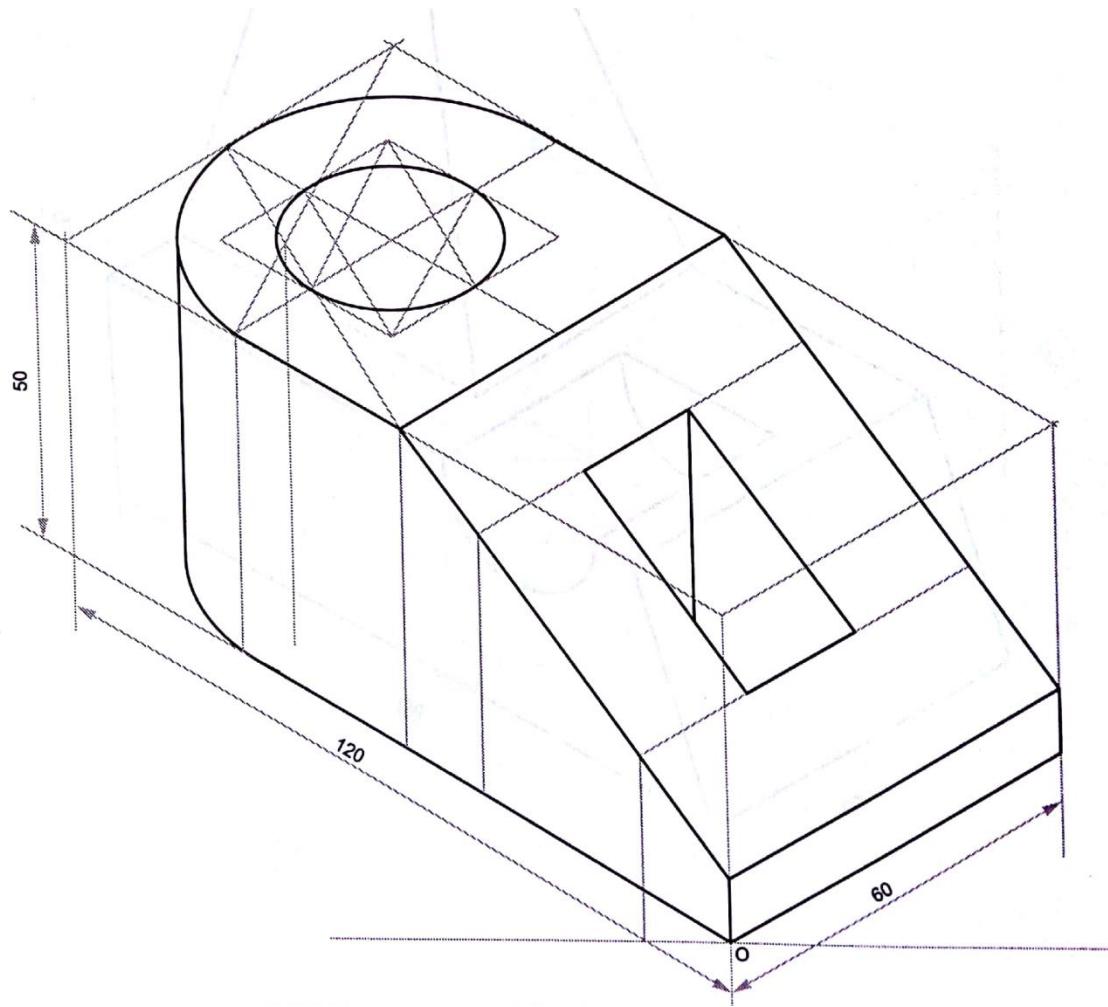
Solution:



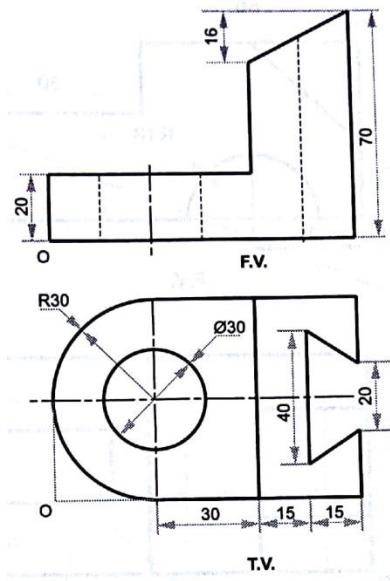
Problem 17: Draw isometric view from following orthographic views.



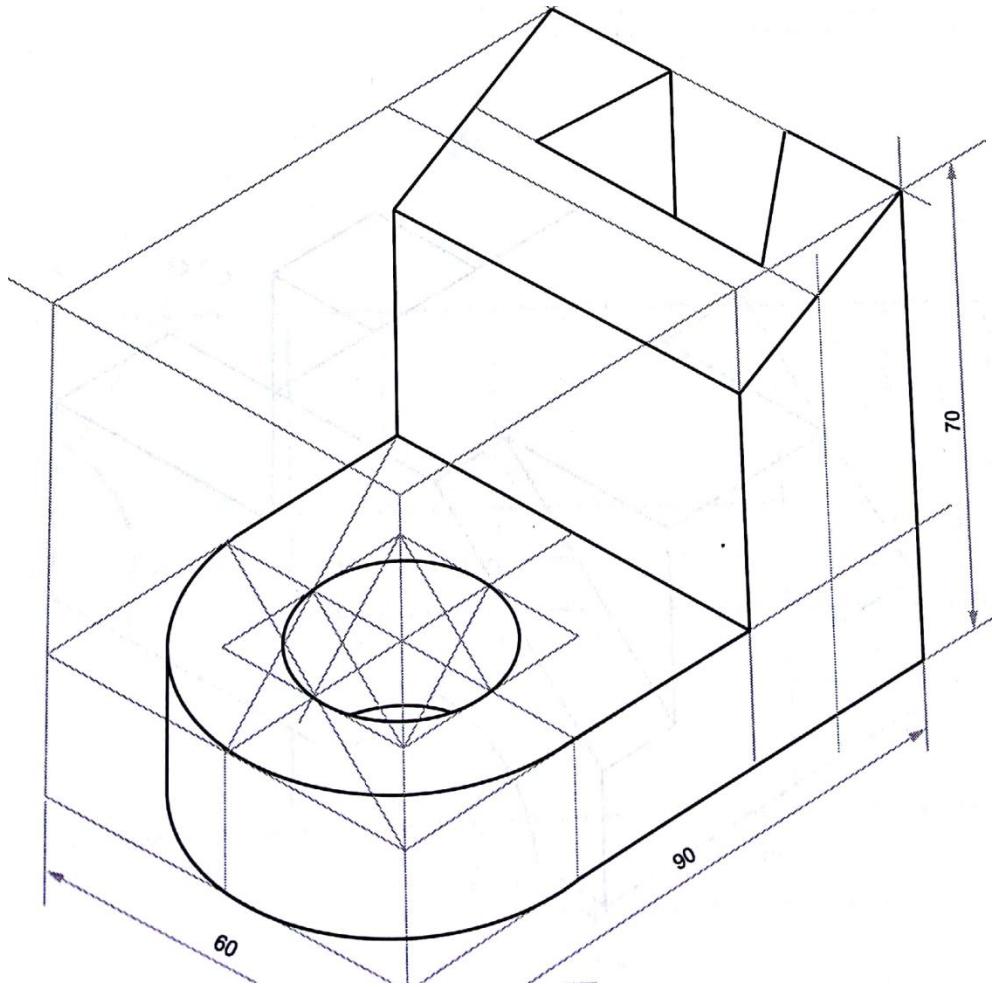
Solution:



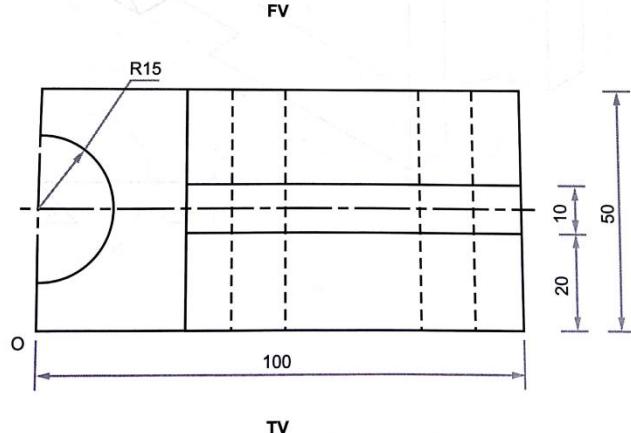
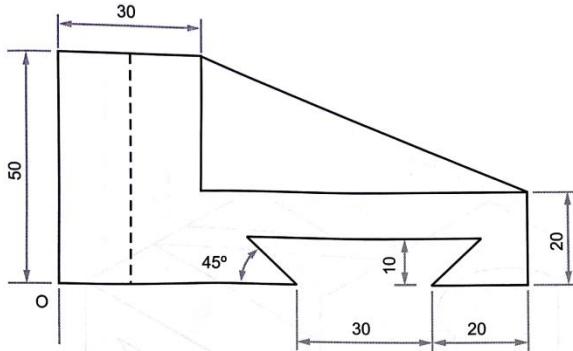
Problem 18: Draw isometric view from following orthographic views.



