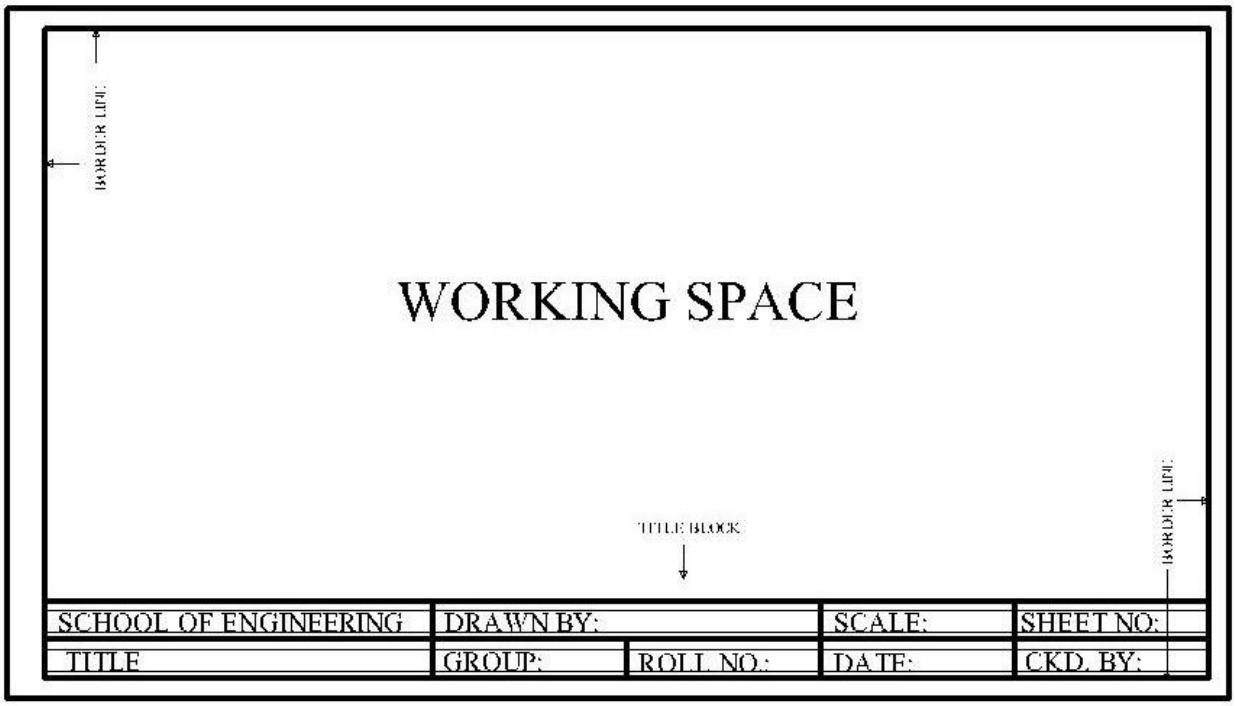
Engineering Drawing

Tutorial sheet

1) Lettering

1) Prepare Drawing sheet



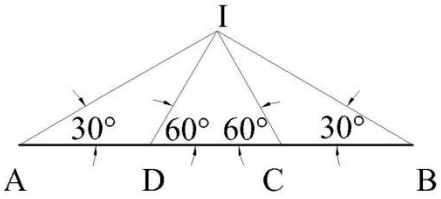
(Figure 1.1)

2) Write freehand, in single stroke vertical capital letters, small letters and numerals, using the ratio 7:5.

Applied Geometry

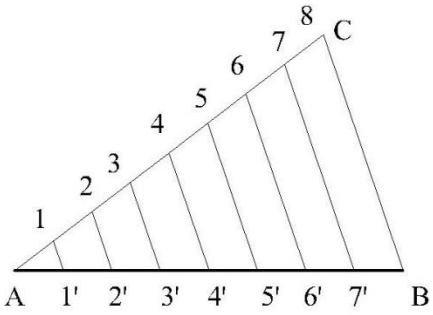
2) *Geometrical construction*

1) Trisect a straight line.



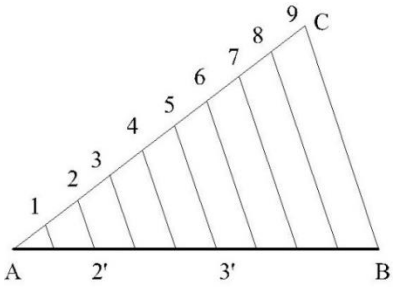
TRISECTION OF A STRAIGHT LINE

2) Divide a straight line in to given equal parts.



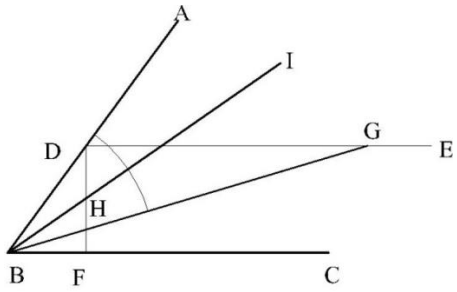
DIVISION OF A STRAIGHT LINE INTO EQUAL PARTS

3) **Divide a straight line in to given ratio.(2:3:4)**



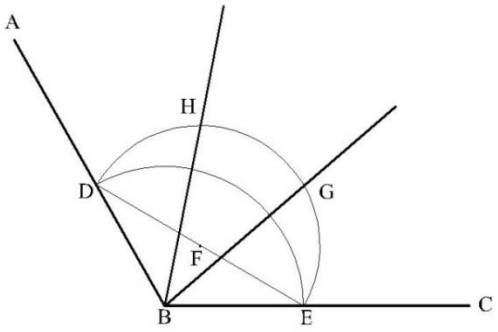
DIVISION OF A STRAIGHT LINE INTO GIVEN RATIO

4) **Trisect an acute angle.**



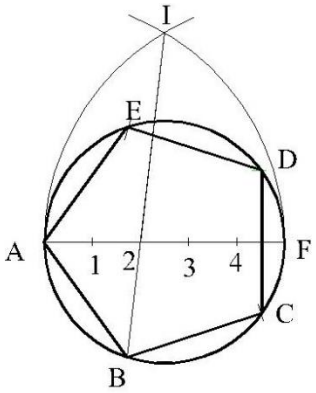
TRISECTION OF AN ACUTE ANGLE

5) Trisect an obtuse angle



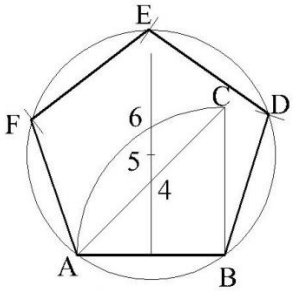
TRISECTION OF AN OBTUSE ANGLE

6) **Construct a regular polygon, inscribed in a circle of given diameter.**



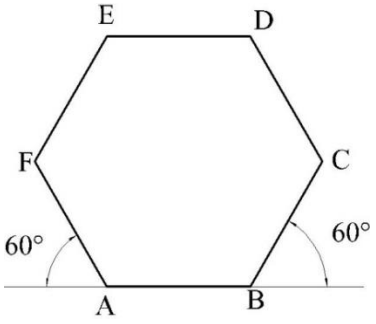
REGULAR PENTAGON INSCRIBED IN A GIVEN CIRCLE

7) Construct a regular polygon having given sides.

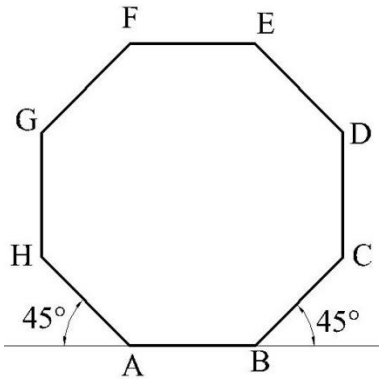


REGULAR PENTAGON HAVING GIVEN SIDE LENGTH

8) Construct a regular hexagon having side length 35 mm.(By using T scale and 30°-60° set square)



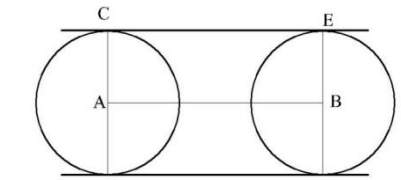
9) construct a regular octagon having side length30 mm.(By using T scale and 45°set square).



Pokhara University

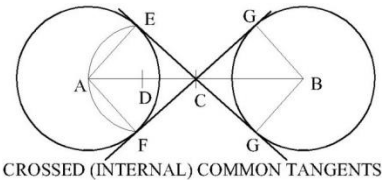
Tangents

1) **Construct an external (uncrossed) common tangent between two same circles, where the diameters and center to center distance of circles are given.**



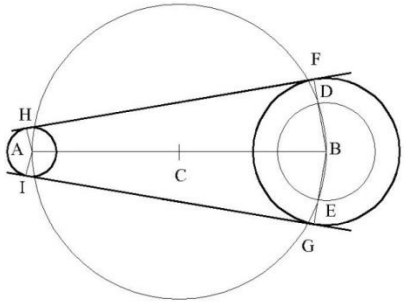
UNCROSSED (EXTERNAL) COMMON TANGENTS

2) **Construct an internal (crossed) common tangent between two same circles, where the diameters and center to center distance of circles are given.**



CROSSED (INTERNAL) COMMON TANGENTS

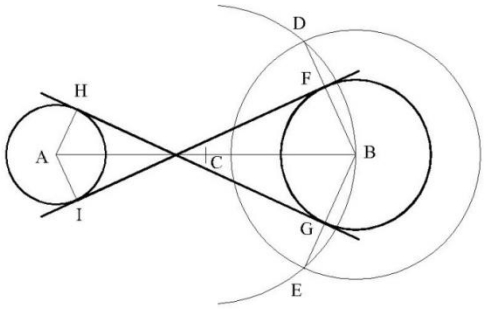
3) **Construct an external (uncrossed) common tangent between two different circles, where the diameters and center to center distance of circles are given.**



EXTERNAL COMMON TANGENTS

(Figure-3.3)

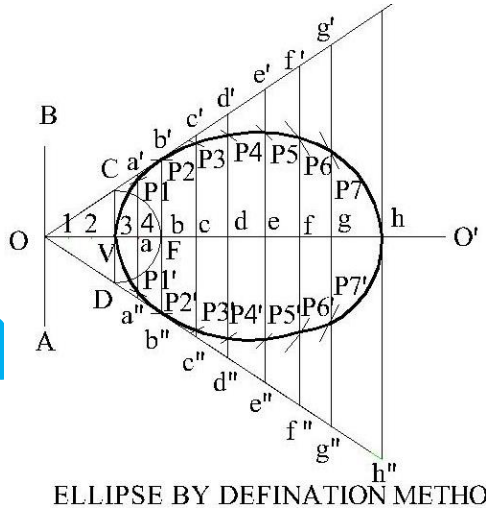
4) **Construct an internal (crossed) common tangent between two different circles, where the diameters and center to center distance of circles are given.**



INTERNAL COMMON TANGENTS

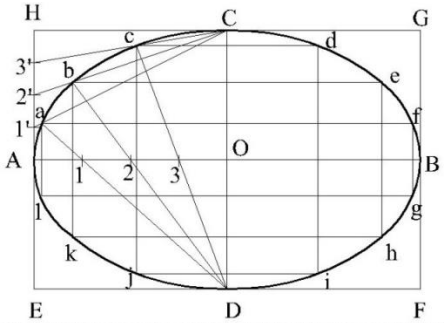
Conic section

1) **Construct an ellipse when the distance of the focus from ditrctrix is 35mm and eccentricity is 2/3.(Definition /eccentricity method)**



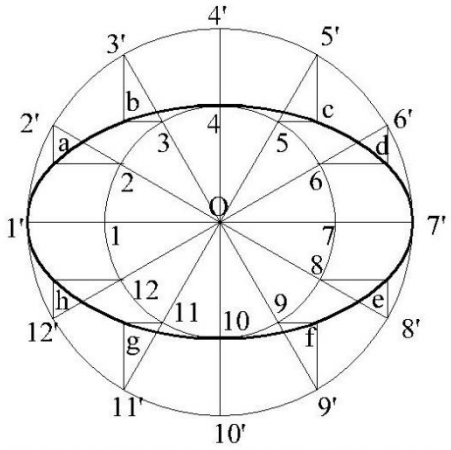
ELLIPSE BY DEFINATION METHOD

2) **Construct an ellipse by using rectangle/oblong method, where the major axis is 100mm and minor axis is 70mm.**



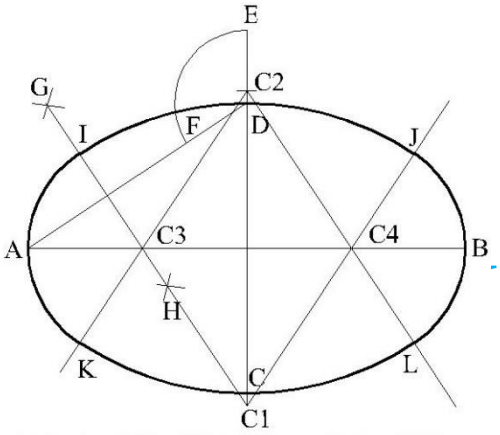
ELLIPSE BY OBLONG/RECTANGLE METHOD

3) **Construct an ellipse by using concentric circle method, where the major axis is 100mm and minor axis is 70 mm.**



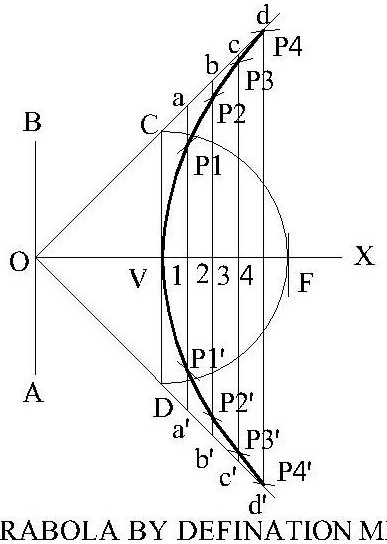
ELLIPSE BY CONCENTRIC CIRCLE METHOD

4) Construct an ellipse by using four center methods, where the major axis is 100mm and minor axis is 70 mm.



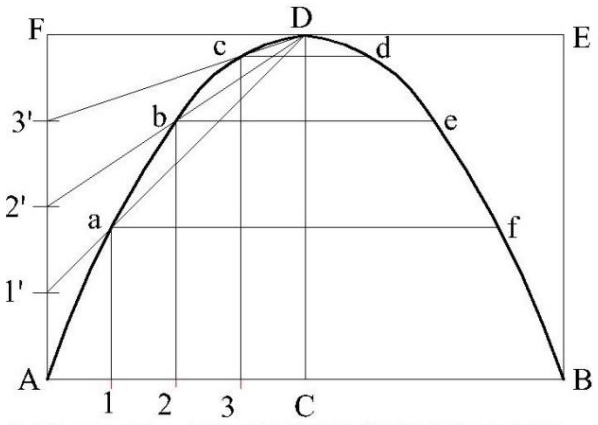
ELLIPSE BY FOUR CENTER METHOD

5)Draw a parabola, given the distance of the focus from directrix is 40mm.



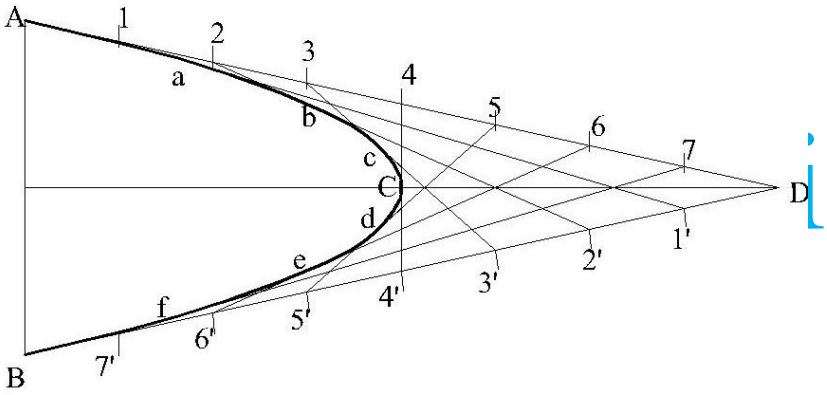
PARABOLA BY DEFINATION METHOD

***6)*Draw a parabola by using rectangle method where base of parabola is 70mm and height of axis is 60mm.**



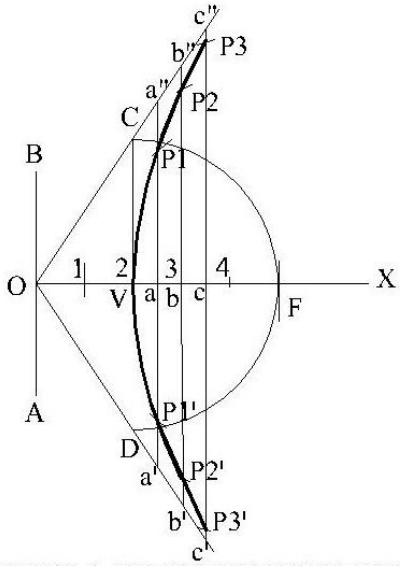
PARABOLA BY RECTANGLE METHOD

***7)*Draw a parabola by using triangular/tangent method where base of parabola is 70mm and height of axis is 60mm.**



PARABOLA BY TANGENT/TRIANGULAR METHOD

***8)*Construct a hyperbola when the distance of the focus from ditrctrix is 35mm and eccentricity is 3/2.(Definition /eccentricity method)**



HYPERBOLA BY DEFINATION METHOD

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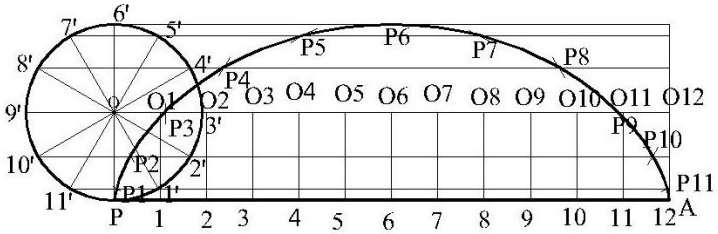
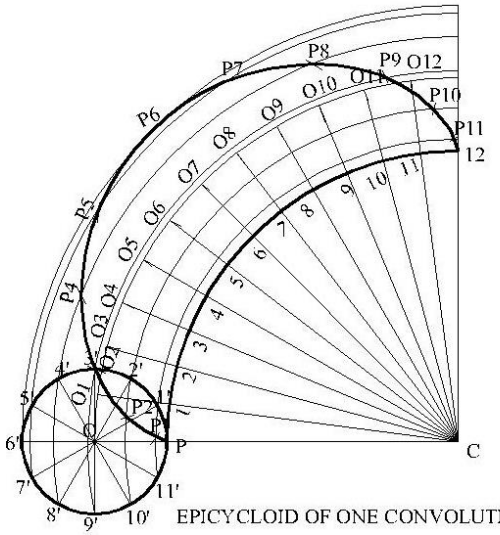
Curves and helix

1) Draw a cycloid of circle of diameter40mm.