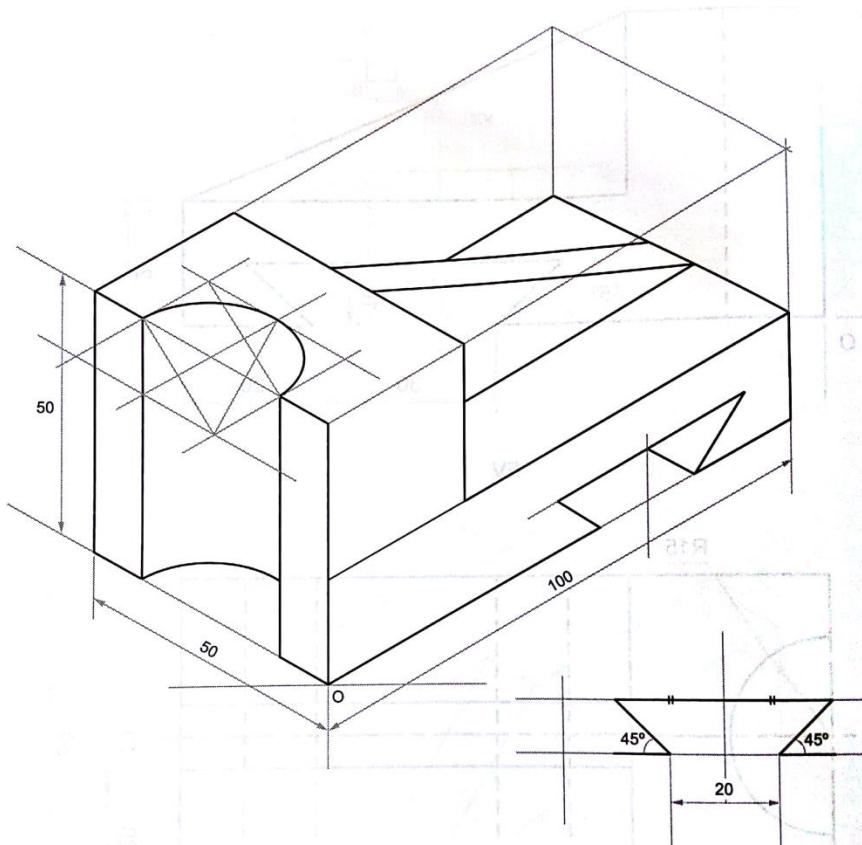
Solution:



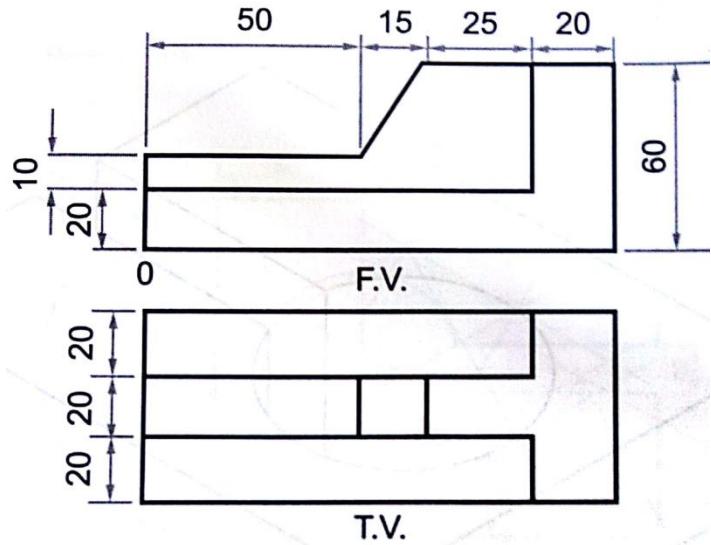
Problem 19: Draw isometric view from following orthographic views.



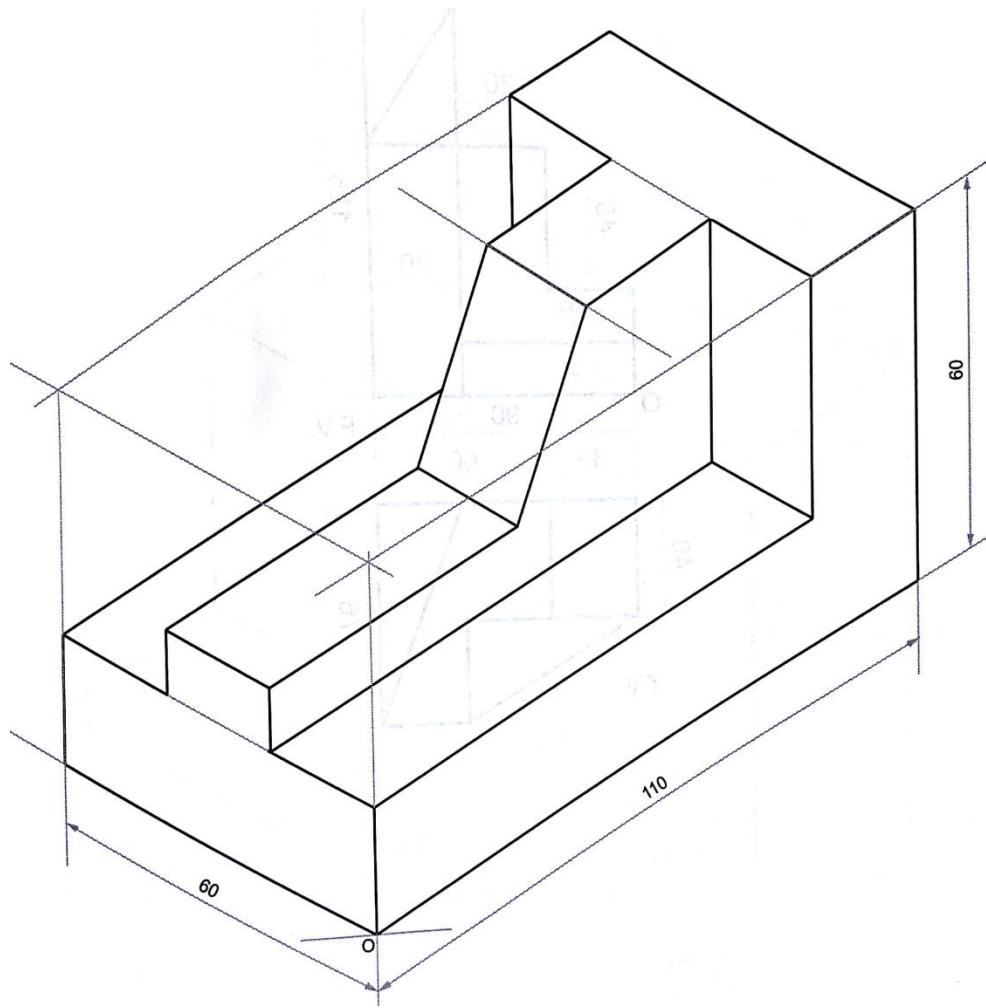
Solution:



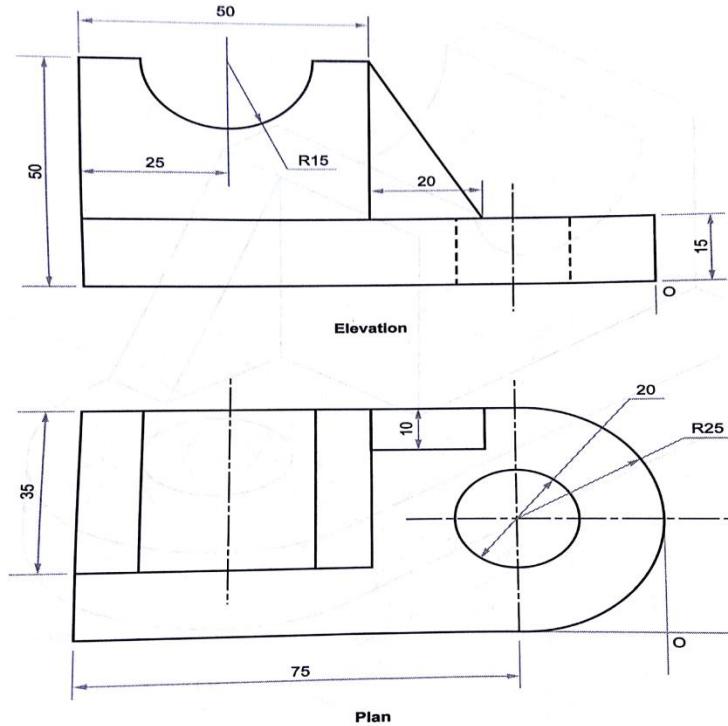
Problem 20: Draw isometric view from following orthographic views.



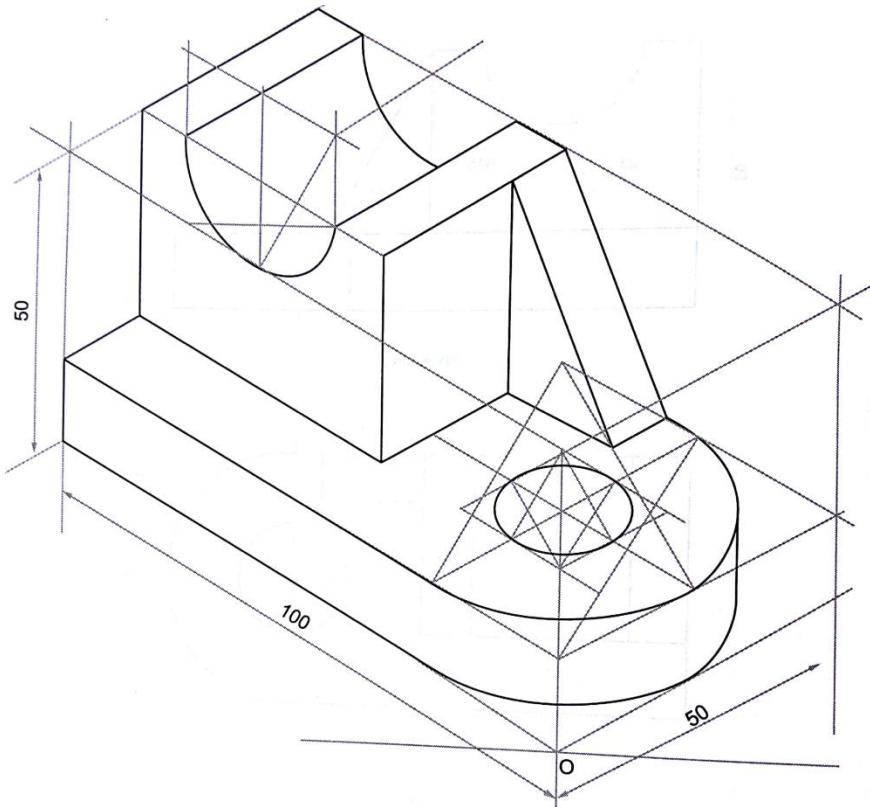
Solution:



Problem 21: Draw isometric view from following orthographic views.



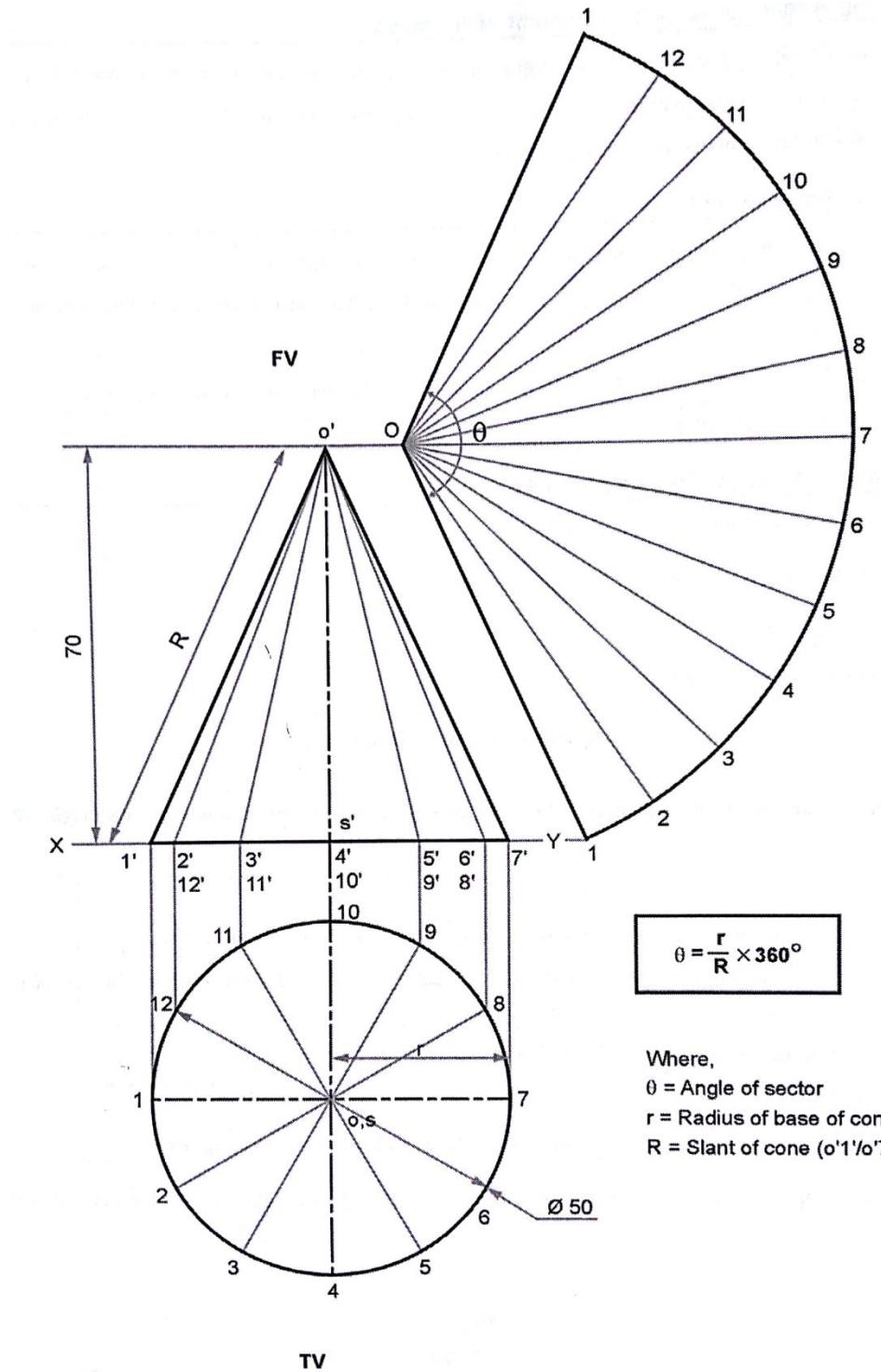
Solution:



UNIT VI: DEVELOPMENT OF LATERAL SURAFACES

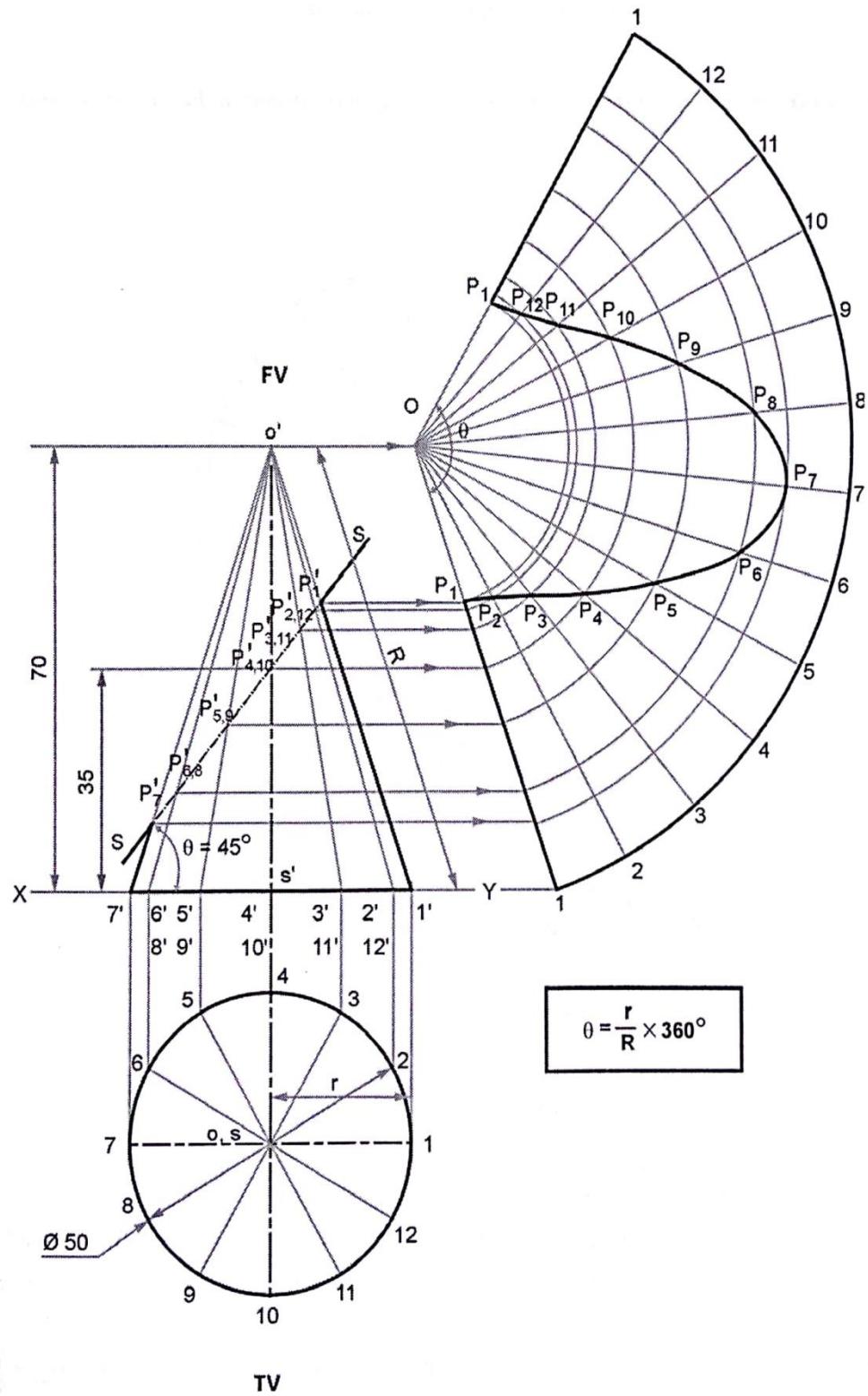
Problem 01: Draw the development of cone having base diameter 50 mm and axis height 70 mm.

Solution:



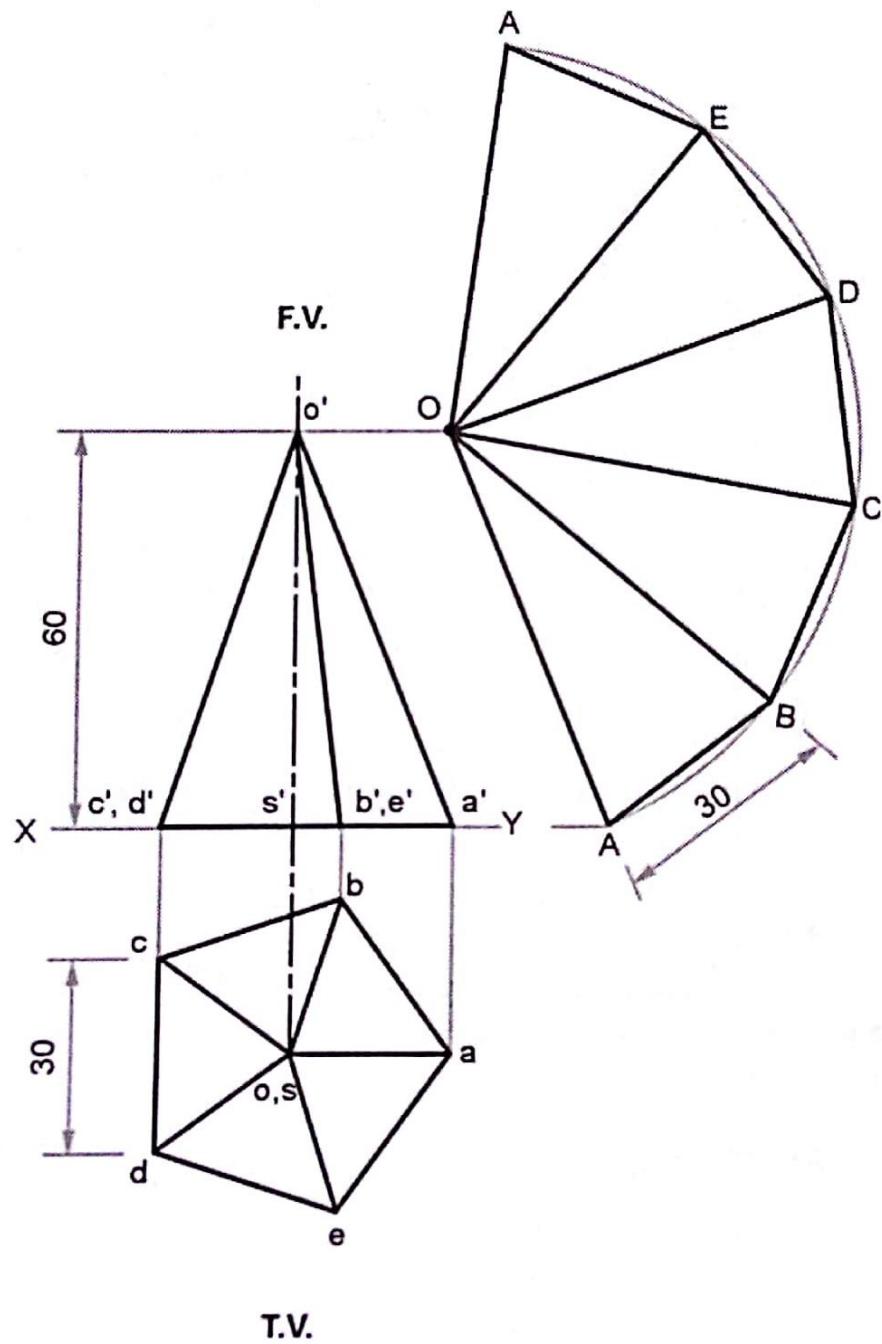
Problem 02: Draw the development of cone having base diameter 50 mm and axis height 70 mm. If its axis is cut by cutting plane which bisect the axis of the cone and inclined at 45^0 to H.P.

Solution:



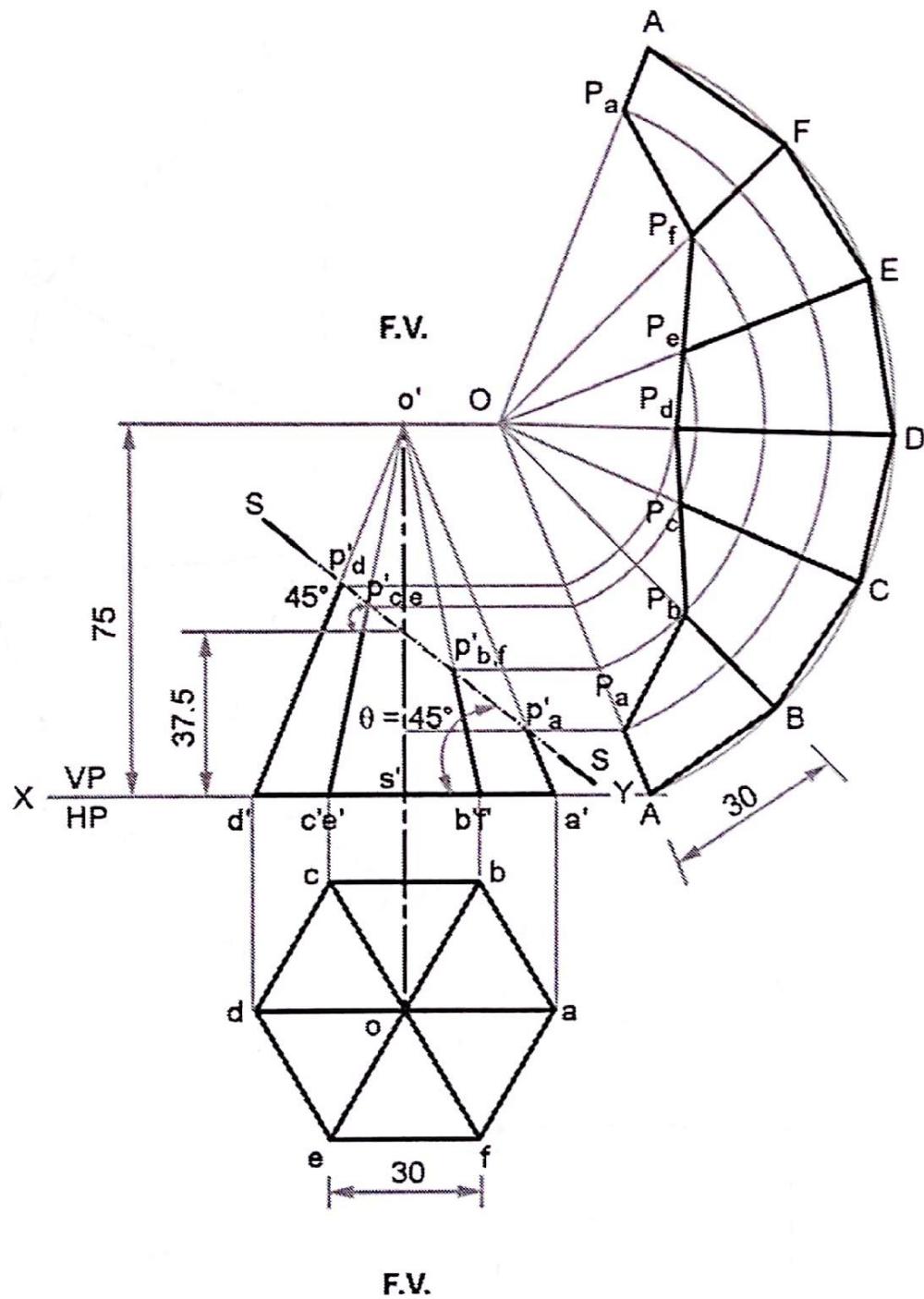
Problem 03: Draw the development of pentagonal pyramid having base side 30 mm & axis height 60 mm.

Solution:



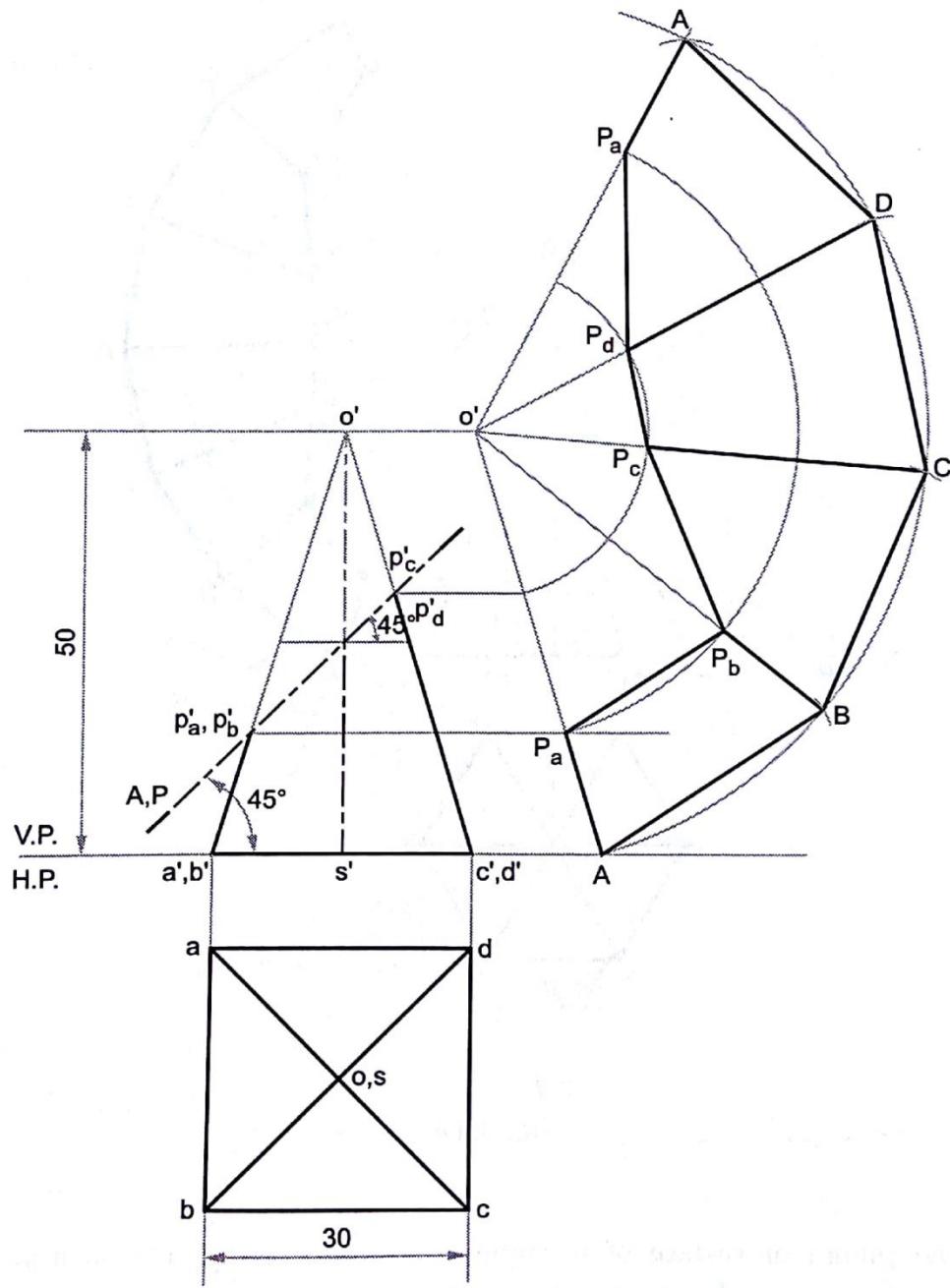
Problem 04: A hexagonal pyramid having base side 30 mm and axis height 75 mm is resting on H.P. with side of base parallel to V. P. It is cut by sectional Plane perpendicular to V. P. & inclined to H.P. at 45^0 and bisecting the axis. Draw its development.