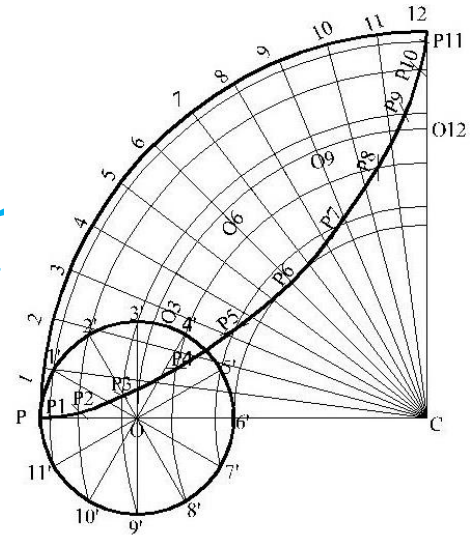
CYCLOID OF ONE CONVOLUTION

***2)*Draw epicycloids from the given generating circle of diameter 30mm and directing circle of diameter 90mm.**



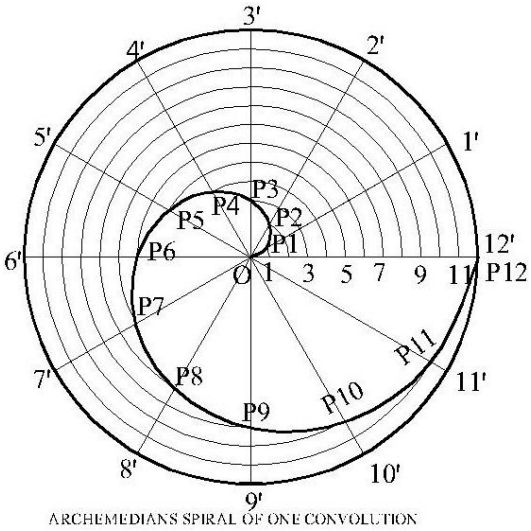
EPICYCLOID OF ONE CONVOLUTION

*3)***Draw hypocycloids from the given generating circle of diameter 30mm and directing circle of diameter 90mm.**



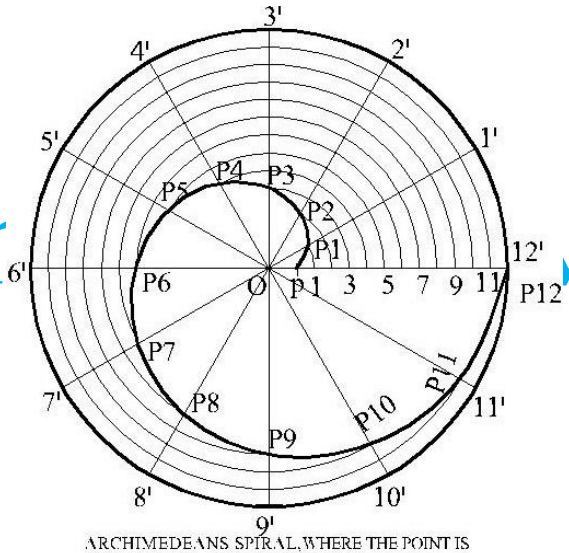
HYPOCYCLOID OF ONE CONVOLUTION

4) **Draw an Archimedean's spiral of one convolution, where the radius of circle is 40mm.**



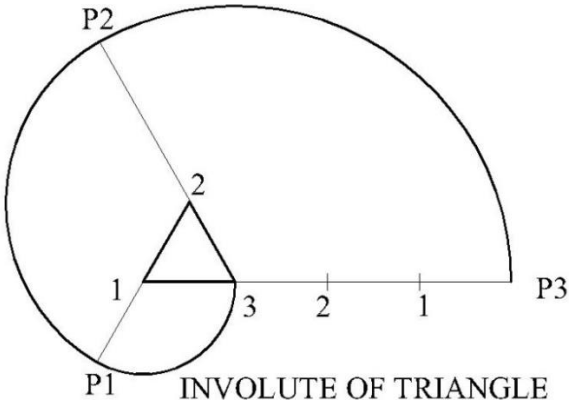
ARCHEMEDIANS SPIRAL OF ONE CONVOLUTION

5) **Draw an Archimedean's spiral of one convolution, where the radius of circle is 40mm.and the point is 10mm away from the center**.



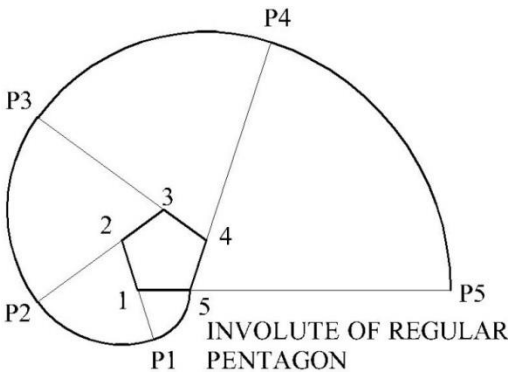
ARCHIMEDEANS SPIRAL, WHERE THE POINT IS AWAY FROM CENTER OF CIRCLE

6)**Draw involutes of equilateral triangle of sides 30mm.**



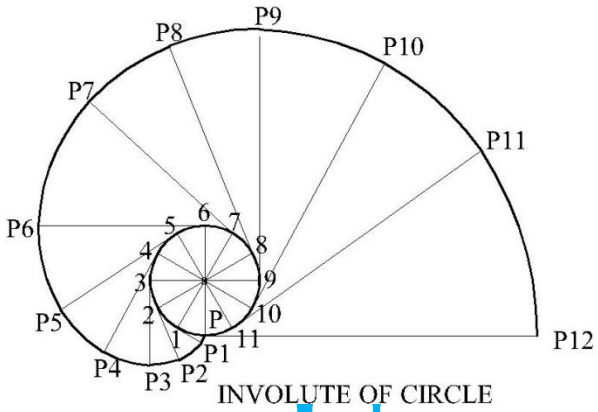
INVOLUTE OF TRIANGLE

7) **Draw involutes of regular pentagon of sides 20mm.**



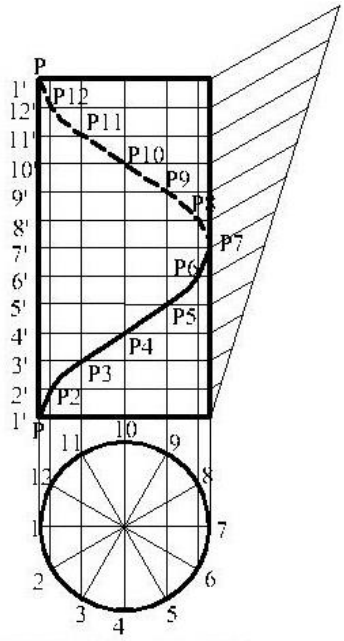
INVOLUTE OF REGULAR PENTAGON

8)**Draw involutes of circle of diameter 30mm.**



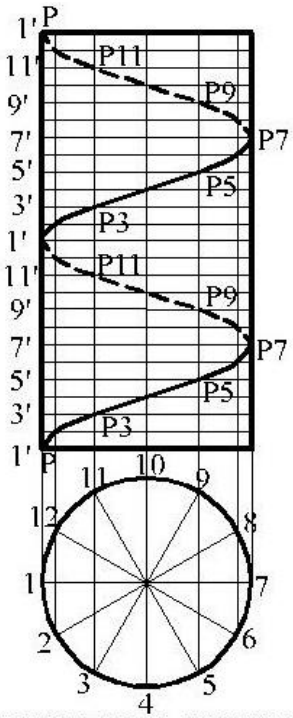
INVOLUTE OF CIRCLE

***9)*Draw a cylindrical helix of one convolution, where the diameter of cylinder is 60mm and height is 90mm.**



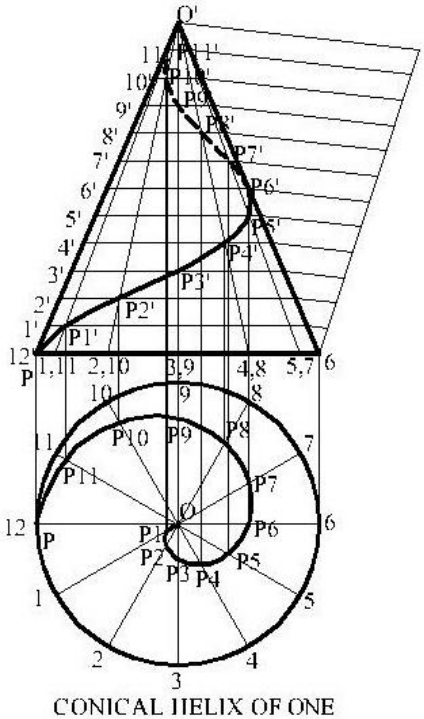
CYLINDRICAL HELIX OF 1 CONVOLUTION

***10)*Draw a cylindrical helix of two convolutions, where the diameter of cylinder is 60mm and height is 90mm.**



CYLINDRICAL HELIX OF 2 CONVOLUTION

11)Draw a conical helix of one convolutions, where the base diameter of cone is 60mm and axial height is 90mm.

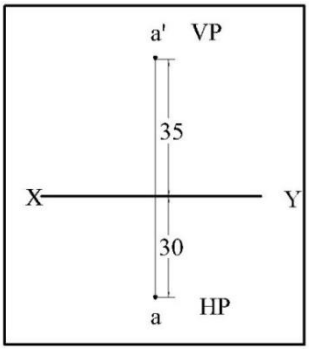


CONICAL HELIX OF ONE CONVOLUTION

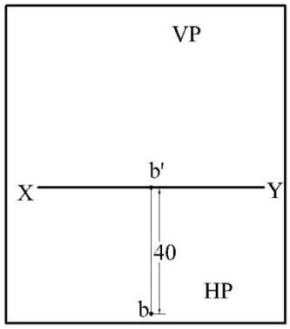
Basic Descriptive Geometry

Draw the projections of the following points

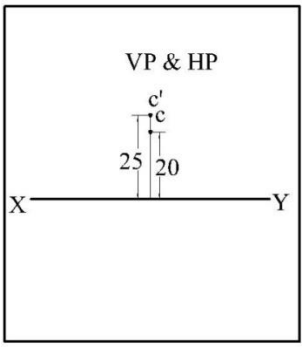
1)Point A, 30mm in front of VP and 35mm above HP



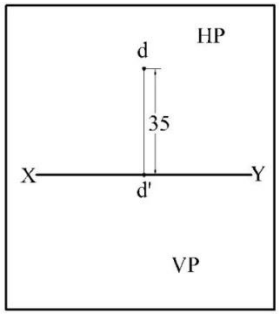
2)Point B, 40mm infront of VP and in the HP.



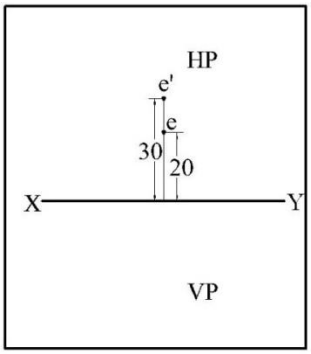
3)Point C, 20mm behind VP and 25mm above HP



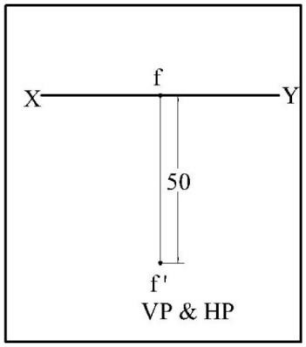
4)Point D, 35mm behind VP and in the HP.



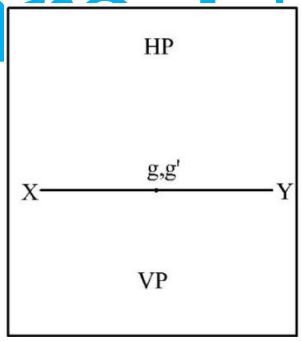
5)Point E, 20mm behind VP and 30mm below HP.



6) Point F, in the VP and 50mm below HP.

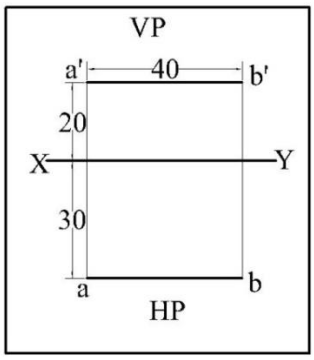


7)Point G, in the HP and VP.

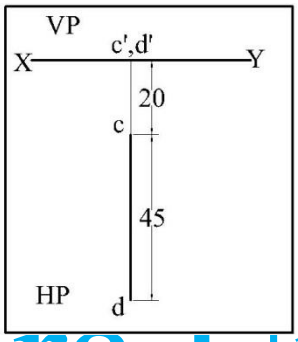


Draw the projection of the following lines.

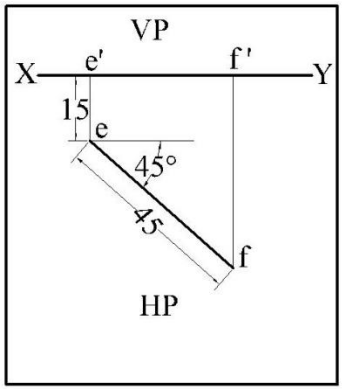
1) Line AB, 40mm long, parallel to HP and VP both, when the distance from HP and VP is 20mm and 30mm respectively.



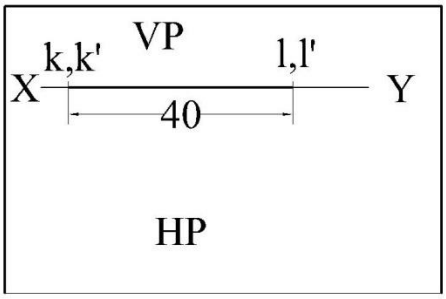
2) Line CD, 45mm long contained by HP, and perpendicular to VP, when one of its end is 20mm away from the VP



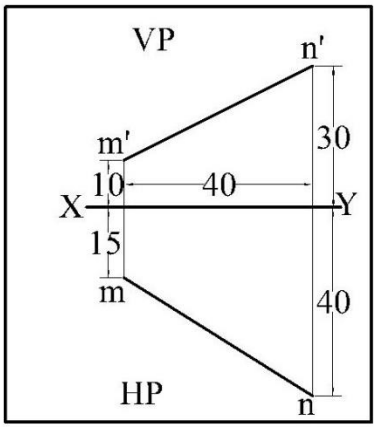
3) Line EF, 50mm long, contained by HP and inclined to VP at 45°, when one of its end is 15mm from the VP.



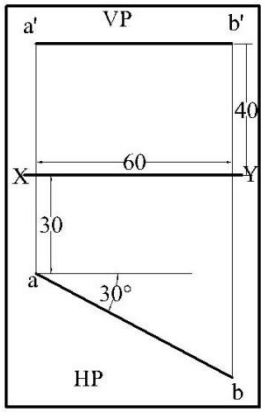
4) Line KL, 40mm long, contained by both HP and VP.



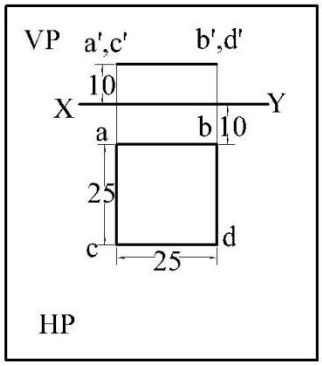
a) Draw the projection of the line MN when its end M is 10mm from the HP and 15mm from the VP and end N is 30mm from the HP and 40mm from the VP. Its end projectors are 40mm apart.



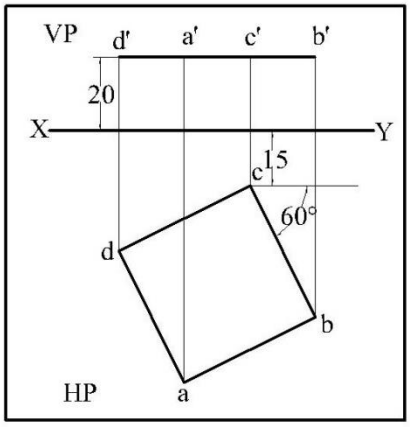
b) The front view of line inclined at 30° **to** the VP is 60mm long. Draw the projection of the line, when it is parallel to and 40mm above the HP, its one end being 30mm in front of the VP.



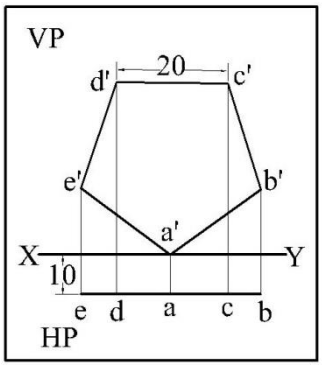
c) A square lamina ABCD, having 25mm side is parallel to HP and is 10mm from it. Its side nearer to VP is parallel to and 10mm from VP. Draw its projection.



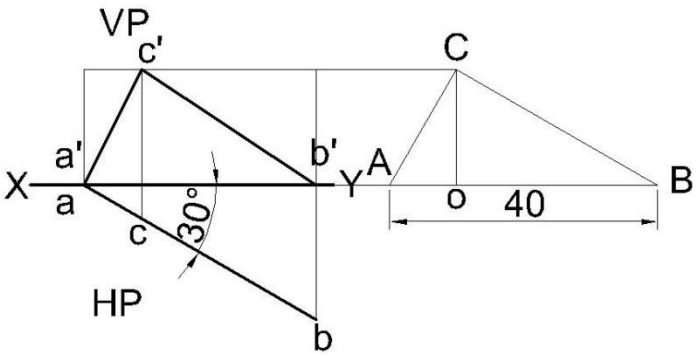
d) A square plane ABCD of 40mm side is parallel to HP with one of its side inclined at 60° to VP and one corner of square close to the VP is 15mm in front of VP and 20mm above the HP. Draw its projections.



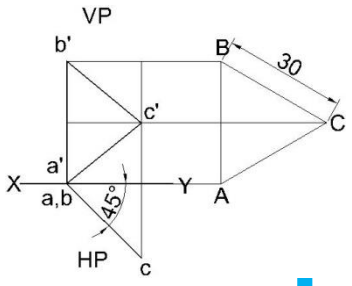
e)A regular pentagon ABCDE, of 20mm sides has its one corner A in the HP and the side CD is parallels to HP. Draw its projections when its plane is parallel to and 10mm from the VP.



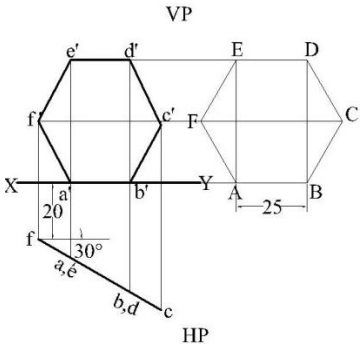
f) A 60° set square of 40mm longest side, is so kept, that the longest side is in the HP making an angle of 30° with XY line. Draw the projections of the set square if it is perpendicular with HP.



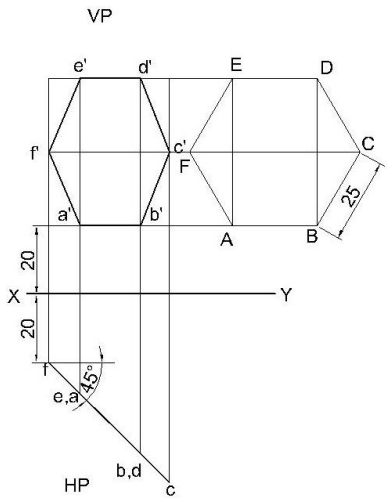
g) An equilateral triangle ABC, side 30 mm has its corner A in HP and side AC inclined at 45° to VP. The corners A and B are in VP. Draw its projections, if the plane is perpendicular with HP.



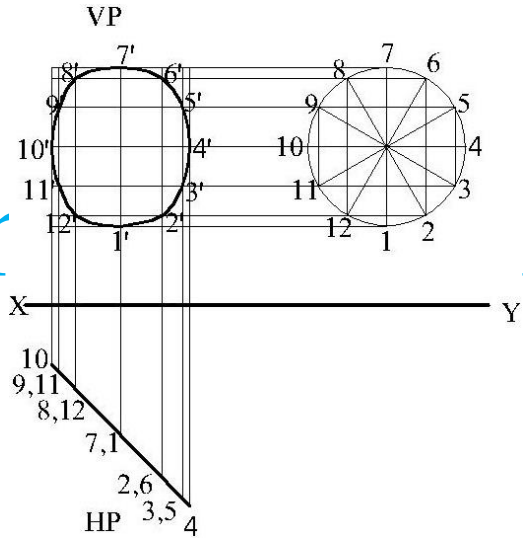
h) A regular hexagon of 25mm side has one side in HP. The plane is inclined at 30° to the VP and perpendicular to the HP. The corner nearer to the V.P. is 20mm in front of VP. Draw the projections of the plane.



I) A regular hexagonal plate having negligible thickness of sides 20 mm is perpendicular to the HP and inclined with VP at 45°. One side of hexagon nearest to the HP is parallel to HP and 15mm above from it. The nearest corner to the VP is 1mm in front of it. Draw its projection.

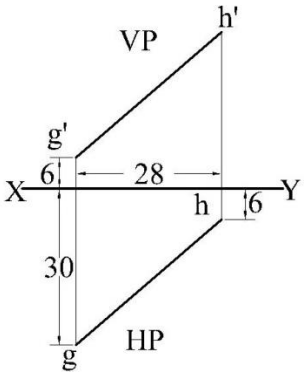


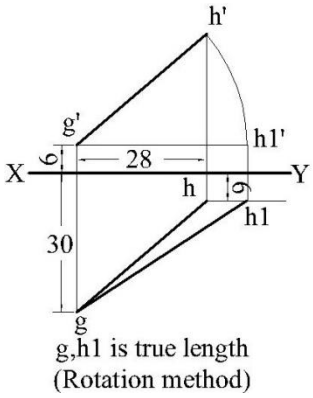
j) Draw the projection of a thin circular sheet of 50mm diameter and negligible thickness, when its plane is inclined at45°to the VP and is perpendicular to the HP. A point on its circumference and nearest to the VP is 40mm away from H.P. and 14mm from the VP.



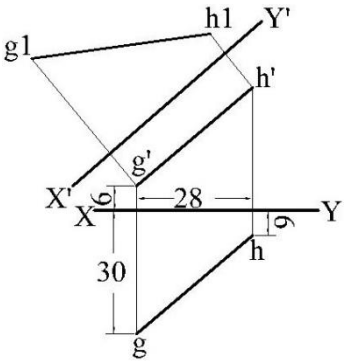
Methods for determining the true length:

Reproduced the given views of the lines and determine the true length. (Using auxiliary plane method and rotation method).