Solution:



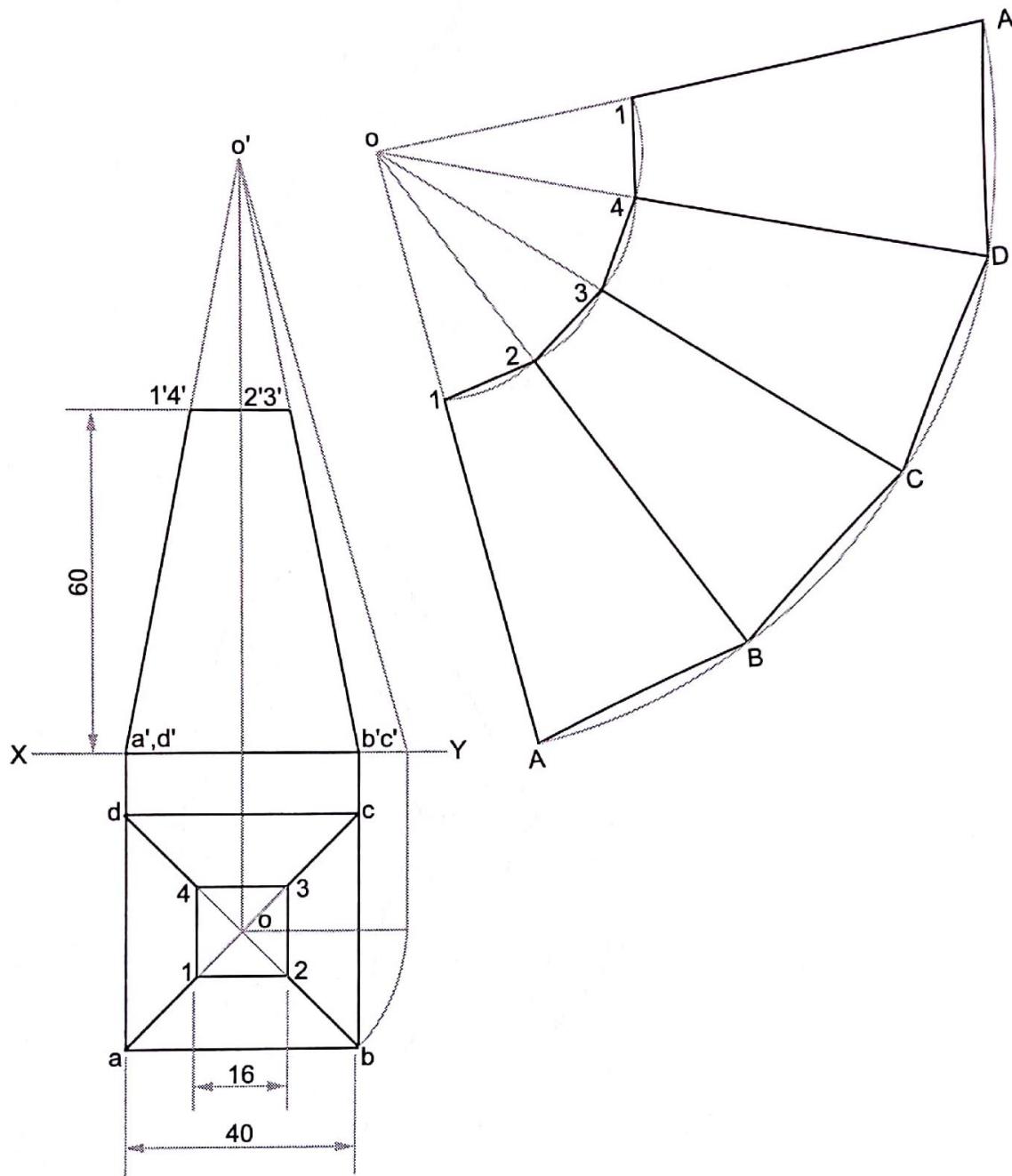
Problem 05: A square pyramid with side of base 30 mm and axis 50 mm long, is resting on its base on H.P. with an edge of base parallel to V.P. It is cut by a section plane, perpendicular to V.P. and inclined at 45° to H.P. The sectional plane passing through the midpoint of the axis. Draw the development of the surface of the cut pyramid.

Solution:

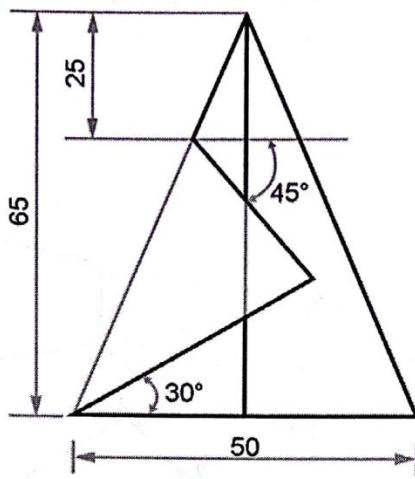


Problem 06: A frustum of square pyramid has its base 40 mm side, top 16 mm side and height 60 mm, its axis is vertical and side of base is parallel to vp. Draw the projection of frustum and show development of the lateral surfaces of it.

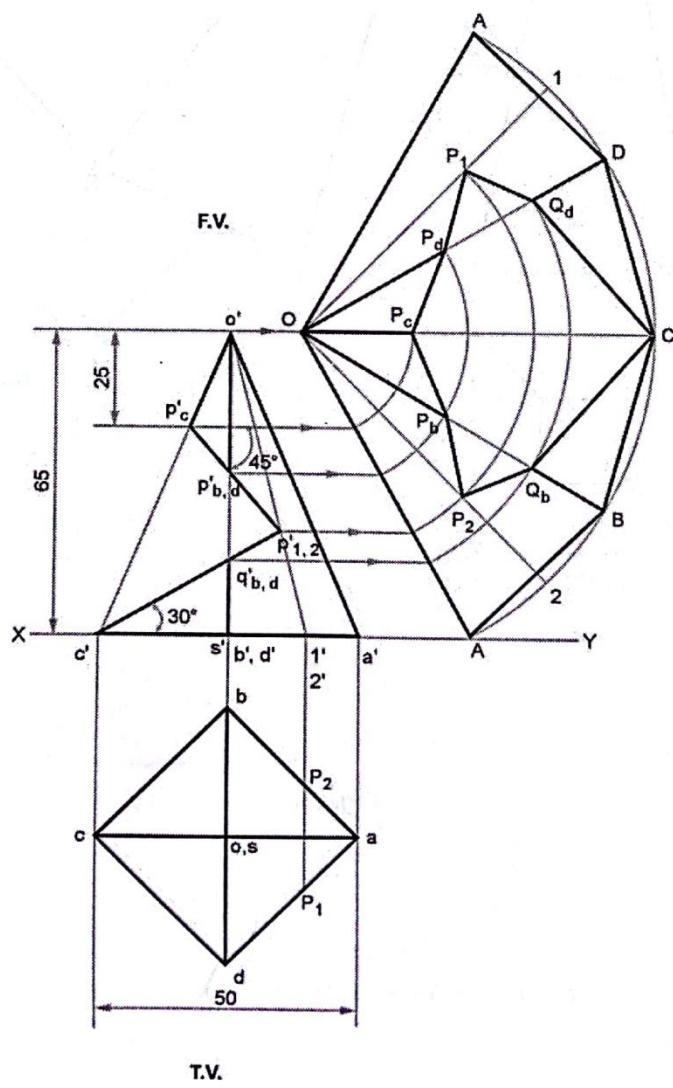
Solution:



Problem 10: Figure shows the development of square pyramid. Draw development of its lateral surfaces and its top view.

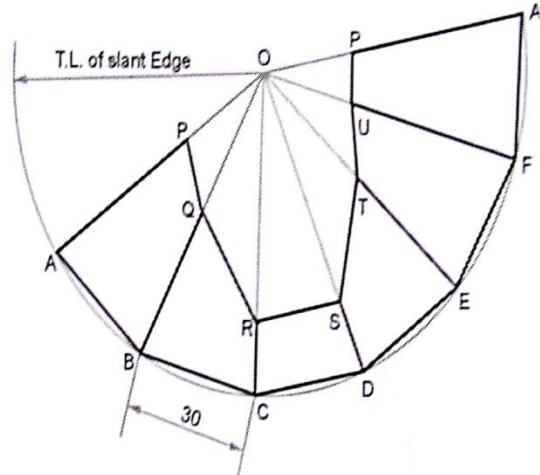
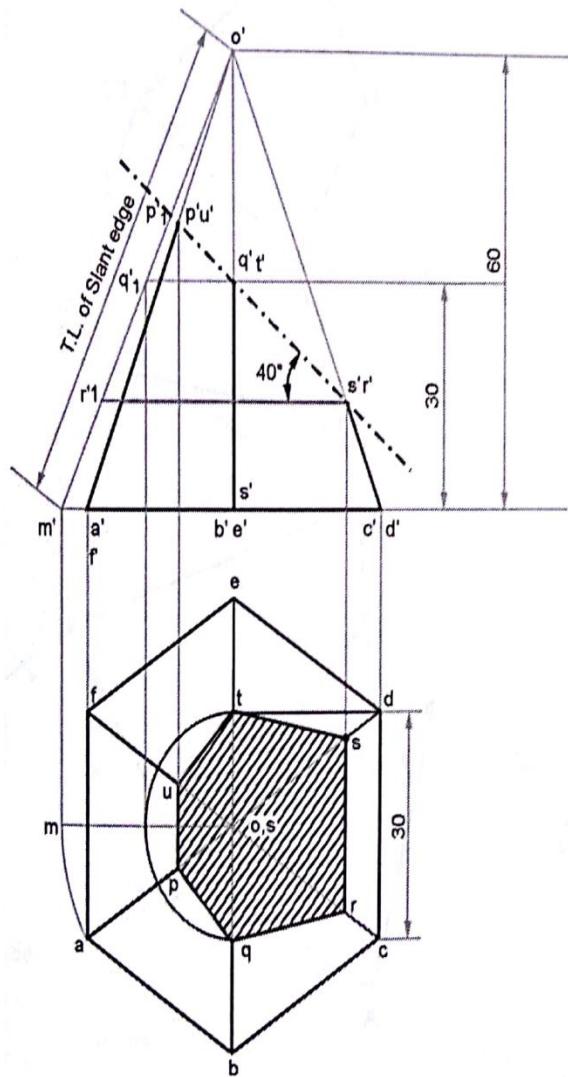


Solution:



Problem 11: A hexagonal pyramid of side of base 30 mm and height 60 mm is resting vertically on its base on HP such that two of the side of the base are perpendicular to VP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surface of the truncated pyramid.

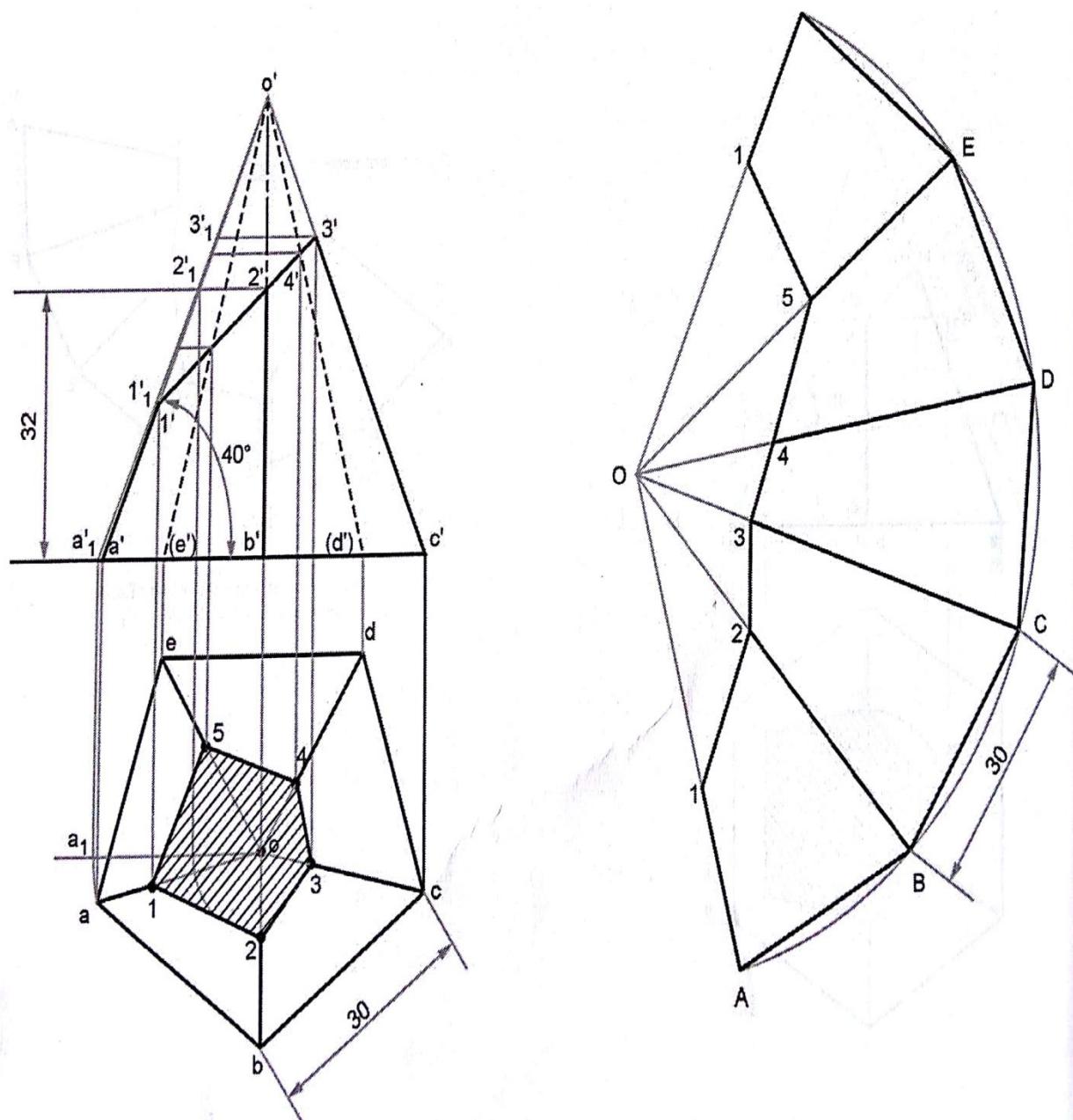
Solution:



$$\begin{aligned} OA &= o'm' = \text{True Length of Slant Edge} \\ OP &= o'p'_1, OQ = o'q'_1, OR = o'r'_1 \end{aligned}$$

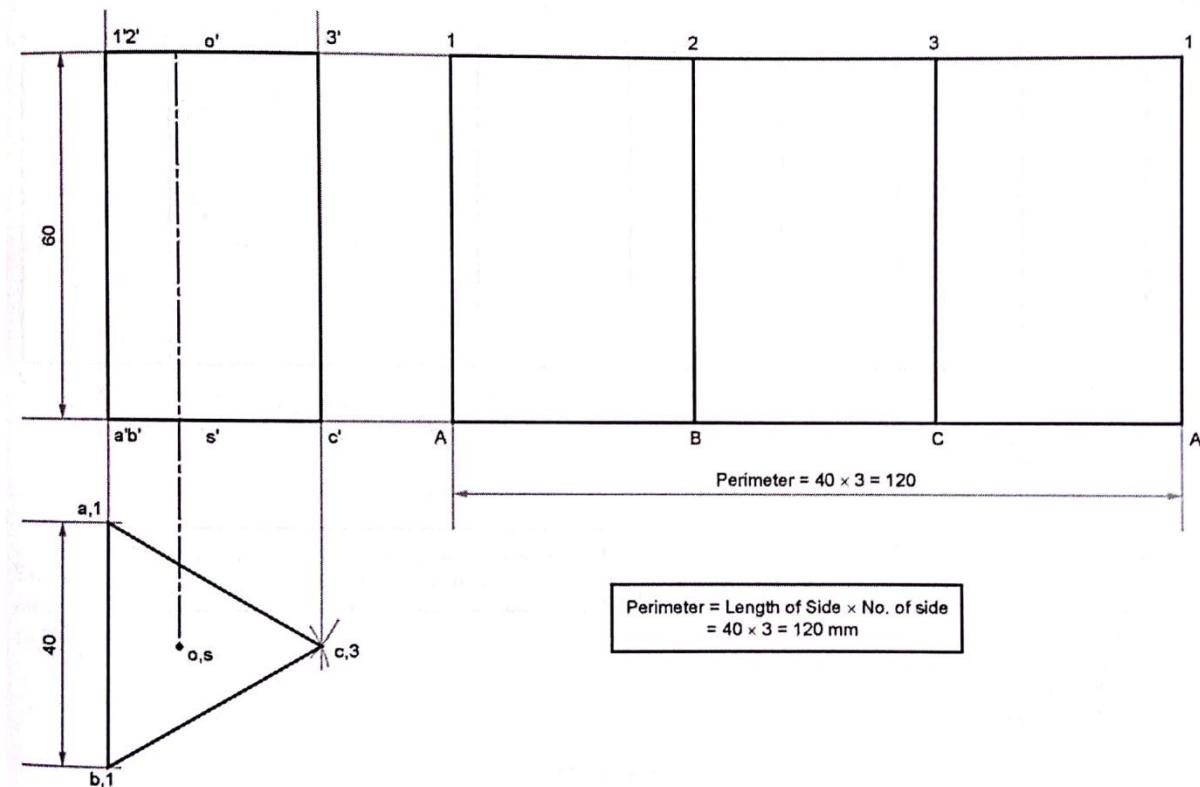
Problem 12: A pentagonal pyramid, side of base 30 mm and height 52 mm, stand with its base on HP and an edge of the base is parallel to VP and nearer to it. IT is cut by a plane perpendicular to VP. Inclined at 40^0 to HP and passing through a point on the axis, 32 mm above the base. Draw the sectional Top View. Develop the lateral surface of the truncated pyramid.