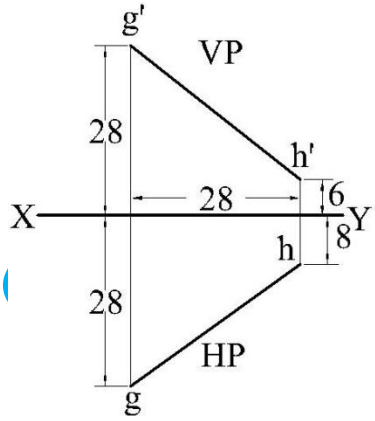


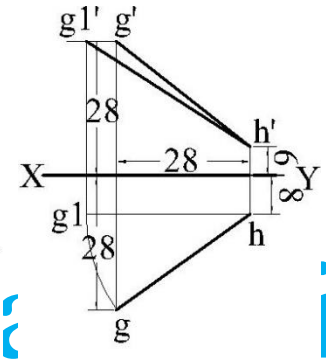


g,h1 is true length
(Rotation method)

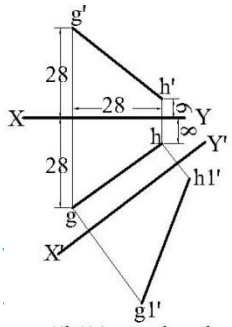


g1, h1 is true length
X',Y' is auxilary plane
(Auxiliary method)





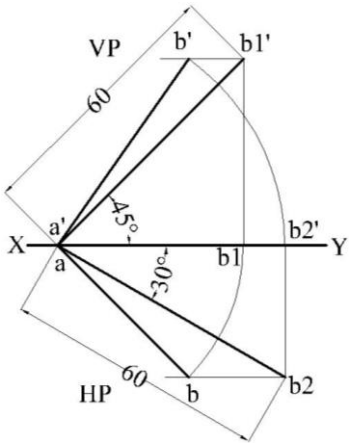
h',g1' is true length
(Rotation method)



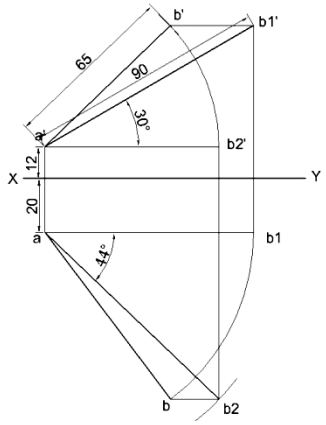
g1'h1' is true length
X',Y'is auxilary plane
(Auxiliary plane method)

Draw the projections of the following lines

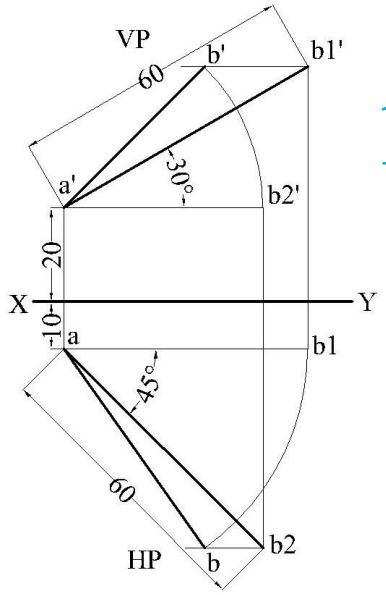
a) A line AB 60 mm long has its end A in both VP and HP. It is inclined at 45°to the HP and 30° to the VP. Draw its projections.



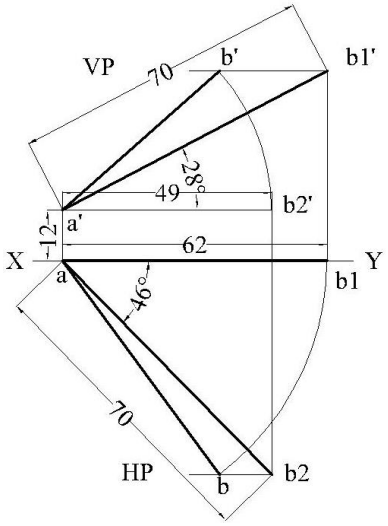
b) A line AB, 70mm long, is inclined at 30° to the HP. Its end A is 12mm above HP and 20mm in front of VP. Its front view measures 45mm long. Draw the top view of AB and determine the inclination with VP.



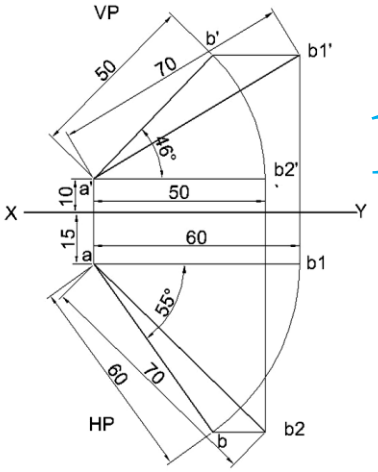
c) A line AB 60mm long makes 45° and 30° with VP and HP respectively. Draw its projections when end A is 10mm in front of VP and 20 mm above HP.



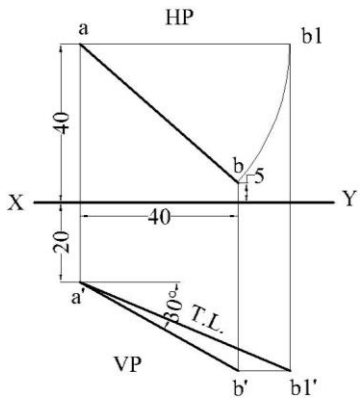
d) The top view of straight line AB 70 mm long, measures 62mm while front view is 49mm.Its end A is in the VP and 12 mm above HP. Draw its projection and determine the inclination with HP and VP.



e) A line 70 mm long has its end A at 10mm above HP and 15mm in front of VP. Its front view and top view measure 50 mm and 60 mm respectively. Draw the projections of line and determine its inclination with VP and Hp.

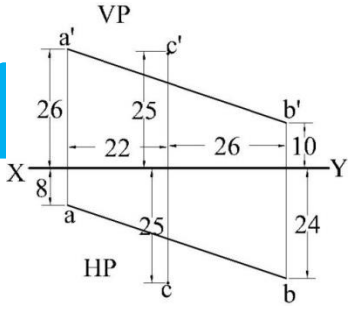


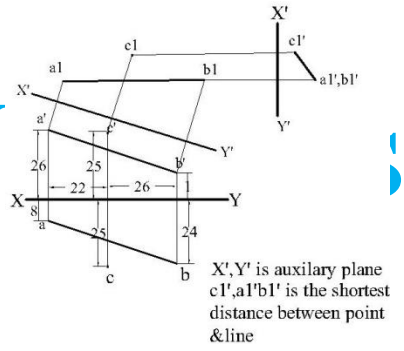
f) Distance between the end projectors of a straight line AB is 40 mm. End A is 40 mm behind VP and 20 mm below HP and end B is 5 mm behind VP. The line is inclined at 30° to the HP. Draw its projection and also find the true length.



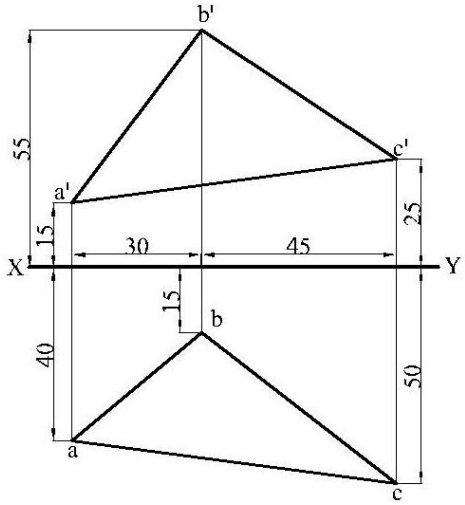
g) A line AB, inclined at 30° to the VP has its ends 50mm and 20mm below HP. The length of its front view is 65mm and its VT is 10 mm below the HP. Find its TL and inclination with HP.

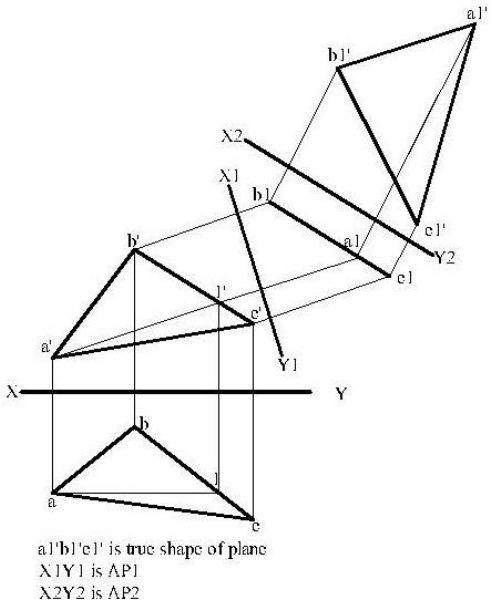
Reproduced the given views of line AB & point C and determine the shortest distance between line & point. Figure 1.3



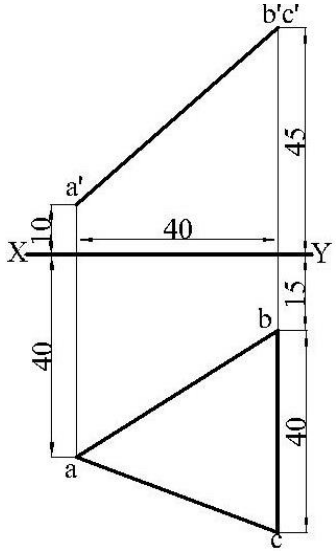


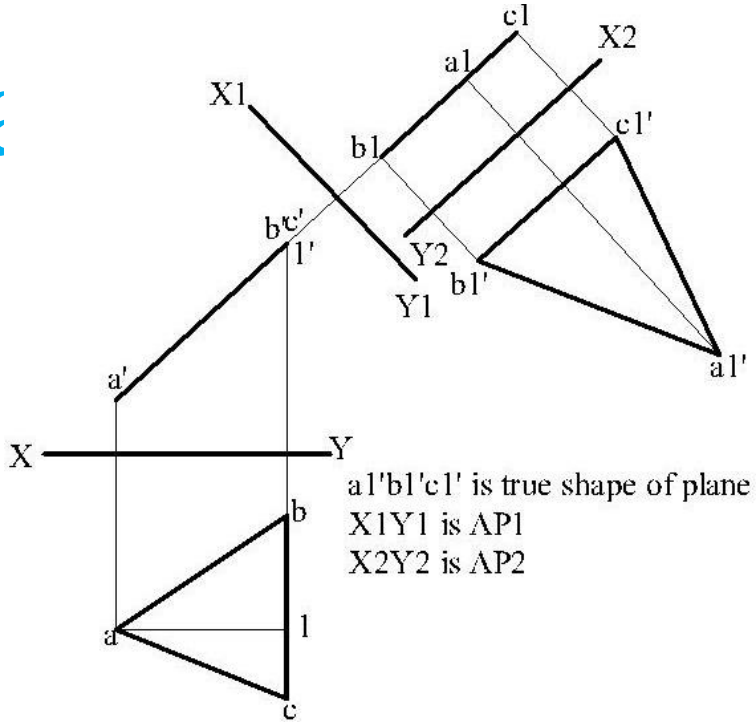
Reproduced the given views of plane and draw the true shape (auxiliary plane method)



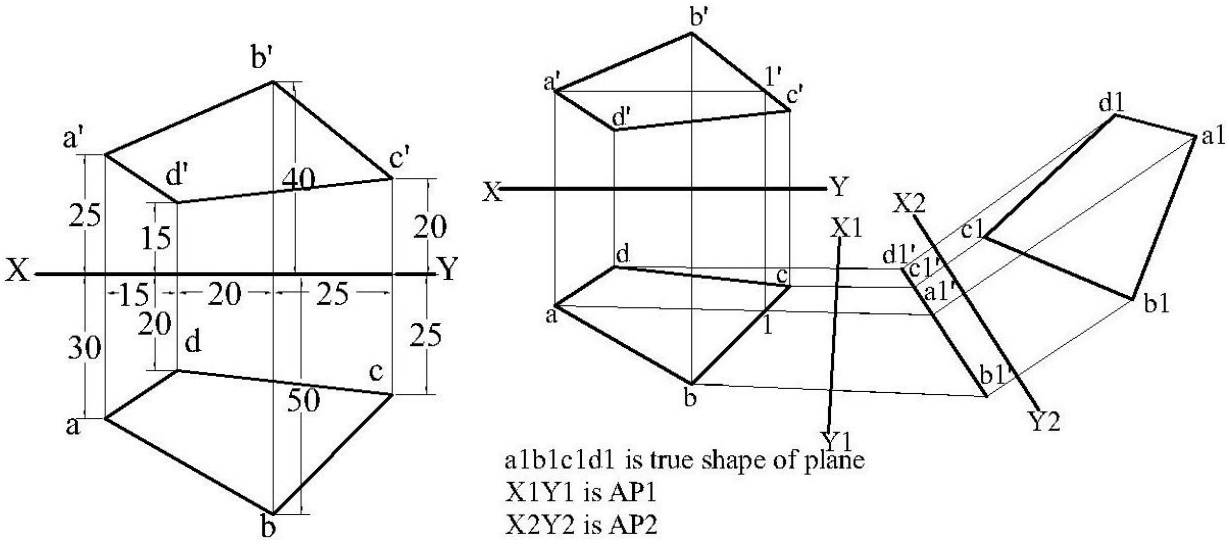


a1'b1'c1' is true shape of plane
X1Y1 is AP1
X2Y2 is AP2



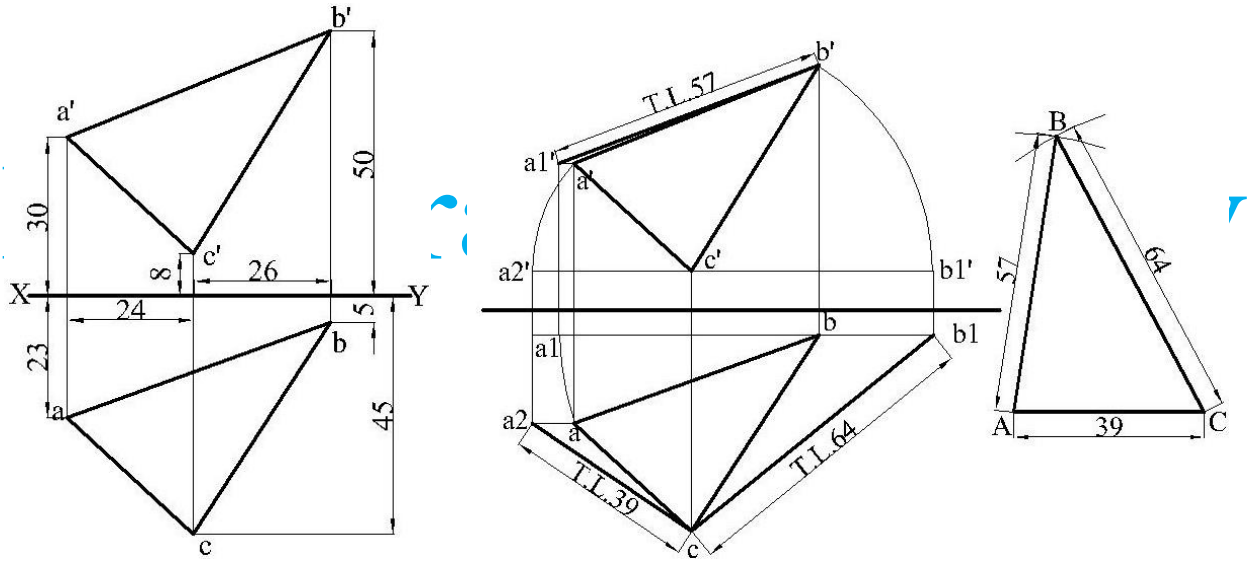


a1'b1'c1' is true shape of plane
X1Y1 is AP1
X2Y2 is AP2

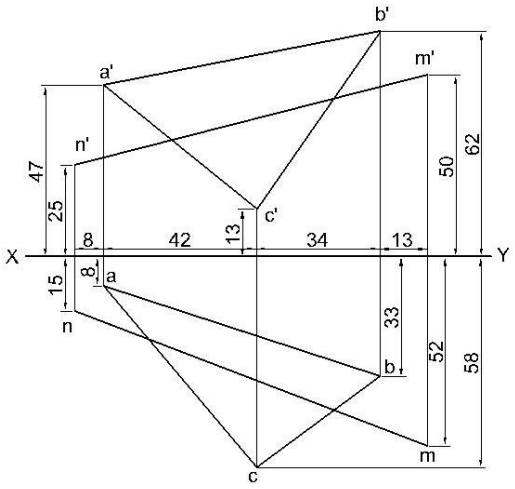


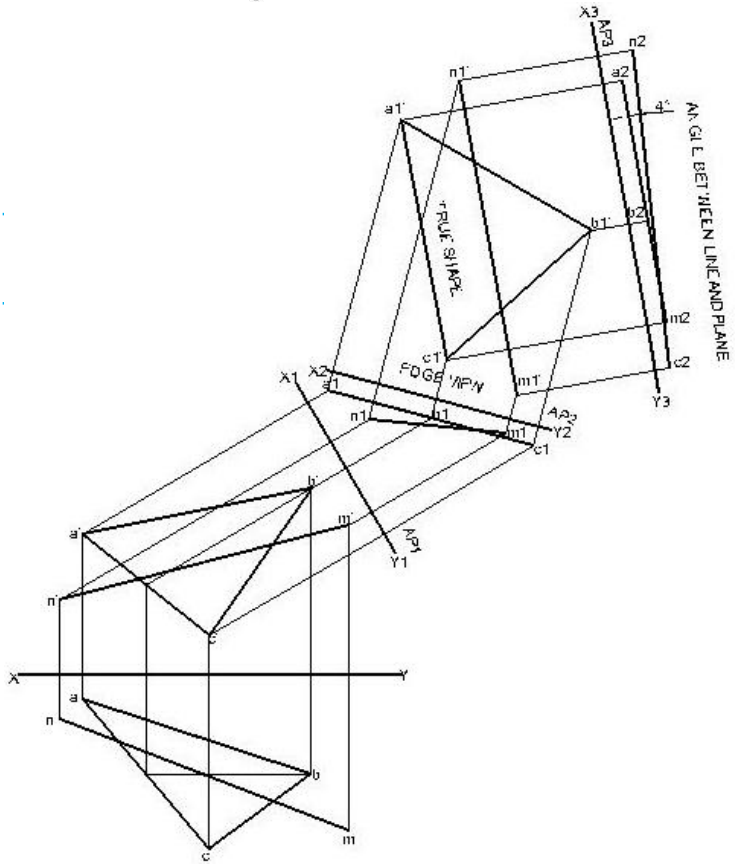
a1b1c1d1 is true shape of plane
X1Y1 is AP1
X2Y2 is AP2

Reproduced the given views of plane and find its true shape (rotation method).

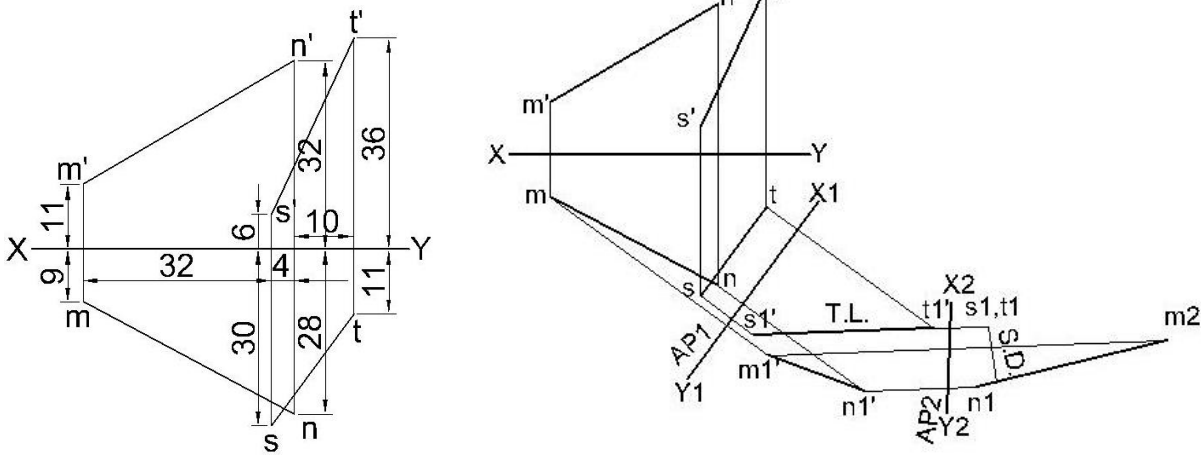


Reproduce the given views of plane ABC and line MN and determine the angle between plane and line.

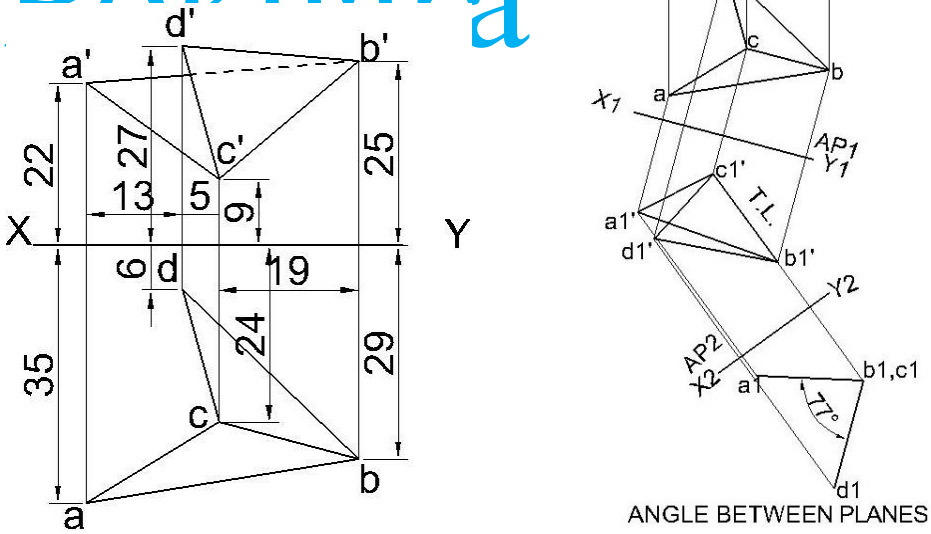




Reproduce the given views of line MN and ST, and find the shortest distance between lines.



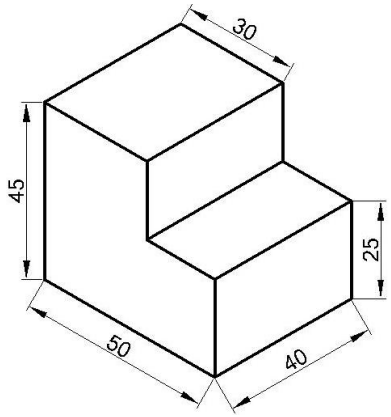
Rrproduce the given views of plane ABC and BCD, and find the angle between them.

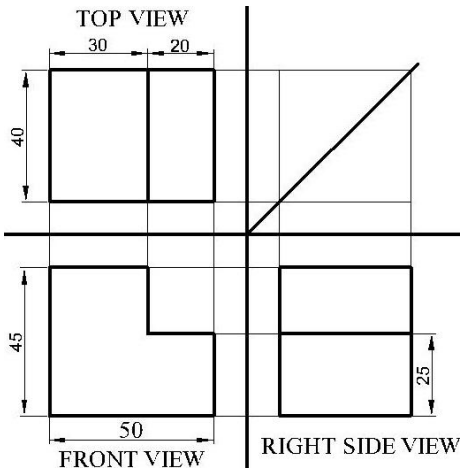


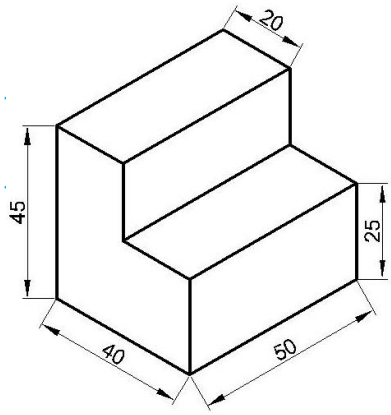
ANGLE BETWEEN PLANES

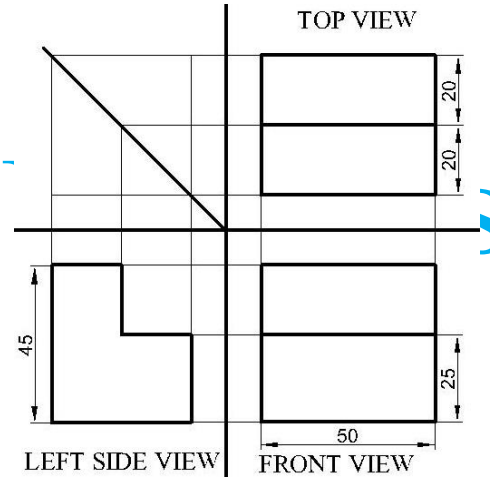
Orthographic projection

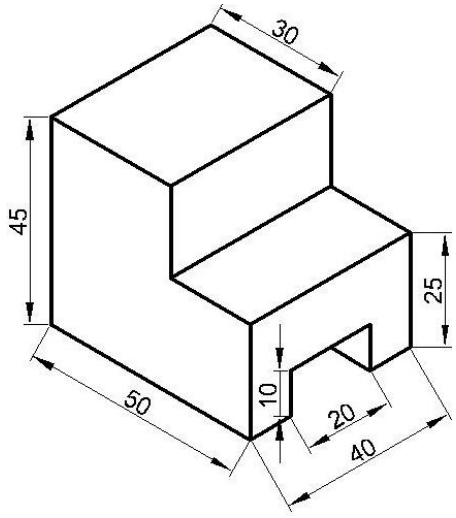
Draw complete orthographic views (Top, Side & Front) of the given solid figures.

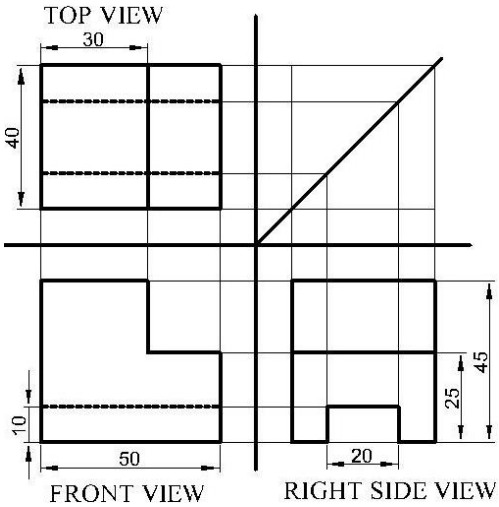


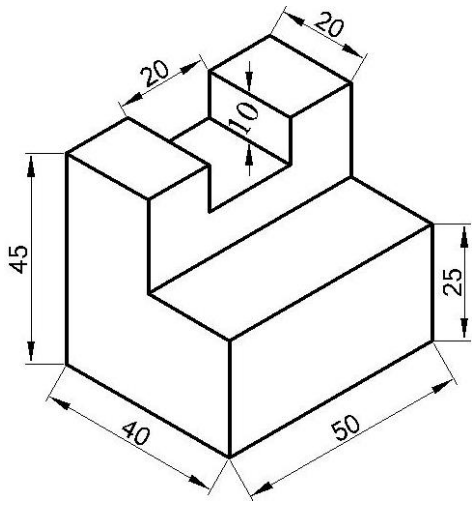








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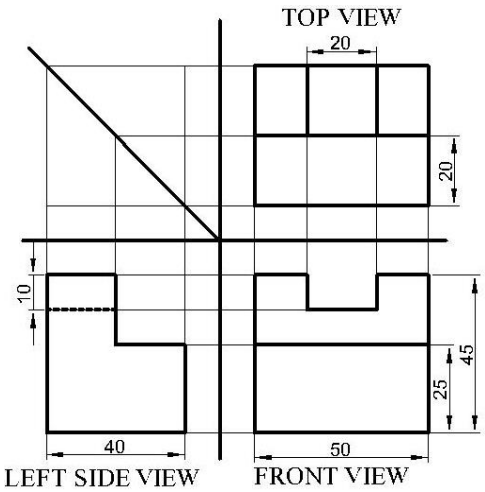
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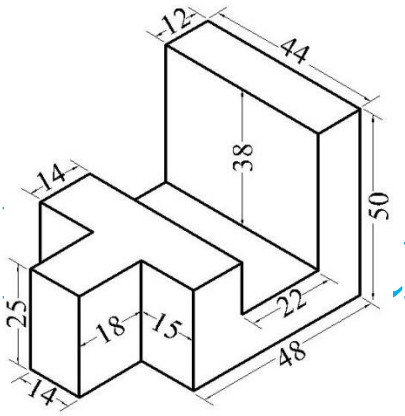
FRONT VIEW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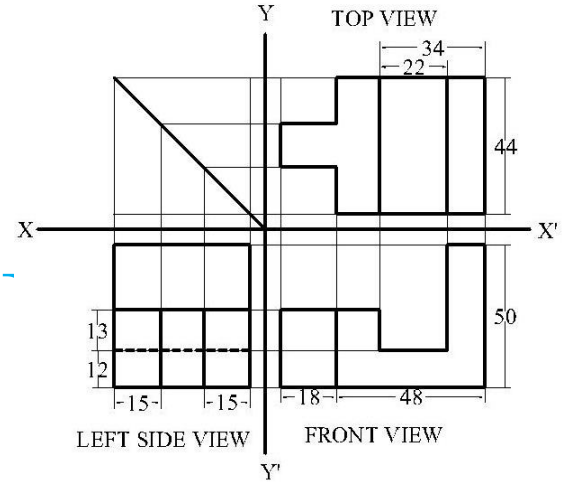
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LEFT SIDE VIEW
FRONT VIEW
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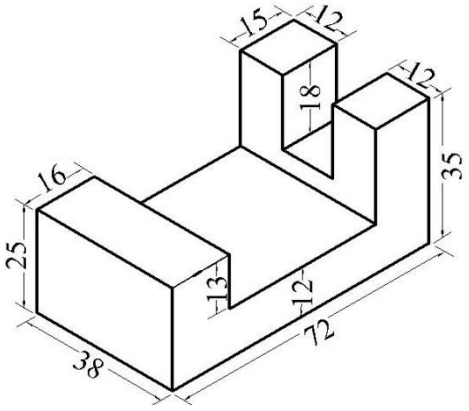
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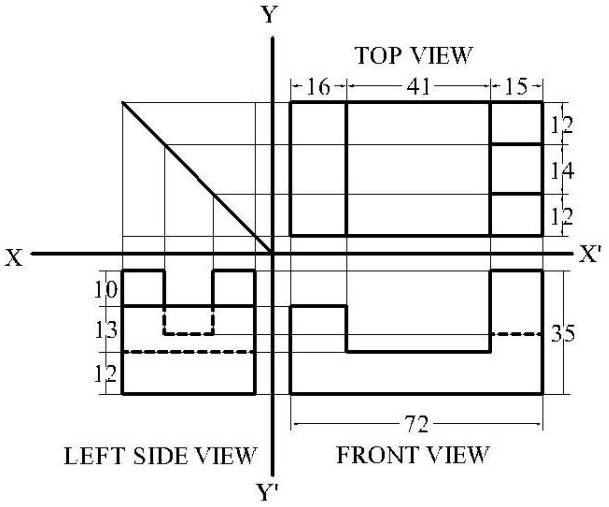
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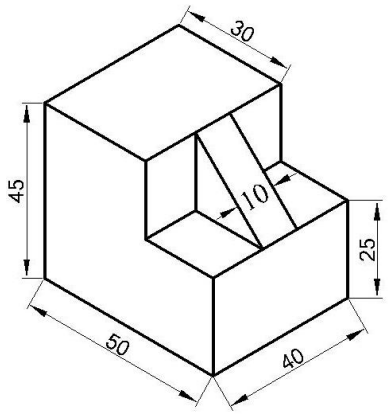
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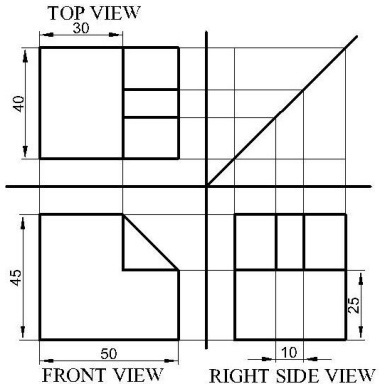
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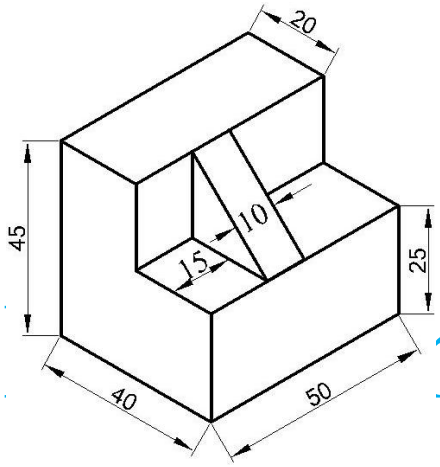
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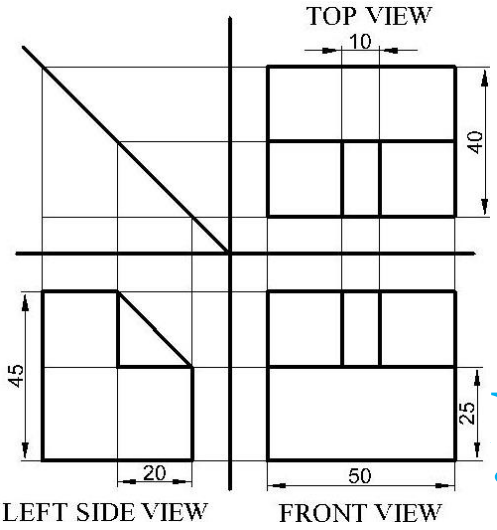
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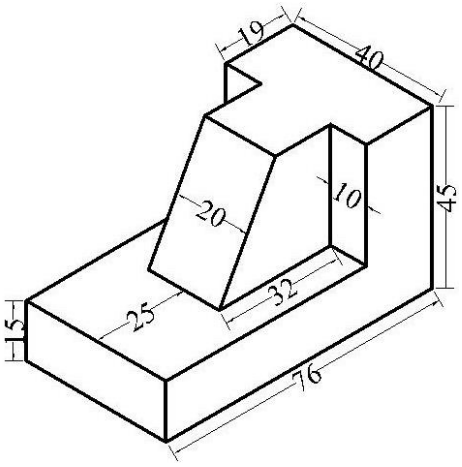
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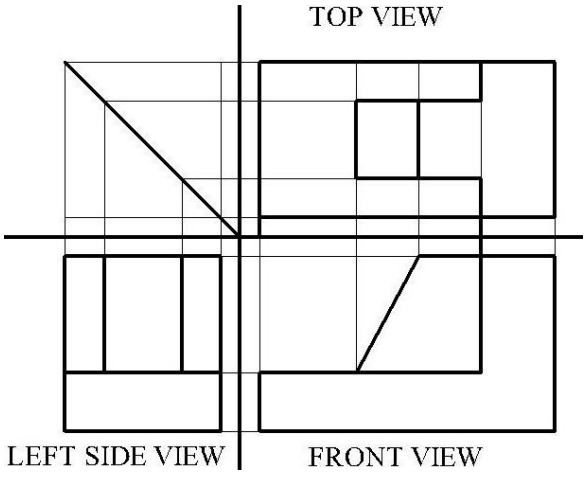
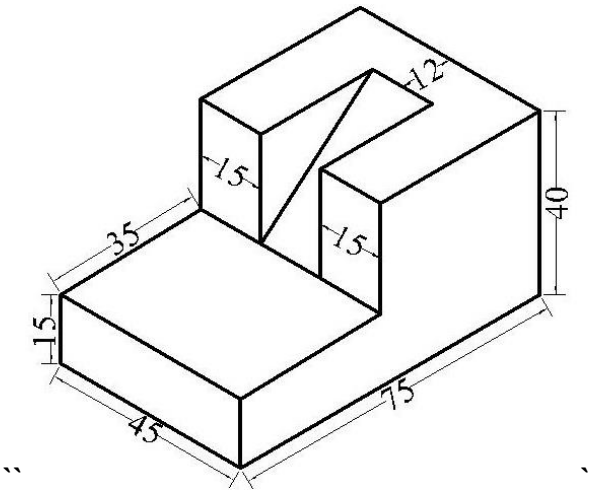

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW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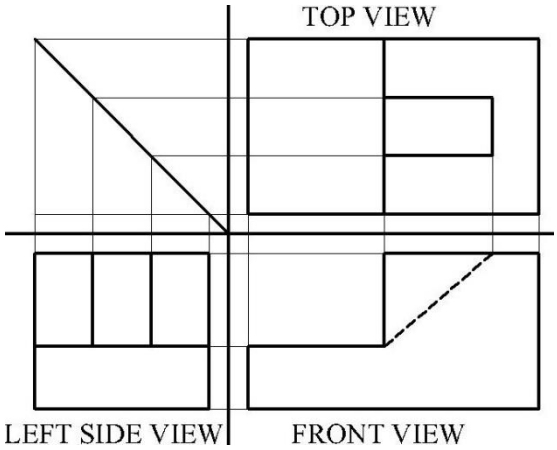
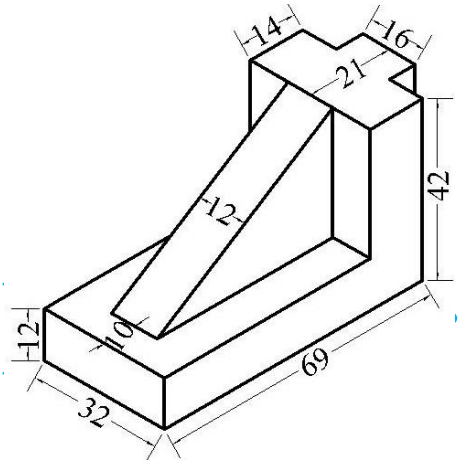

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW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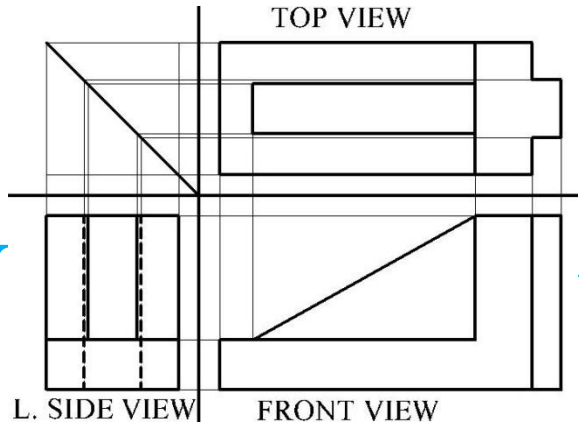
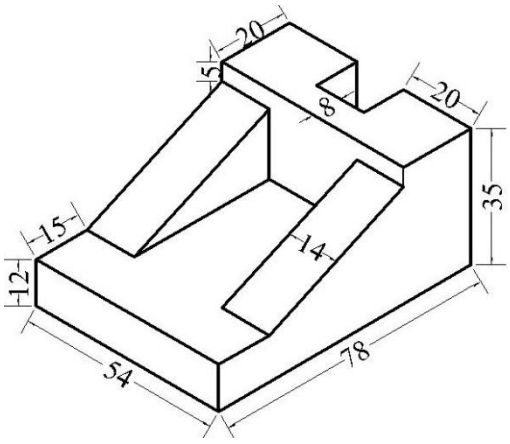

TOP VIEW
L. SIDE VIEW
FRONT VIEW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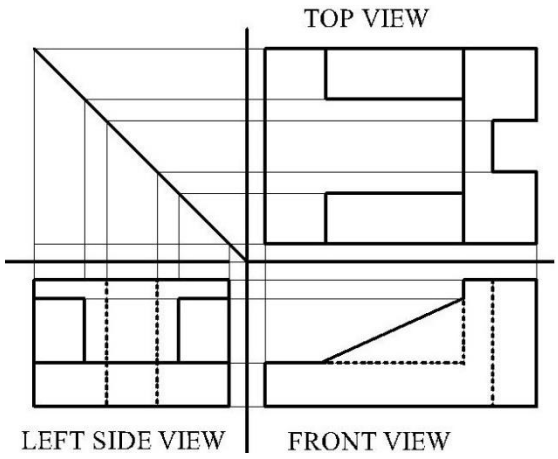
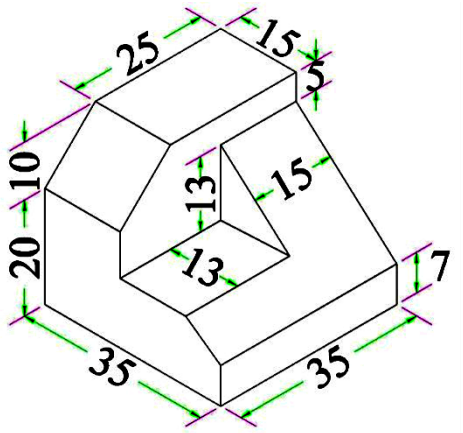

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW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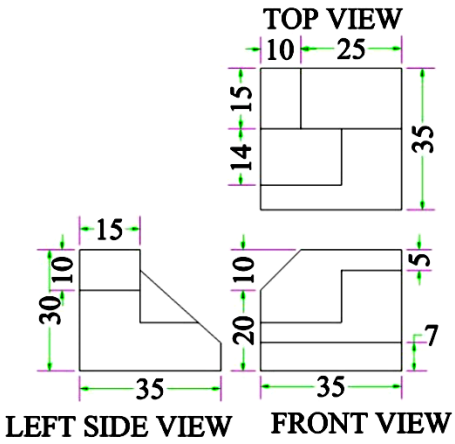
TOP VIEW
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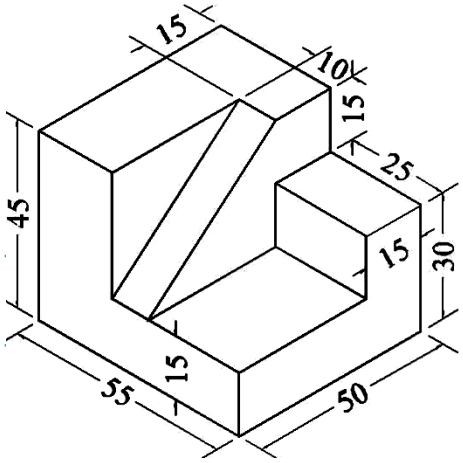
LEFT SIDE VIEW
FRONT VIEW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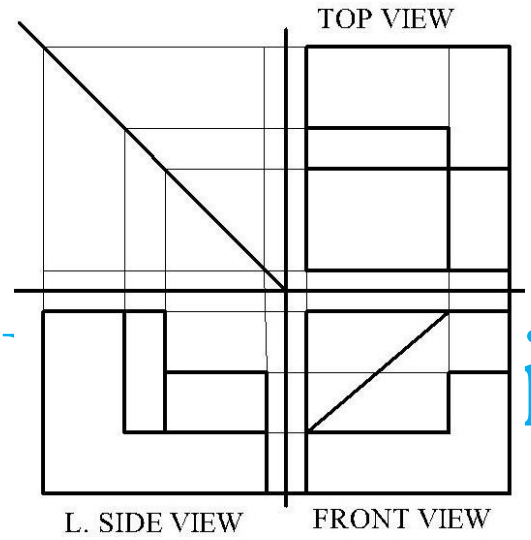
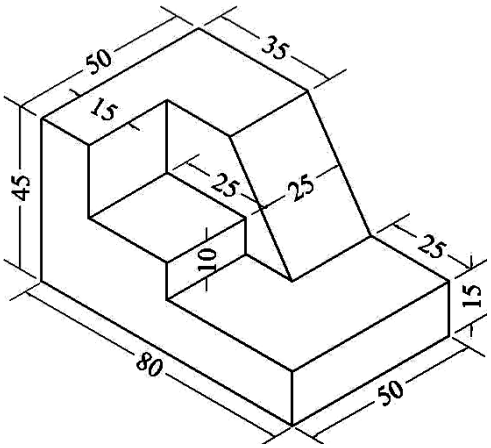

TOP VIEW
L. SIDE VIEW
FRONT VIEW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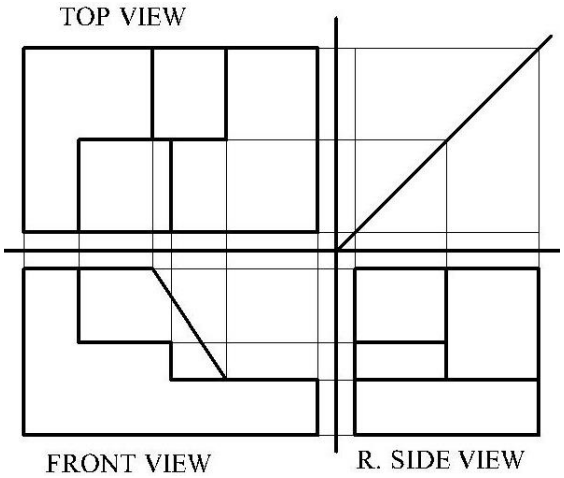
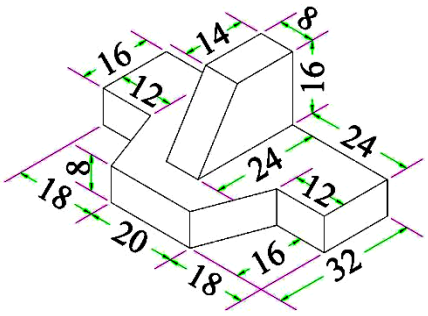

TOP VIEW
FRONT VIEW
R. SIDE VIEW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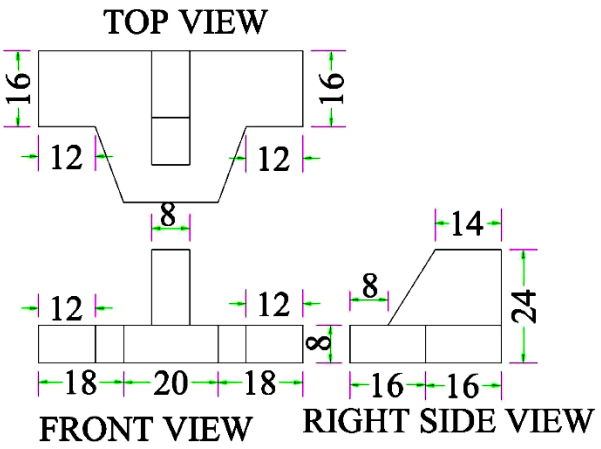
TOP VIEW
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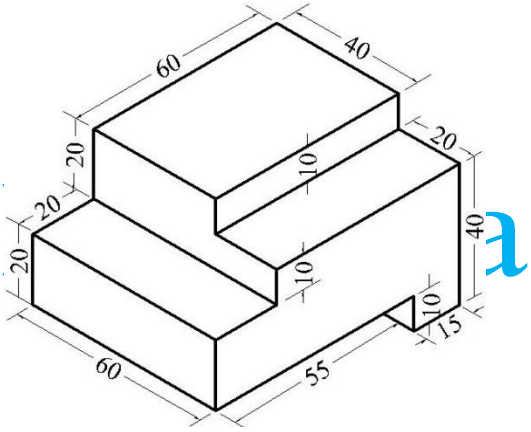
FRONT VIEW
RIGHT SIDE VIEW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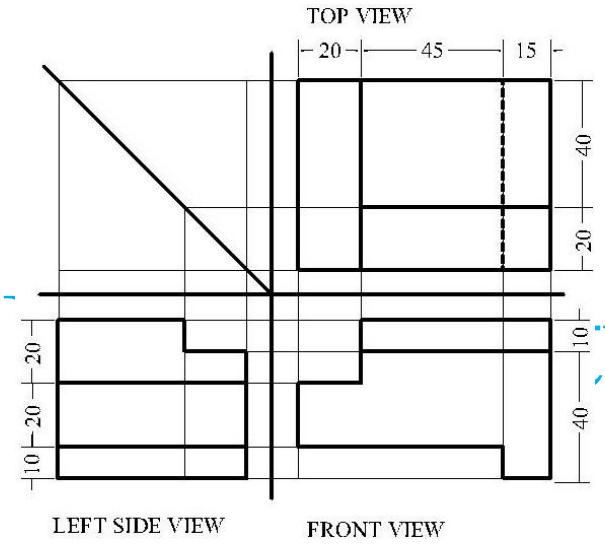
TOP VIEW
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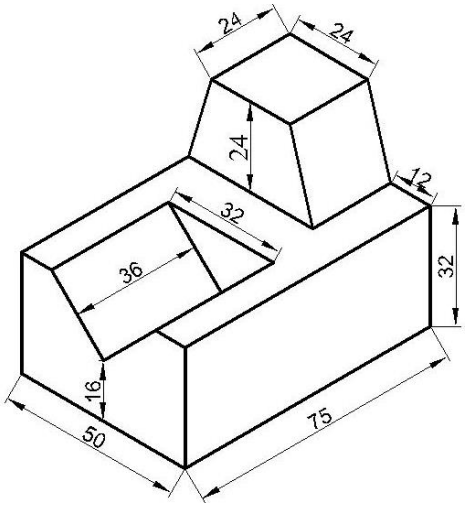
LEFT SIDE VIEW
FRONT VIEW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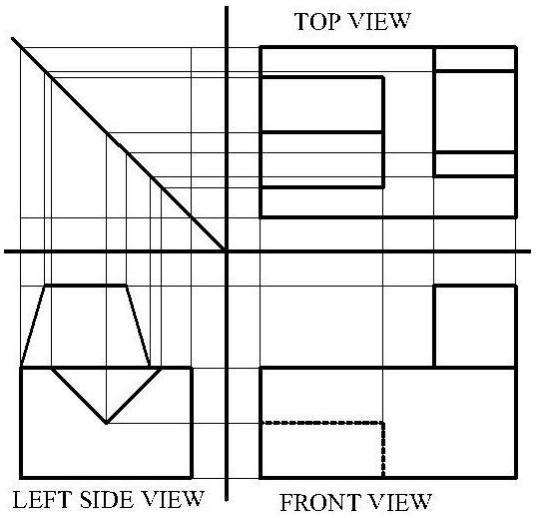
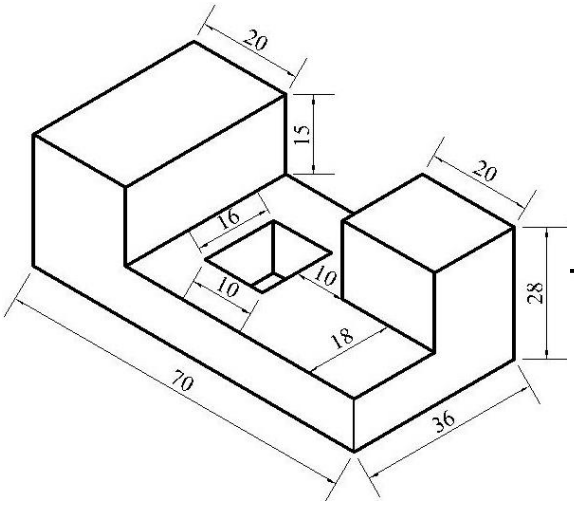

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW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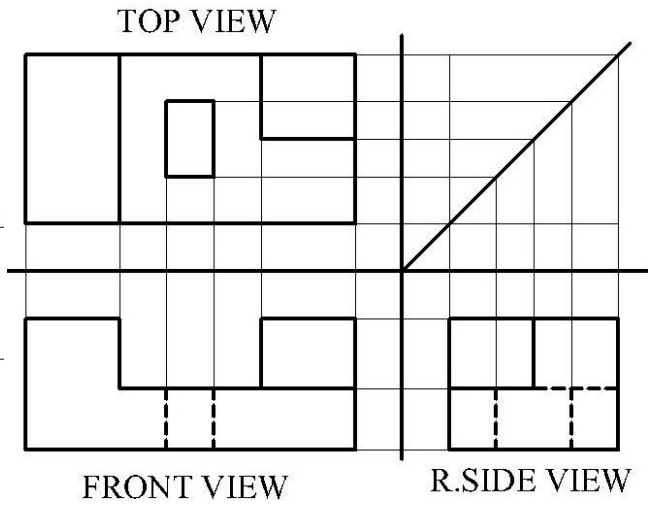
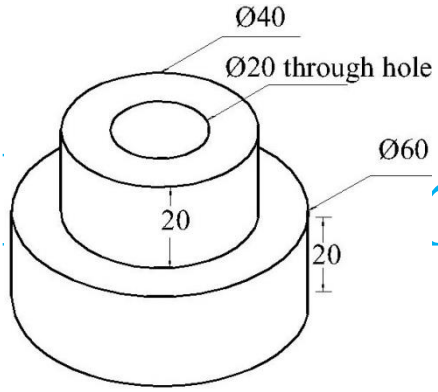

TOP VIEW
FRONT VIEW
R.SIDE VIEW


Ø40
Ø20 through hole
Ø60
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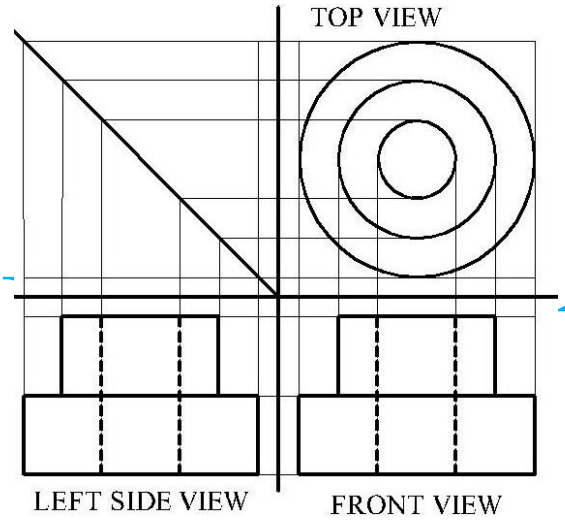
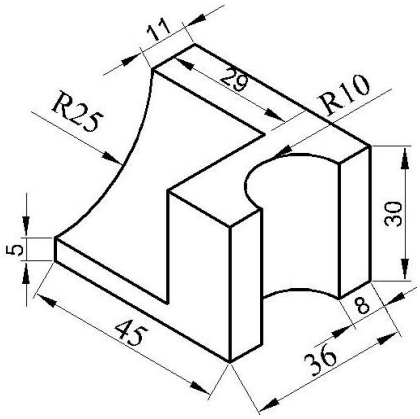

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW


11
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R10
R25
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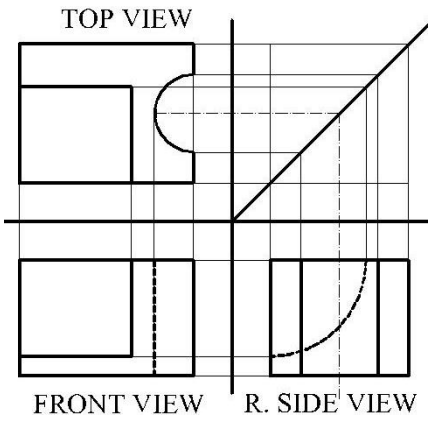
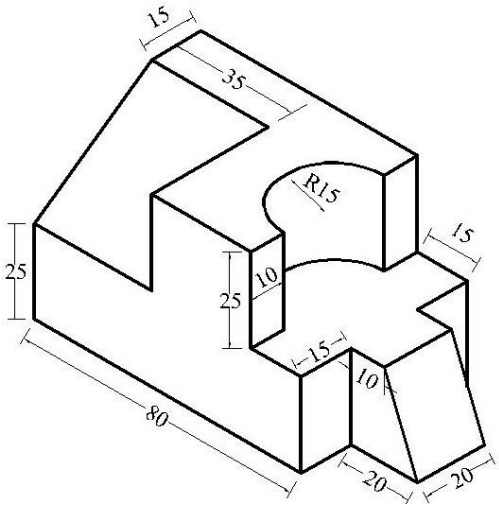

TOP VIEW
FRONT VIEW
R. SIDE VIEW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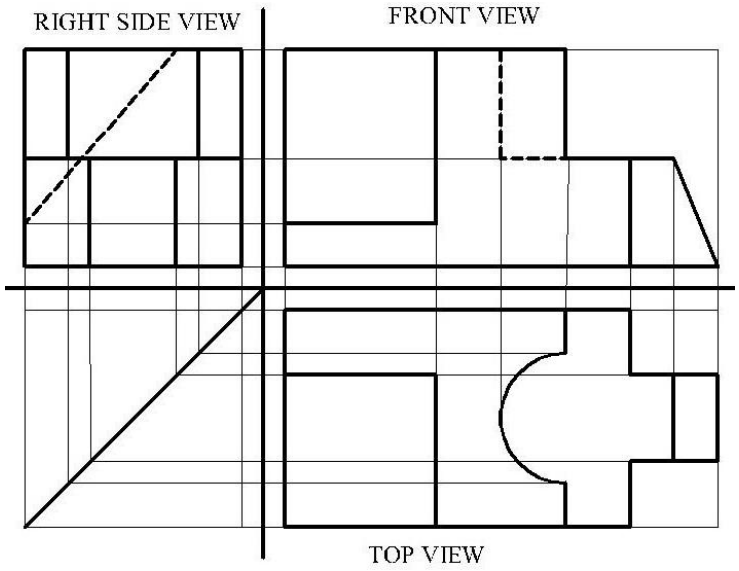
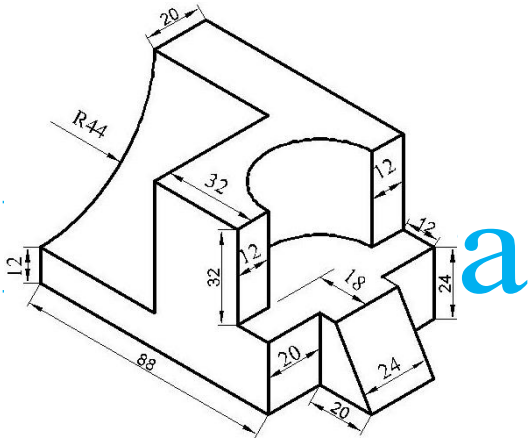

RIGHT SIDE VIEW
FRONT VIEW
TOP VIEW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R44
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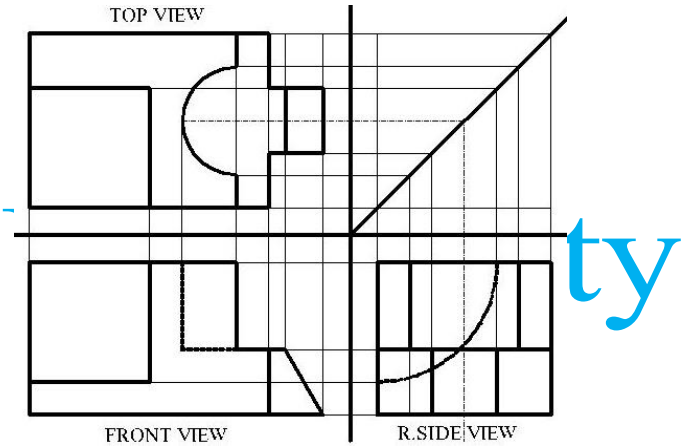
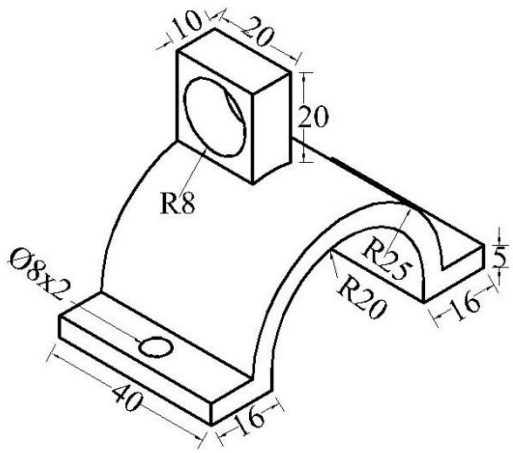

TOP VIEW
FRONT VIEW
R.SIDE VIEW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R8
Ø8x2
R25
R20
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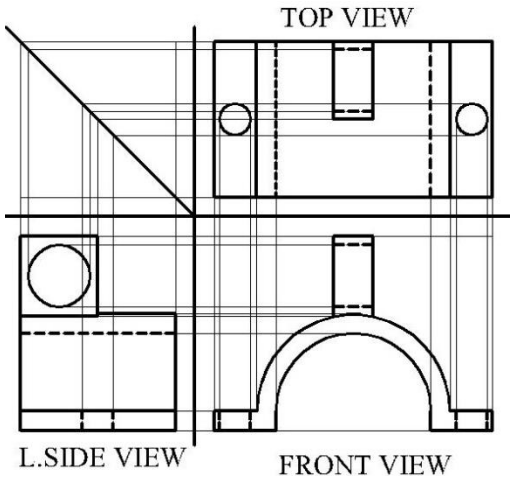
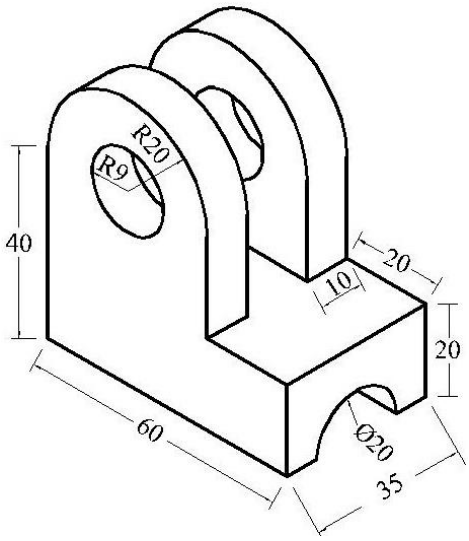

TOP VIEW
L.SIDE VIEW
FRONT VIEW


R20
R9
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Ø20
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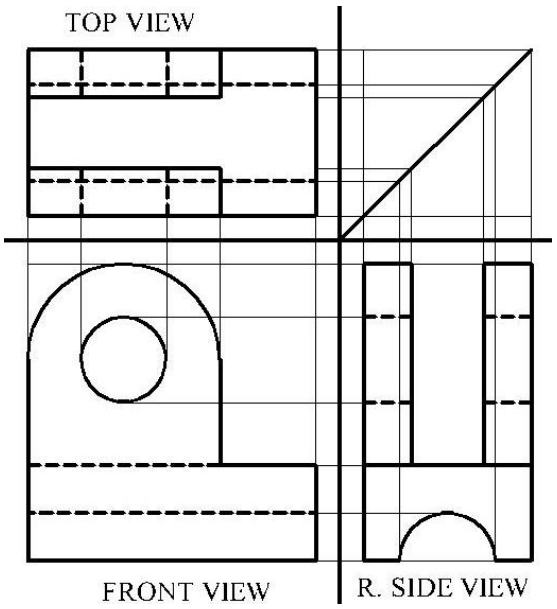
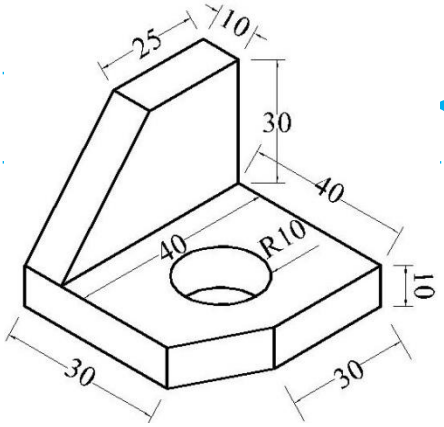

TOP VIEW
FRONT VIEW
R. SIDE VIEW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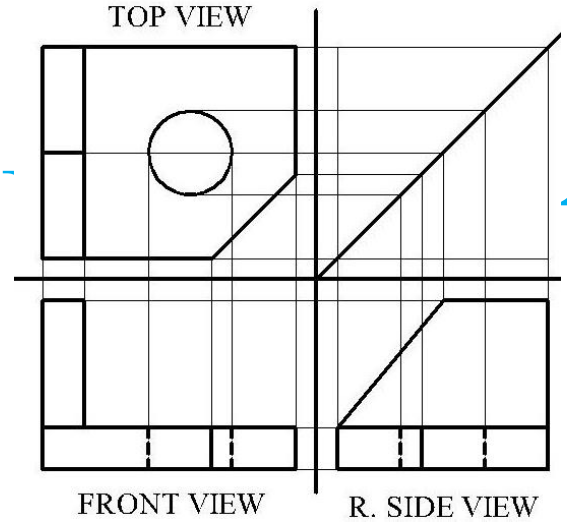
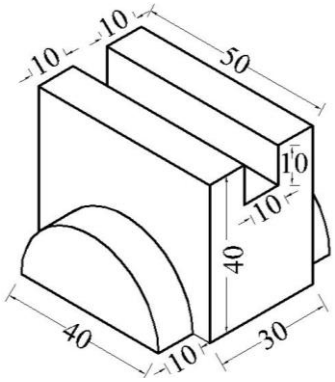

TOP VIEW
FRONT VIEW
R. SIDE VIEW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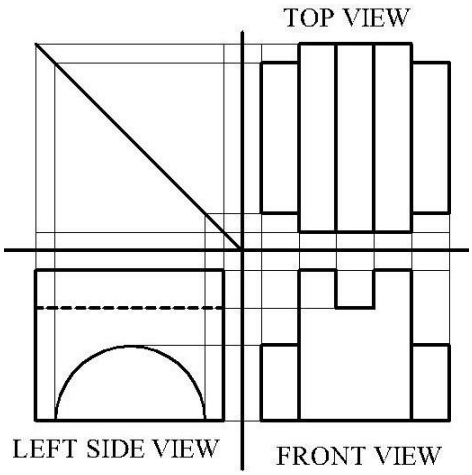
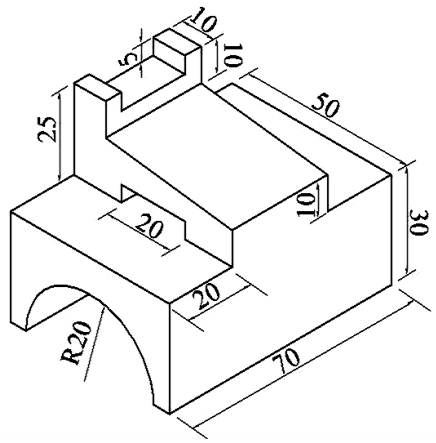

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW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R20
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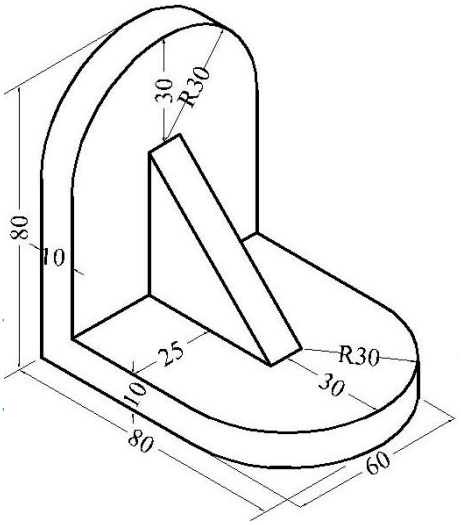
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R30
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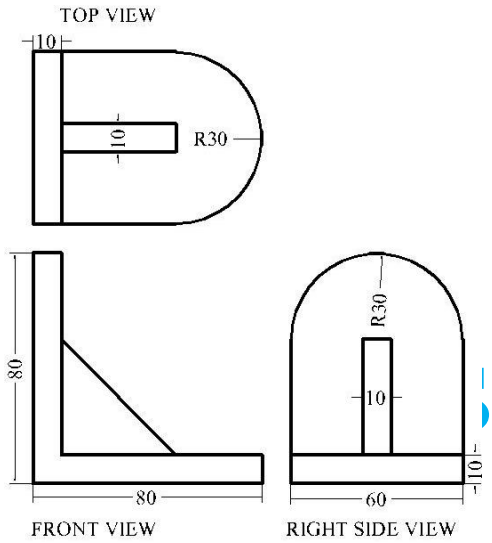
TOP VIEW
10
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R30
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FRONT VIEW
R30
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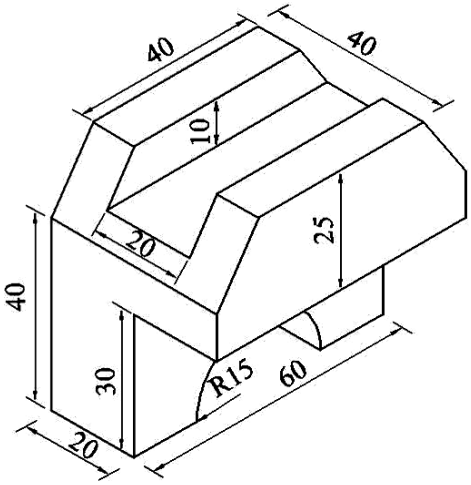
RIGHT SIDE VIEW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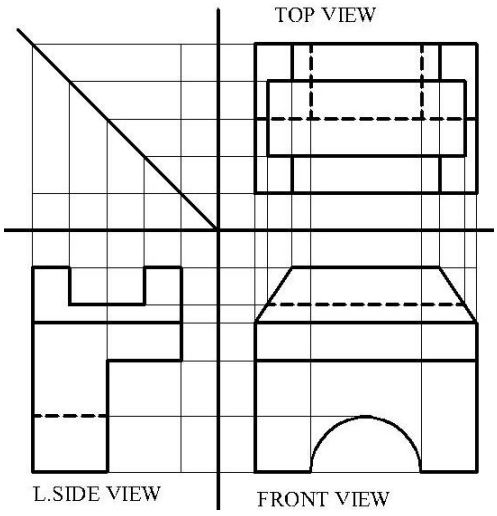
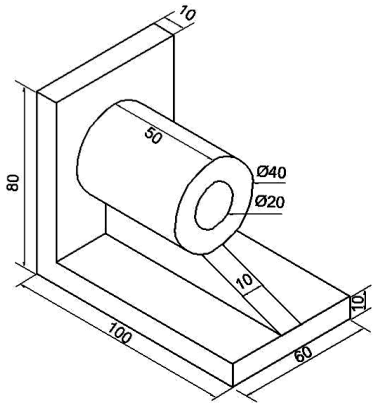

TOP VIEW
L.SIDE VIEW
FRONT VIEW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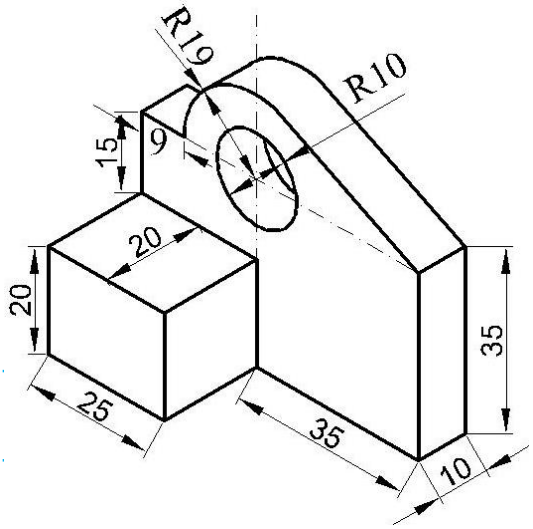
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R10
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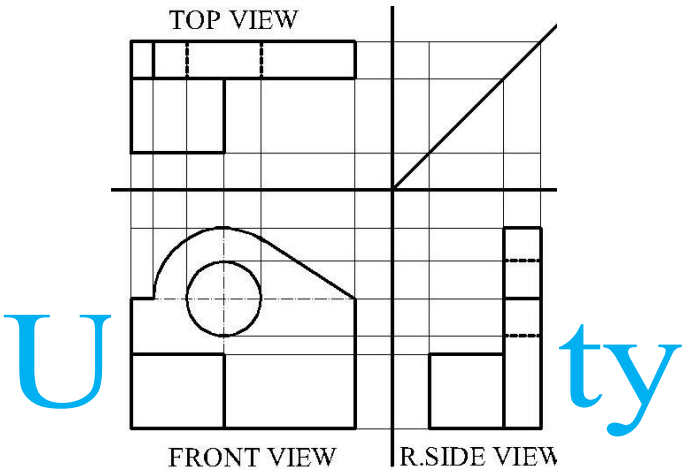
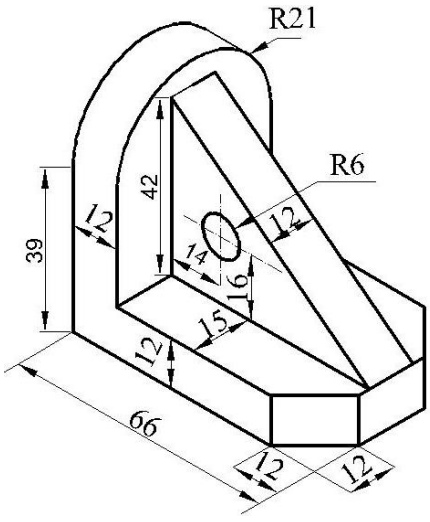

TOP VIEW
FRONT VIEW
R.SIDE VIEW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R6
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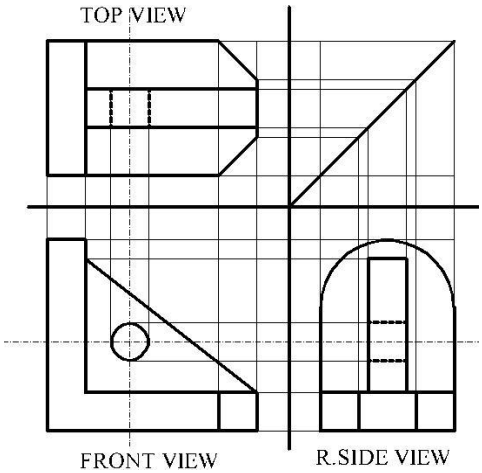
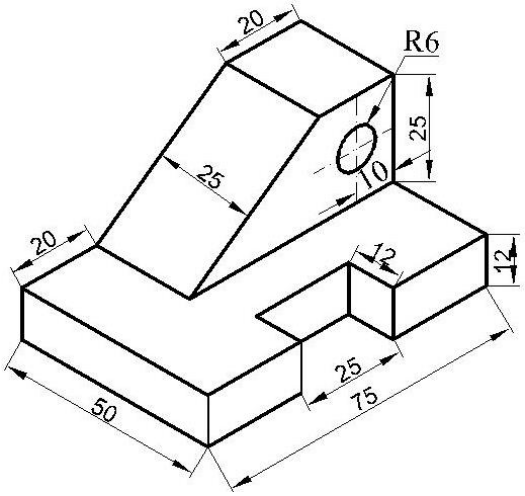

TOP VIEW
FRONT VIEW
R.SIDE VIEW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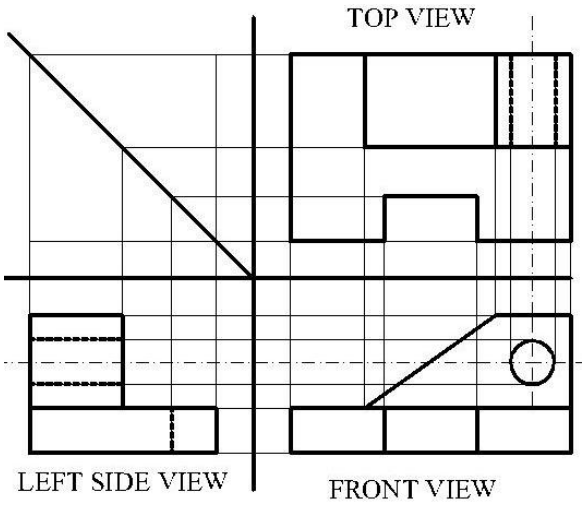
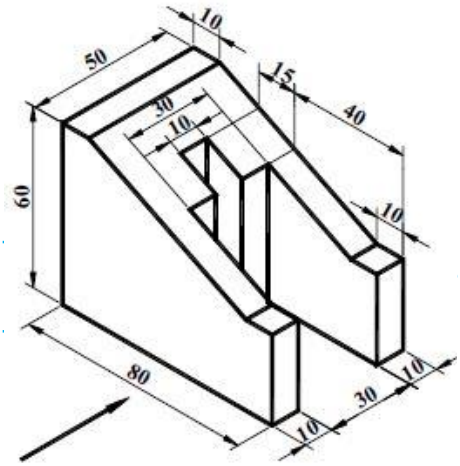

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW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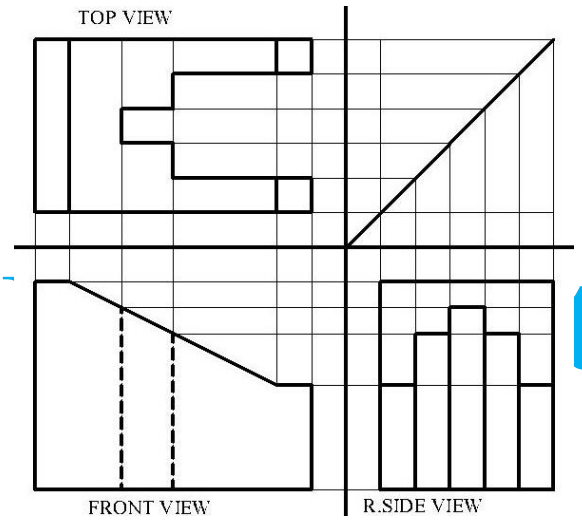
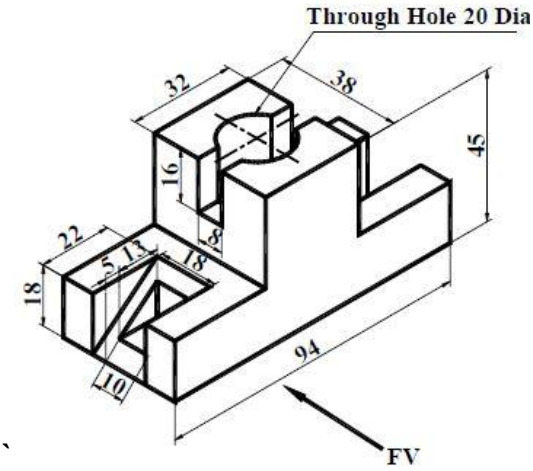

TOP VIEW
FRONT VIEW
R.SIDE VIEW


Through Hole 20 Dia
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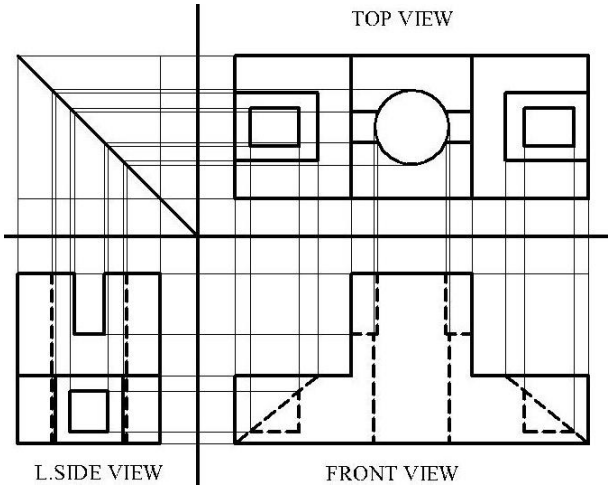
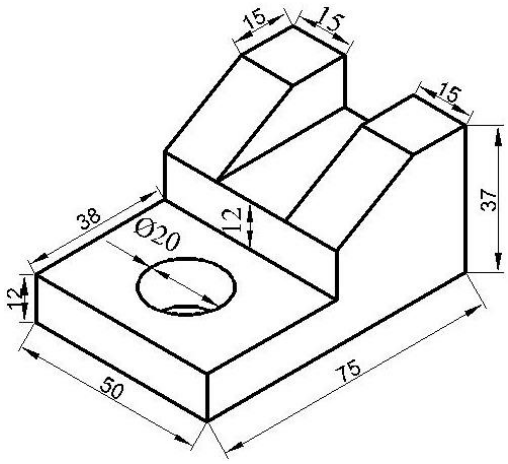
FV


TOP VIEW
L.SIDE VIEW
FRONT VIEW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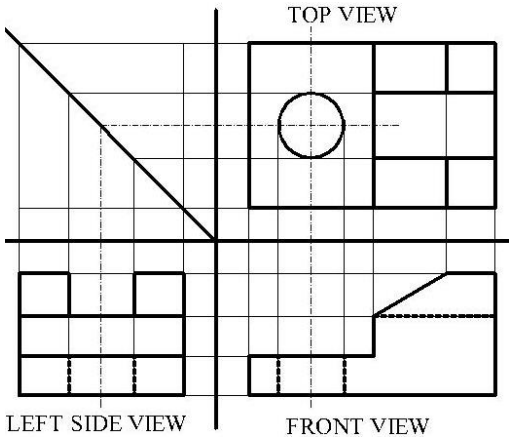
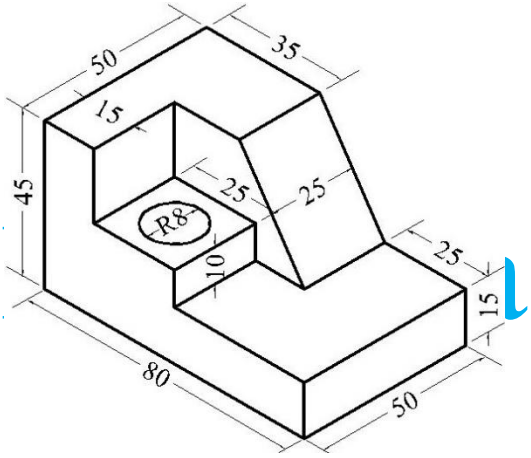

TOP VIEW
LEFT SIDE VIEW
FRONT VIEW


50
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R8
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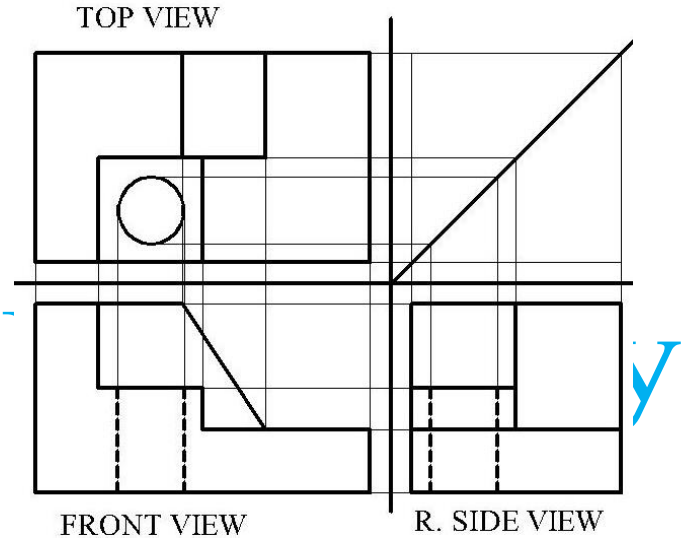
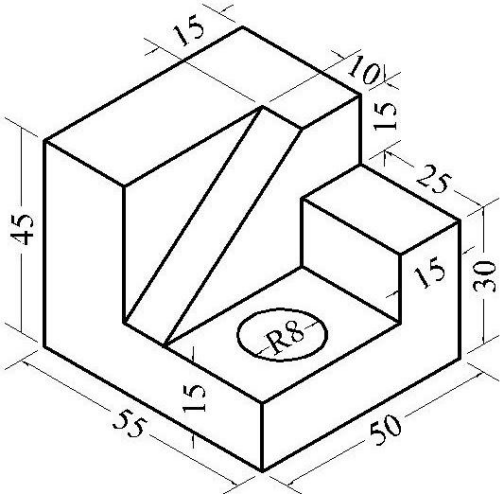
25
15
80
50


TOP VIEW
FRONT VIEW
R. SIDE VIEW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R8
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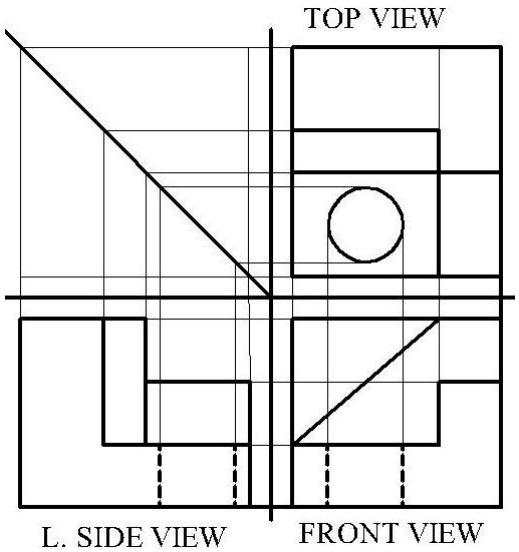
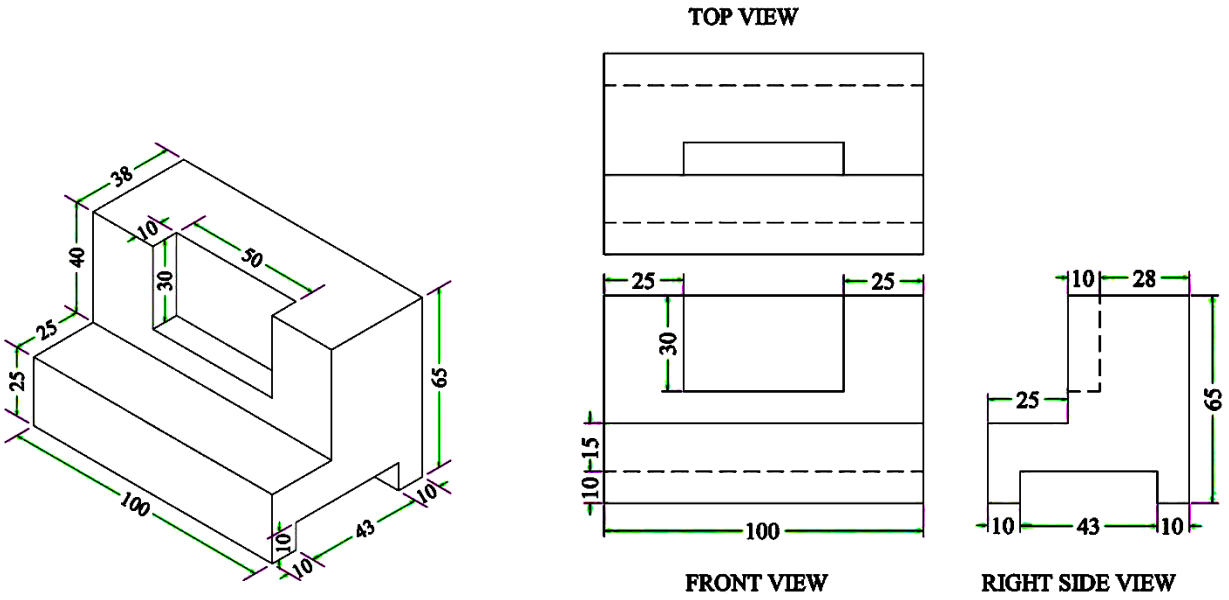
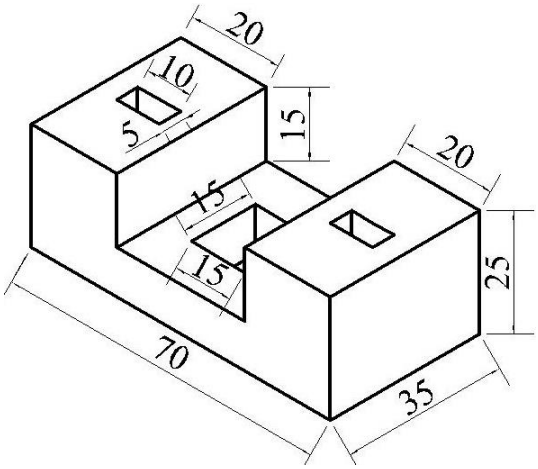
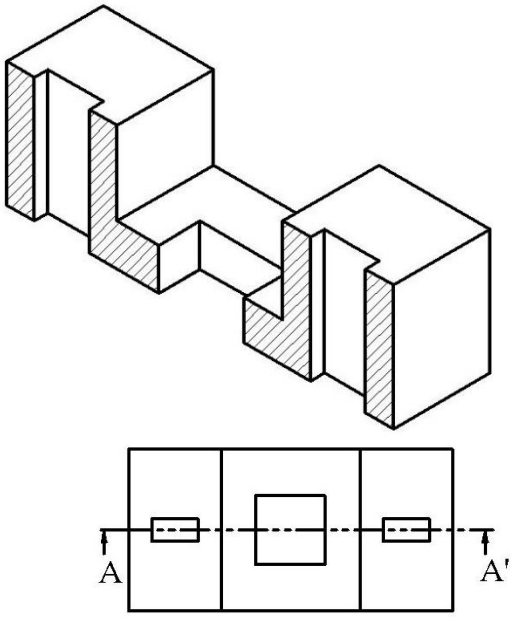

TOP VIEW
L. SIDE VIEW
FRONT VIEW

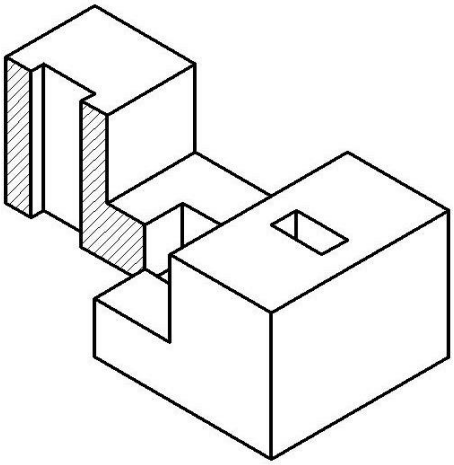


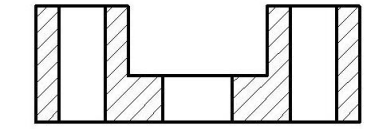
Pokhara University

Draw full sectional and half sectional front views of the given solid figures

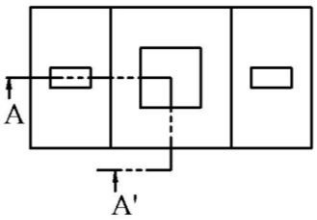


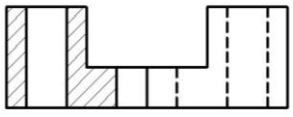




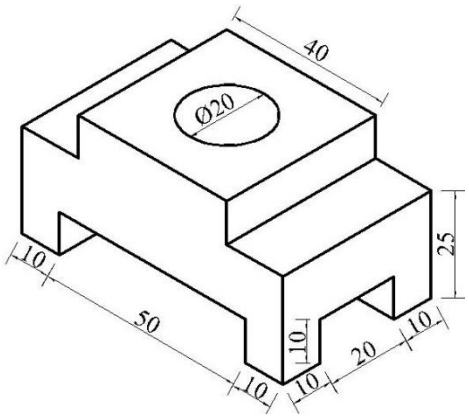


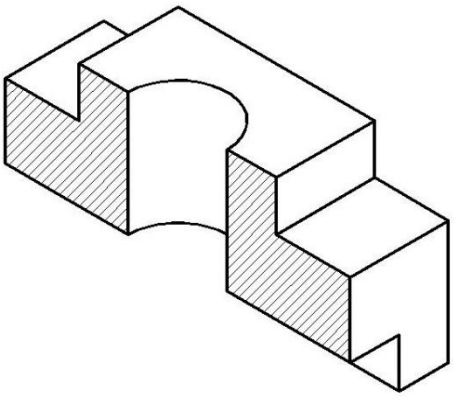
FULL SECTIONAL
FRONT VIEW AT AA

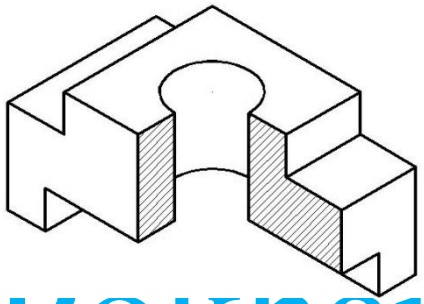


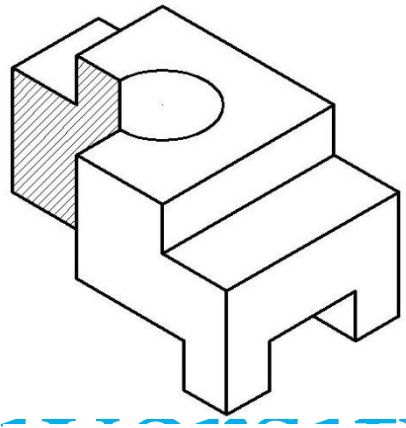


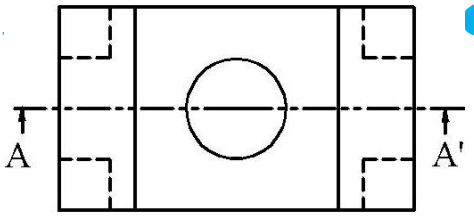
HALF SECTIONAL
FRONT VIEW AT AA'

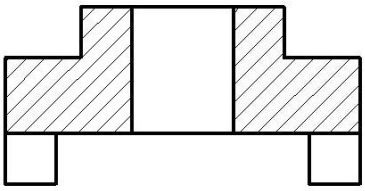




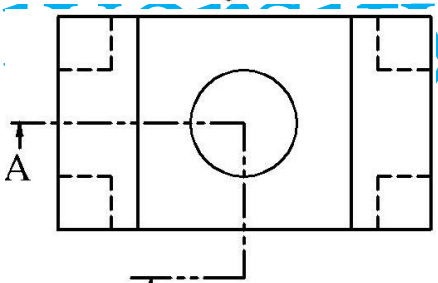


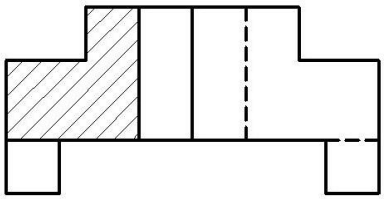




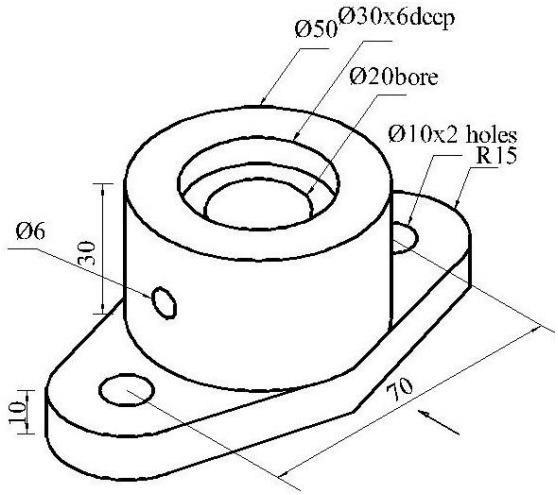


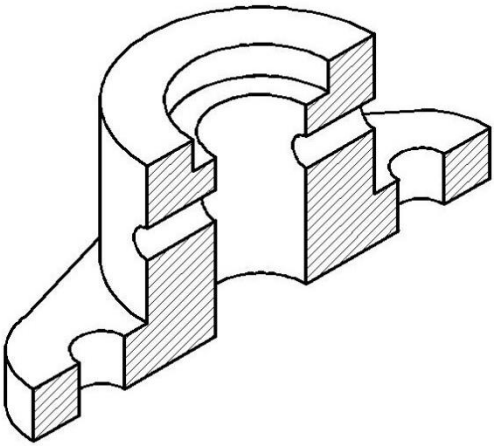
FULL SECTIONAL
FRONT VIEW AT AA'

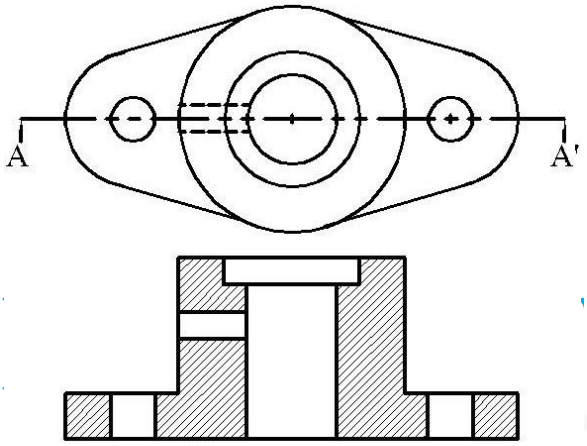




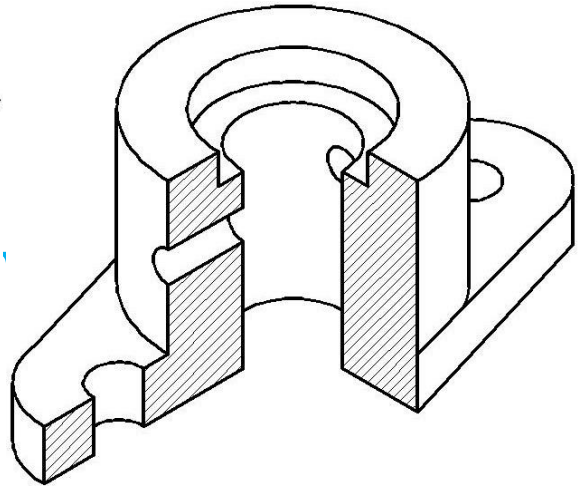
HALF SECTIONAL
FRONT VIEW AT AA

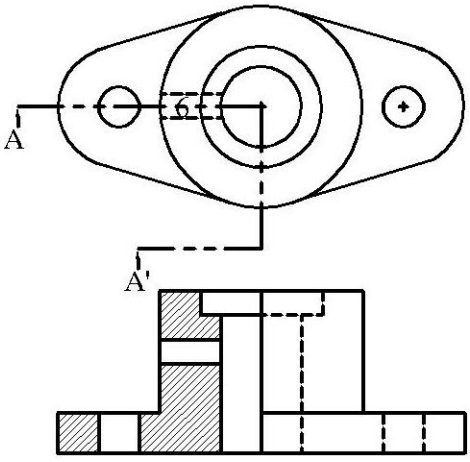




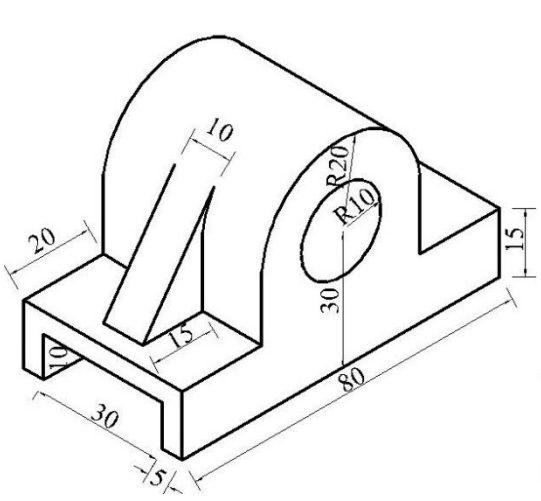


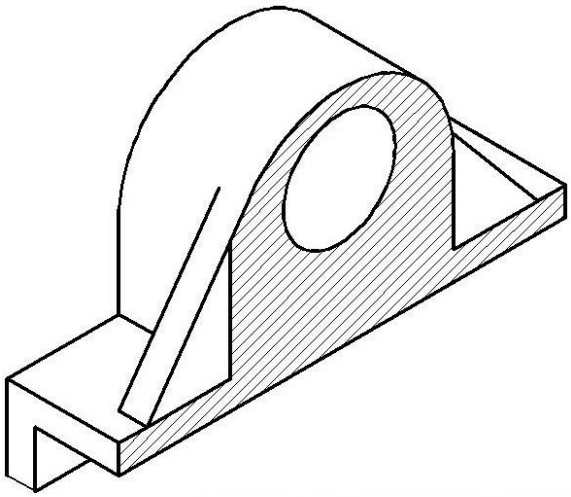
FULL SECTIONAL FRONT VIEW AT AA'

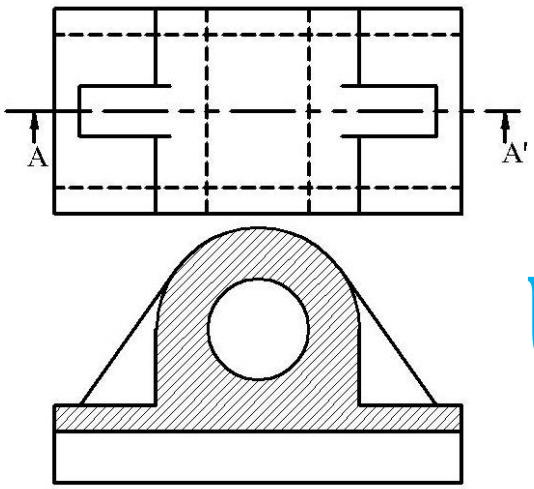




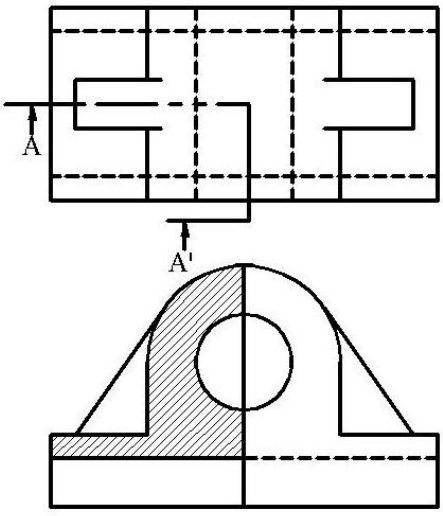
HALF SECTIONAL FRONT VIEW AT AA'





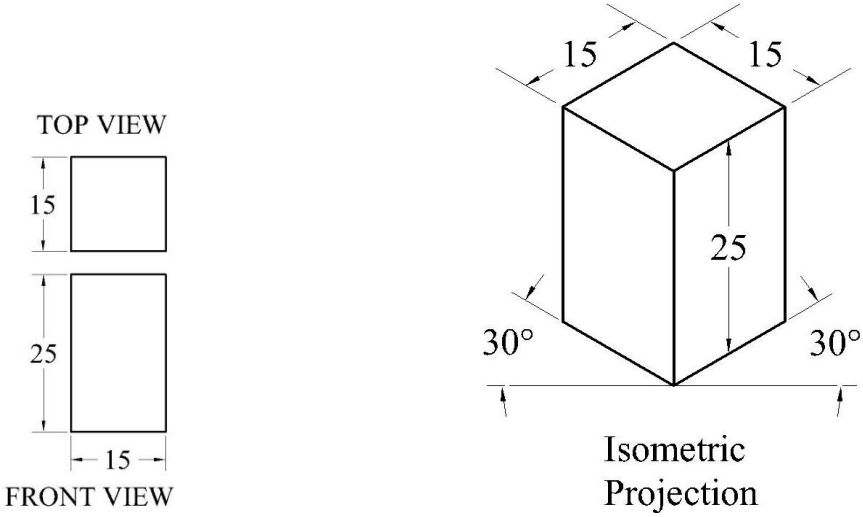


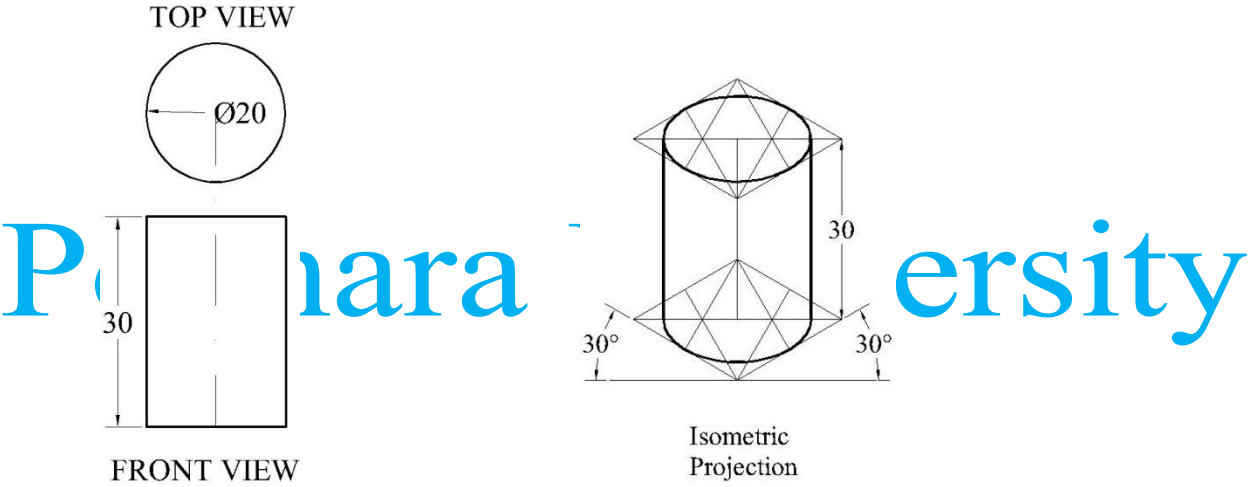
FULL SECTIONAL FRONT VIEW AT AA'

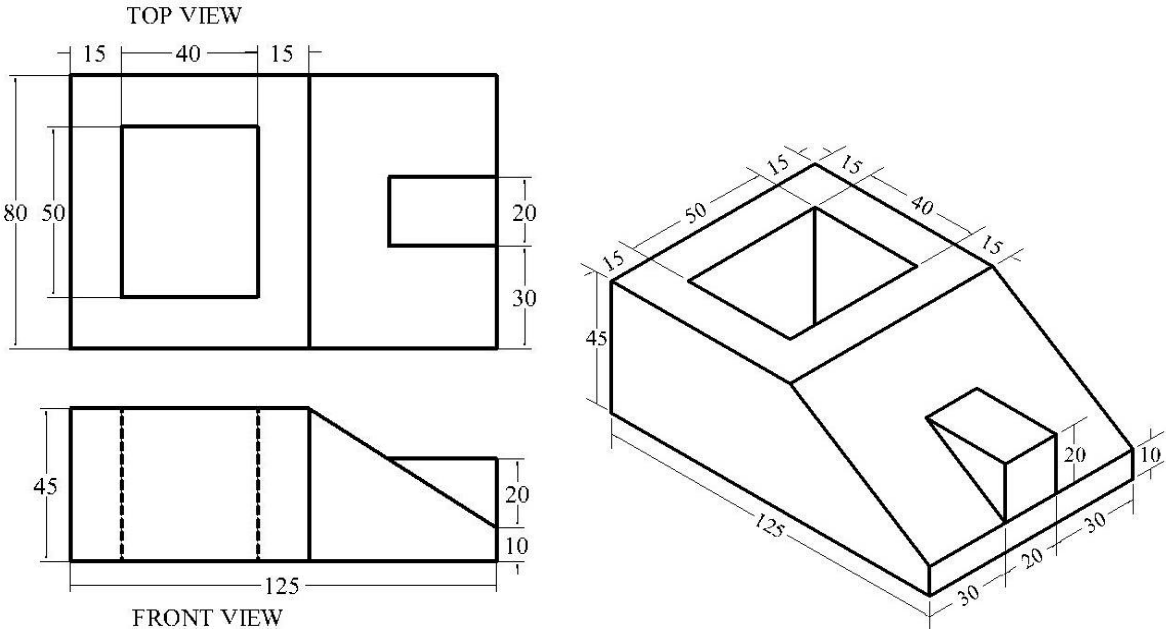


HALF SECTIONAL FRONT VIEW AT AA'

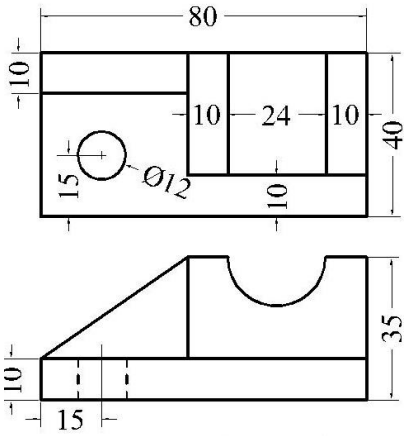
Draw an isometric projection from the given views.





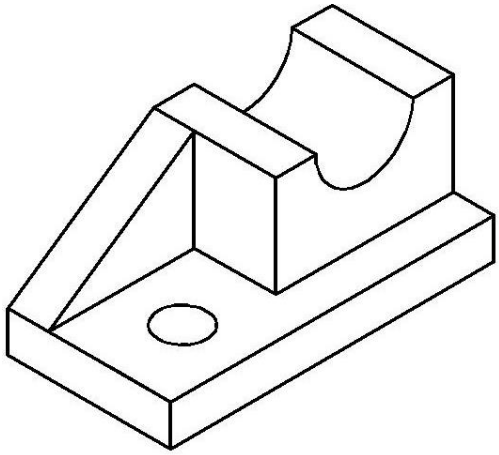


TOP VIEW

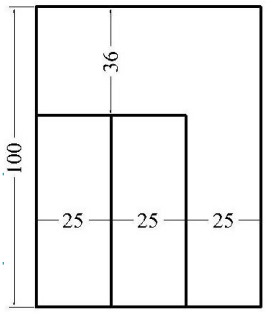


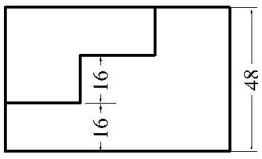
FRONT VIEW

Isometric Projection

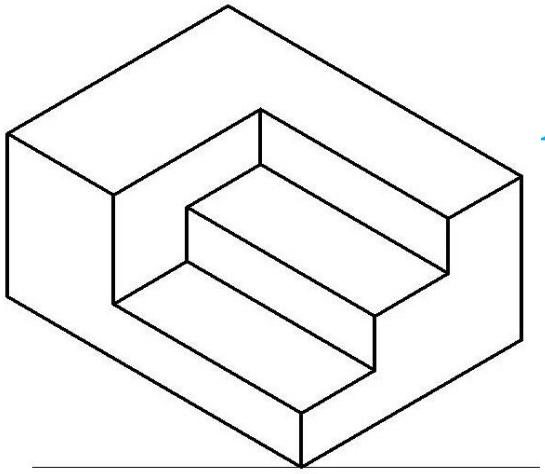


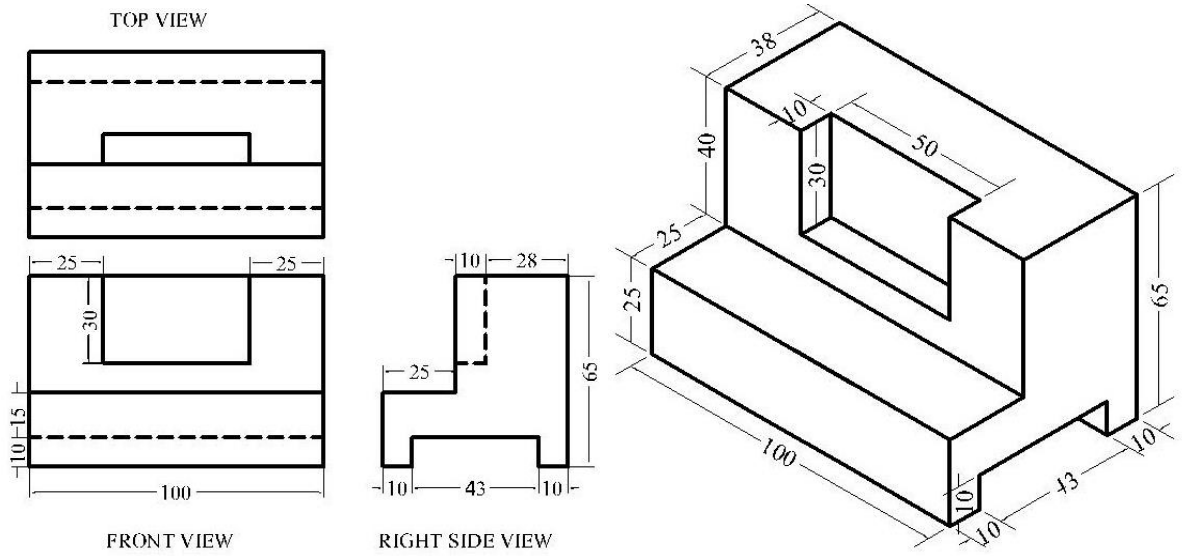
TOP VIEW

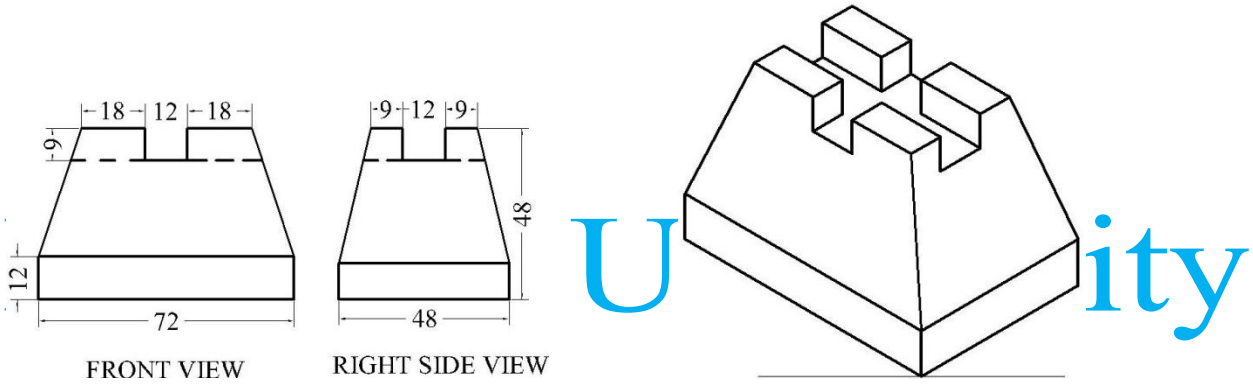




FRONT VIEW

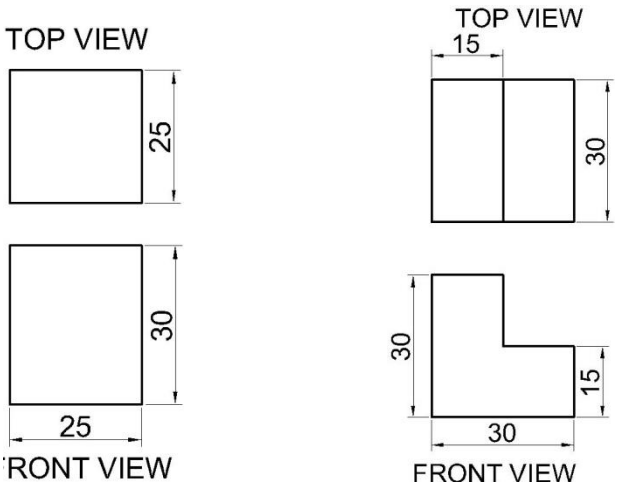




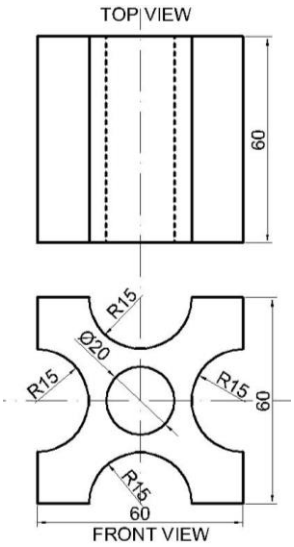


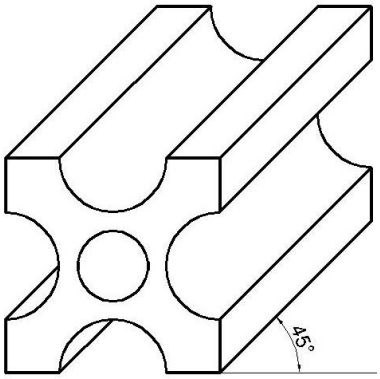
Isometric Projection

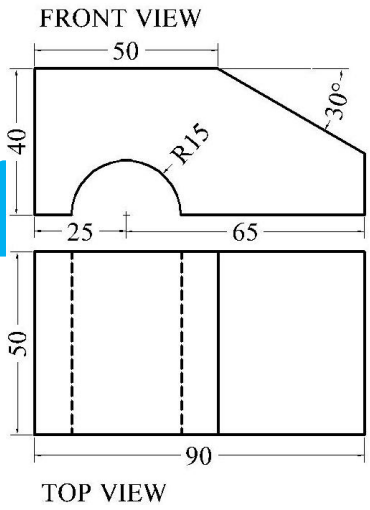
Perspective projection

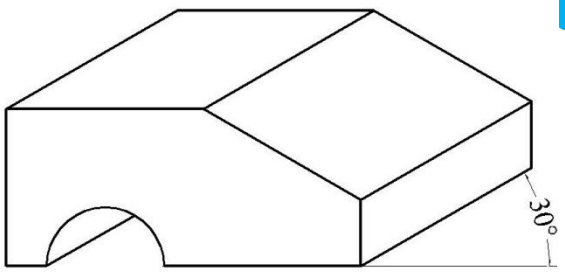


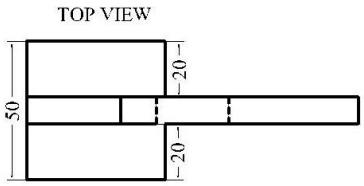
Oblique projection

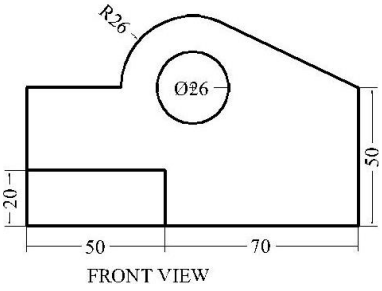


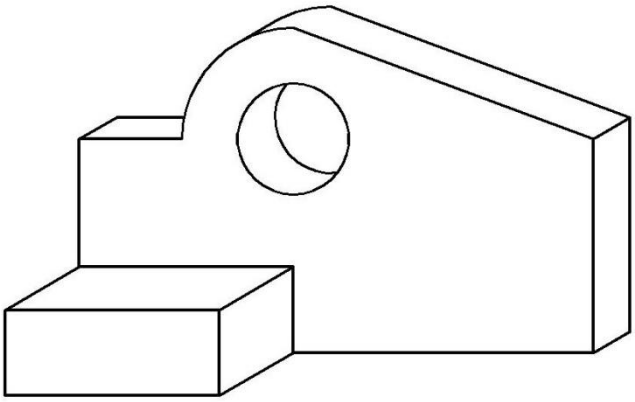




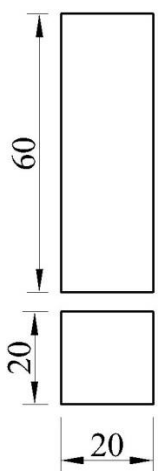


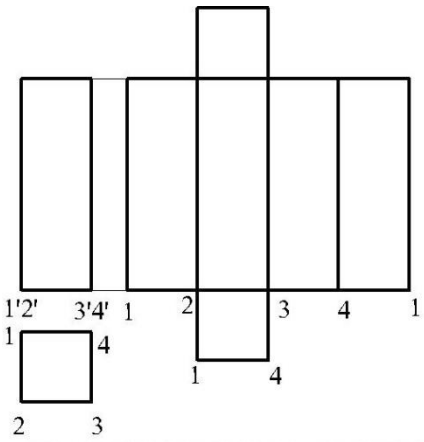




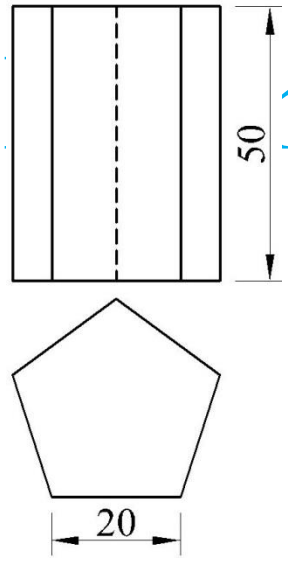


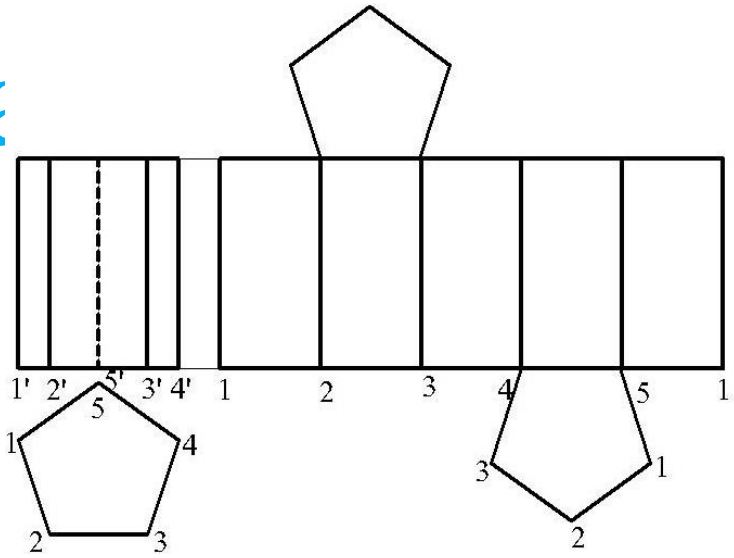
Reproduced the given views of the right prism, pyramid and cone, and draw complete surface development.

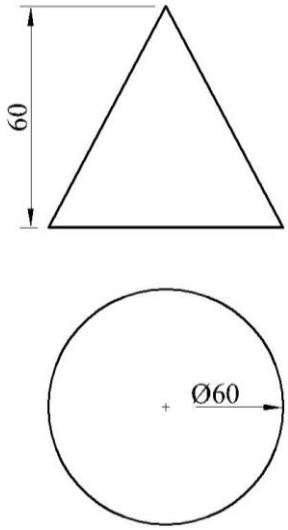


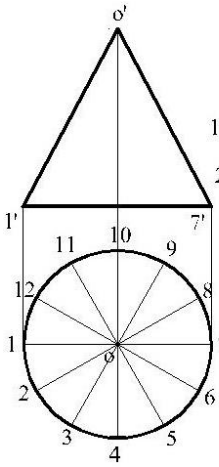


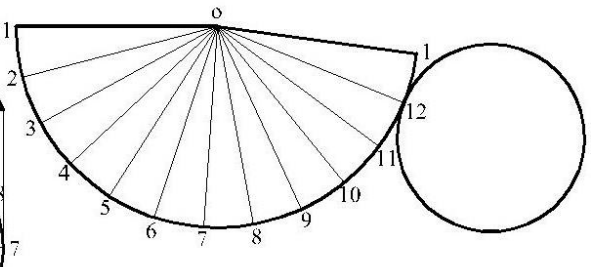
COMPLETE SURFACE DEVELOPMENT

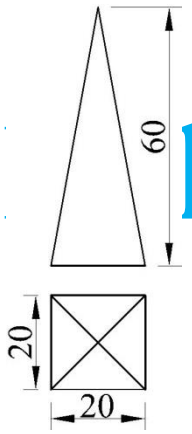


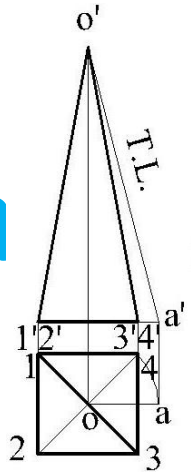


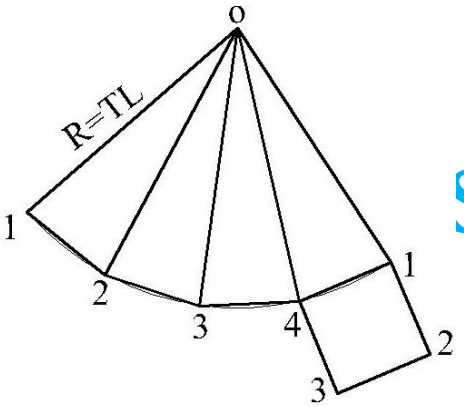

60
Ø60