Solution:



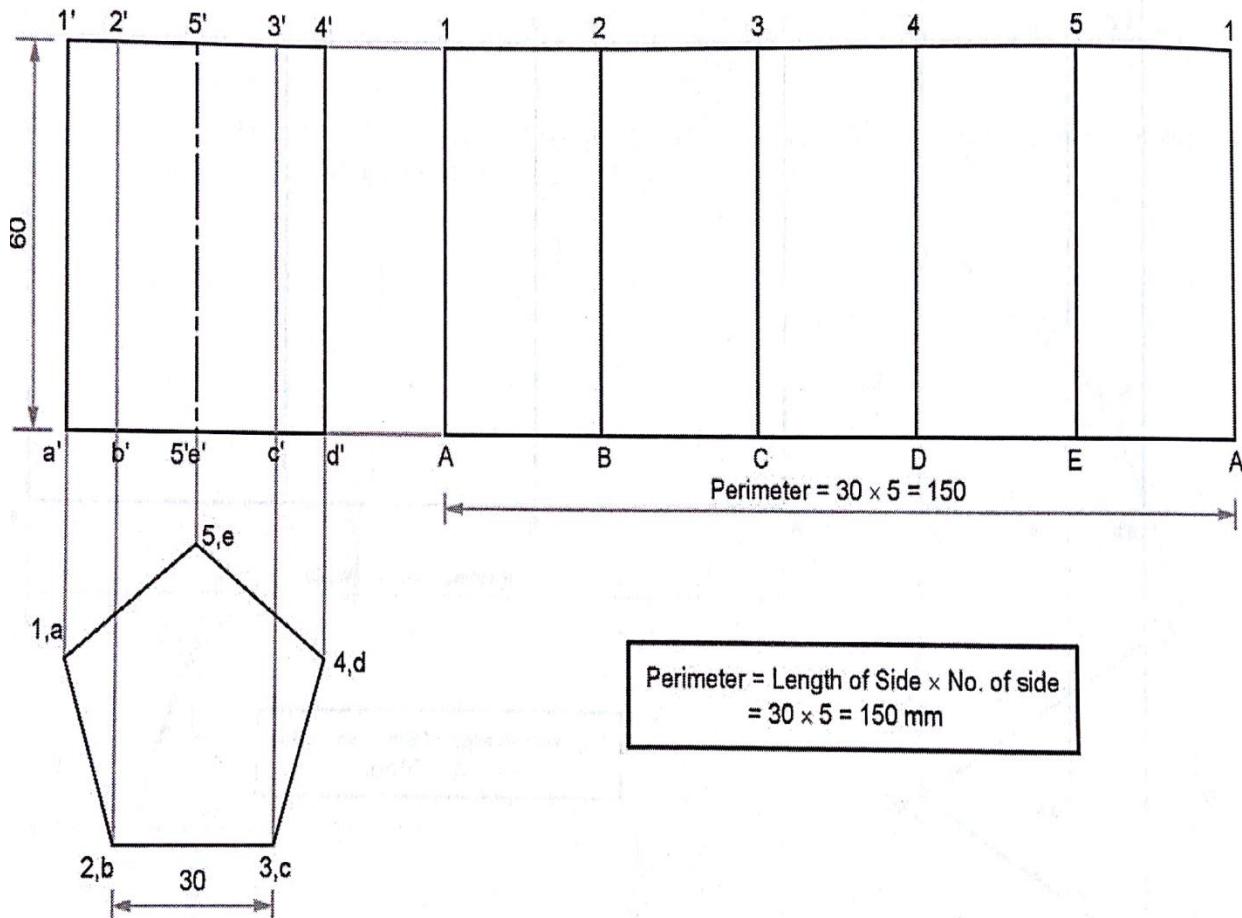
Problem 13: Draw the development of lateral surfaces of triangular prism of base side 40 mm and axis height 60 mm.

Solution:



Problem 14: A pentagonal prism side of base 30 mm and axis 60 mm has its base side parallel to VP and nearer to observer. Draw development of lateral surfaces.

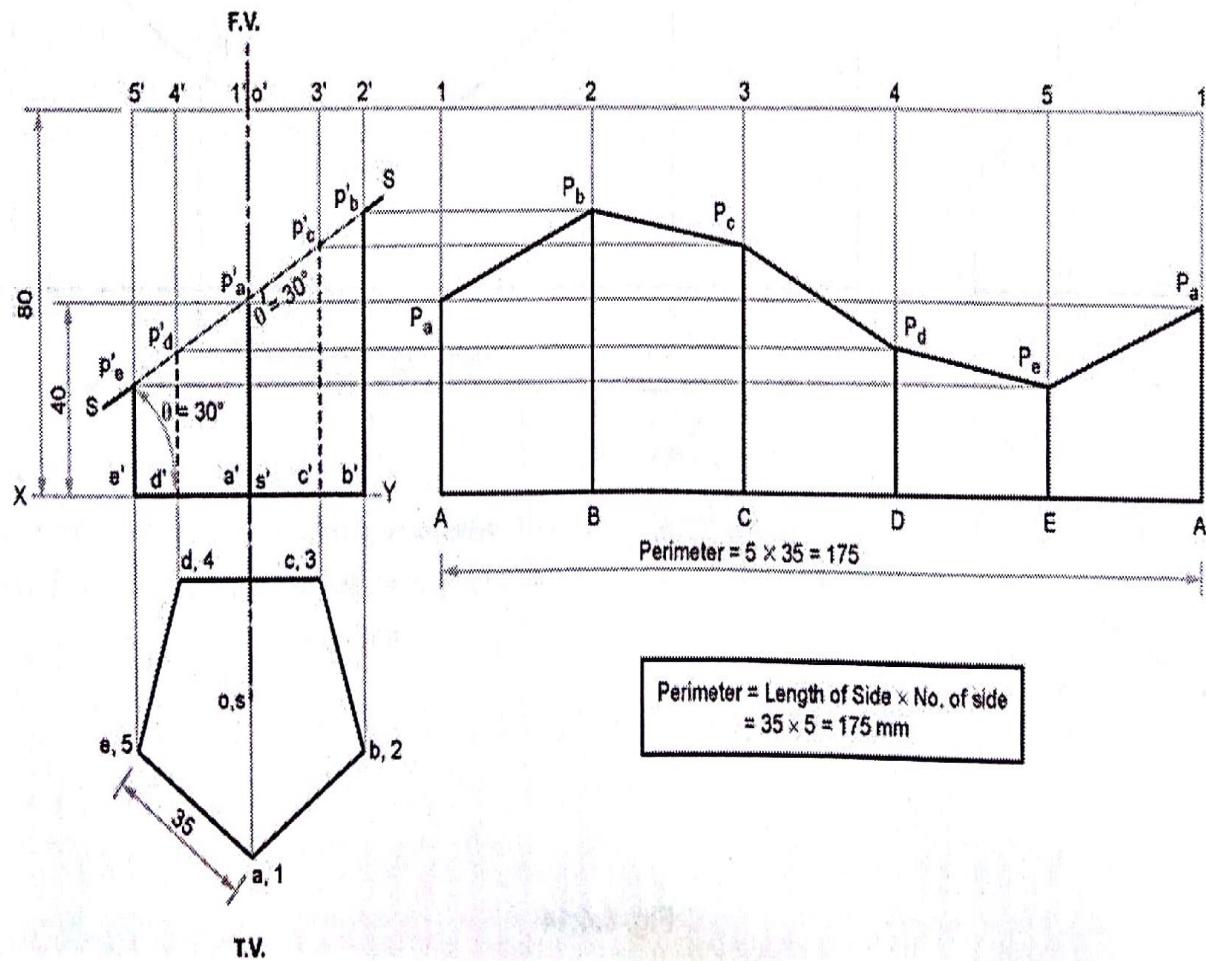
Solution:



Problem 15:

Draw the development of surface of pentagonal prism having side 35 mm and axis height 80 mm, rest on H.P. on its base with an edge of base parallel to V.P. when it is cut by a cutting plane which is inclined at 30° to the HP and bisecting the axis of prism.

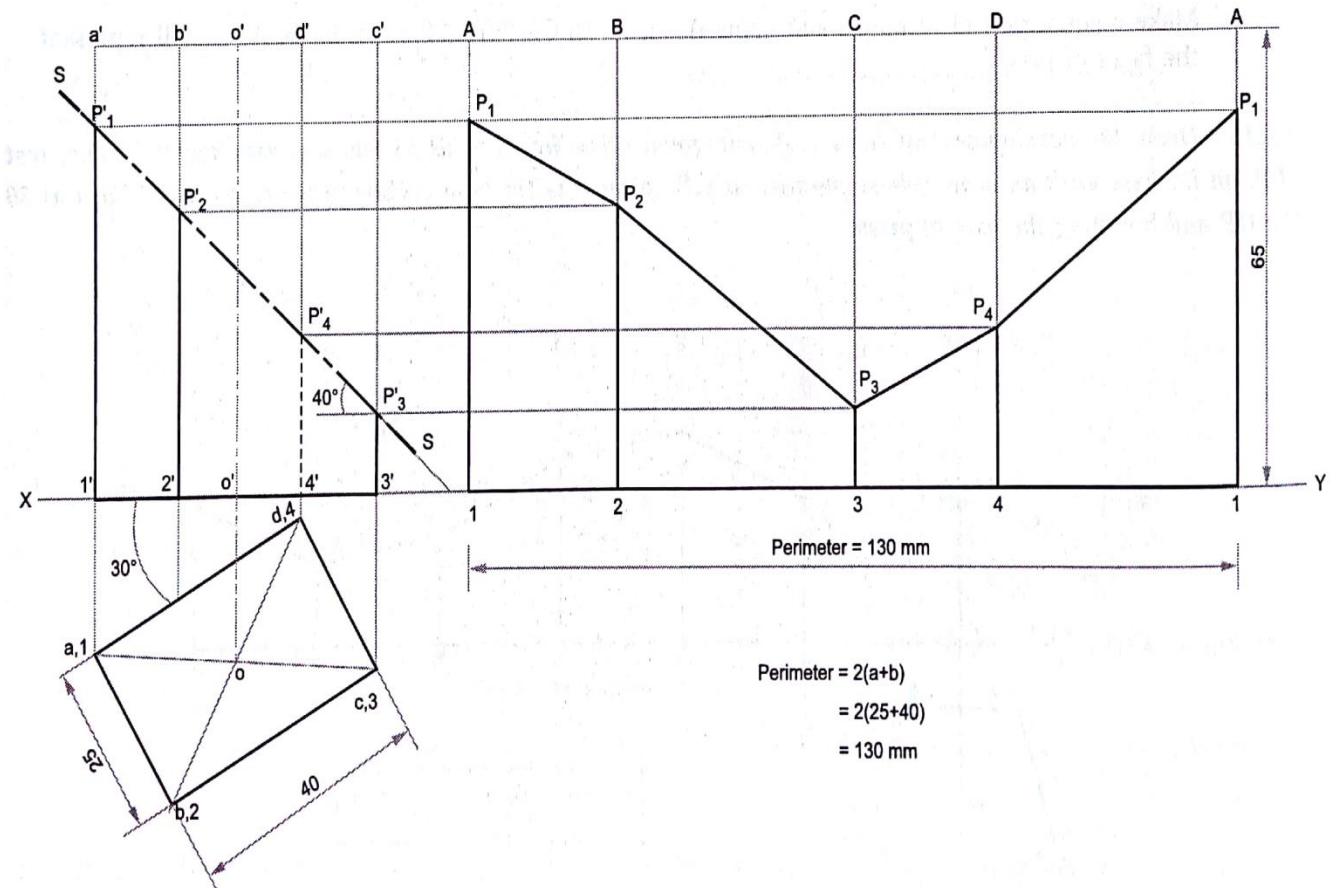
Solution:



Problem 16:

A rectangular prism of base $40 \text{ mm} \times 25 \text{ mm}$ and height 65 mm rests on HP on its base with the longer side of base inclined at 30° to VP. It is cut by a plane inclined at 40° to HP, perpendicular to VP cuts the axis at its mid height. Draw the development of the remaining portion of the prism.

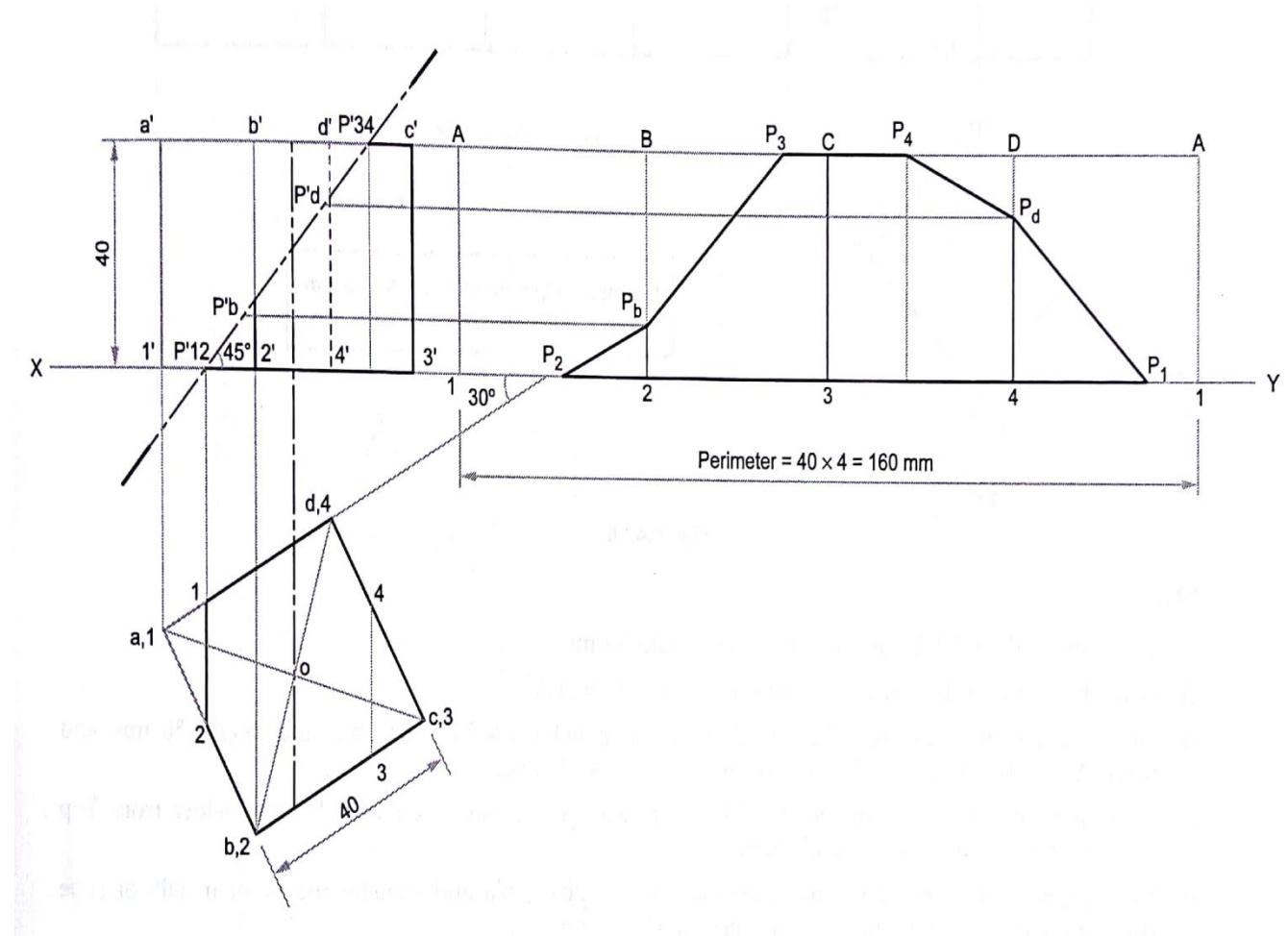
Solution:



Problem 17:

A cube of side 40 mm is resting on HP with its base on HP such that one of its vertical faces is inclined at 30° to the VP. It is cut by a section plane perpendicular to VP, inclined to HP at an angle 45° and passes through the midpoint of the axis. Draw the development of the lower lateral surface of the cube.

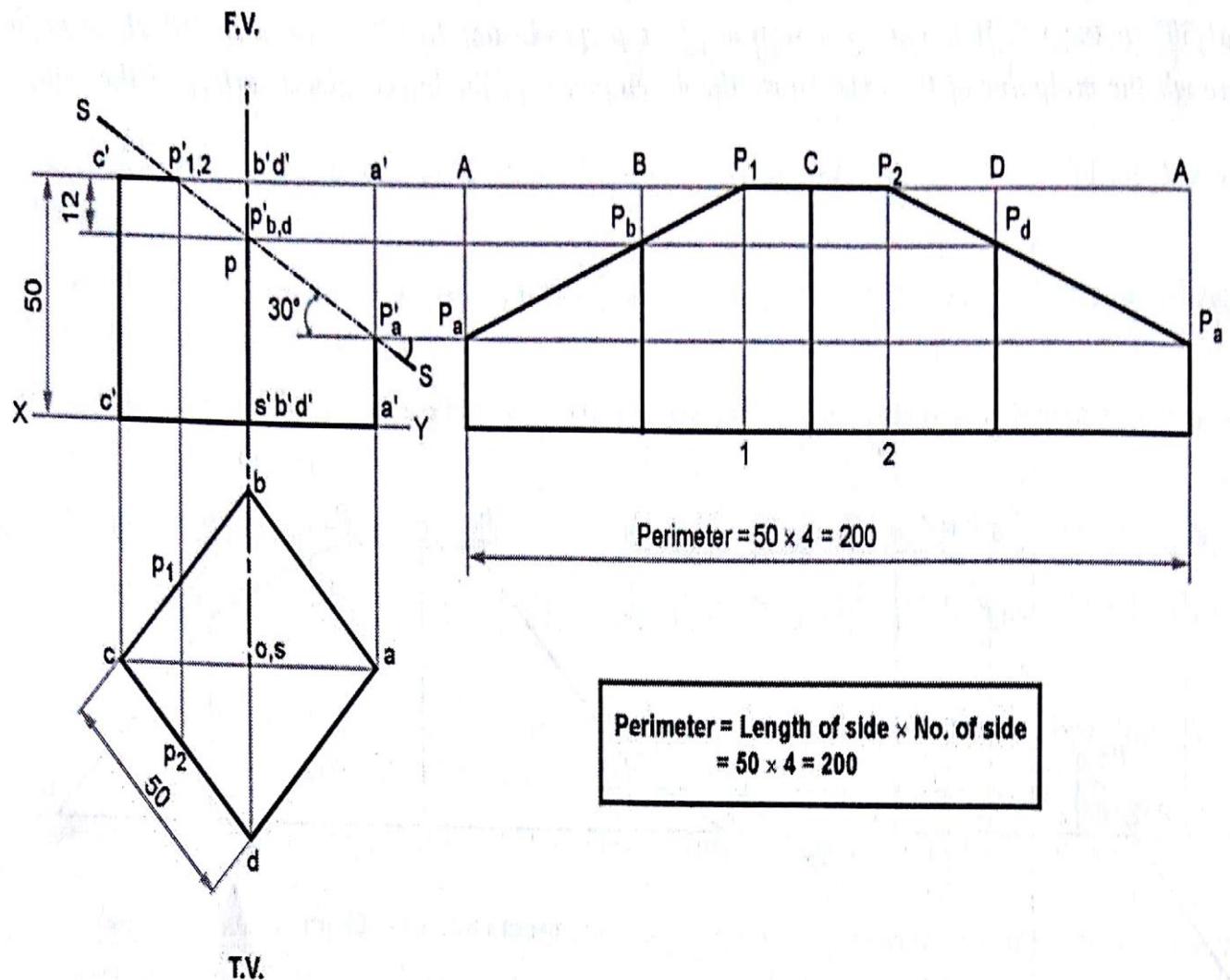
Solution:



Problem 18:

A cube of 50 mm edges, its resting on a face on H.P. such that all the sides equally inclined to V.P. and it is cut by a section plane perpendicular to V.P. and inclined at 30° to H.P., also passes through a axial point 12 mm from Top side. Draw the development of cube.

Solution:



Problem 19:

Draw the development of surface of a cylinder having base diameter 50 mm and axis height 80 mm. Kept on H.P. it is cut by a cutting plane which is inclined at 45° with H.P. and bisecting the axis of cylinder.

Solution:

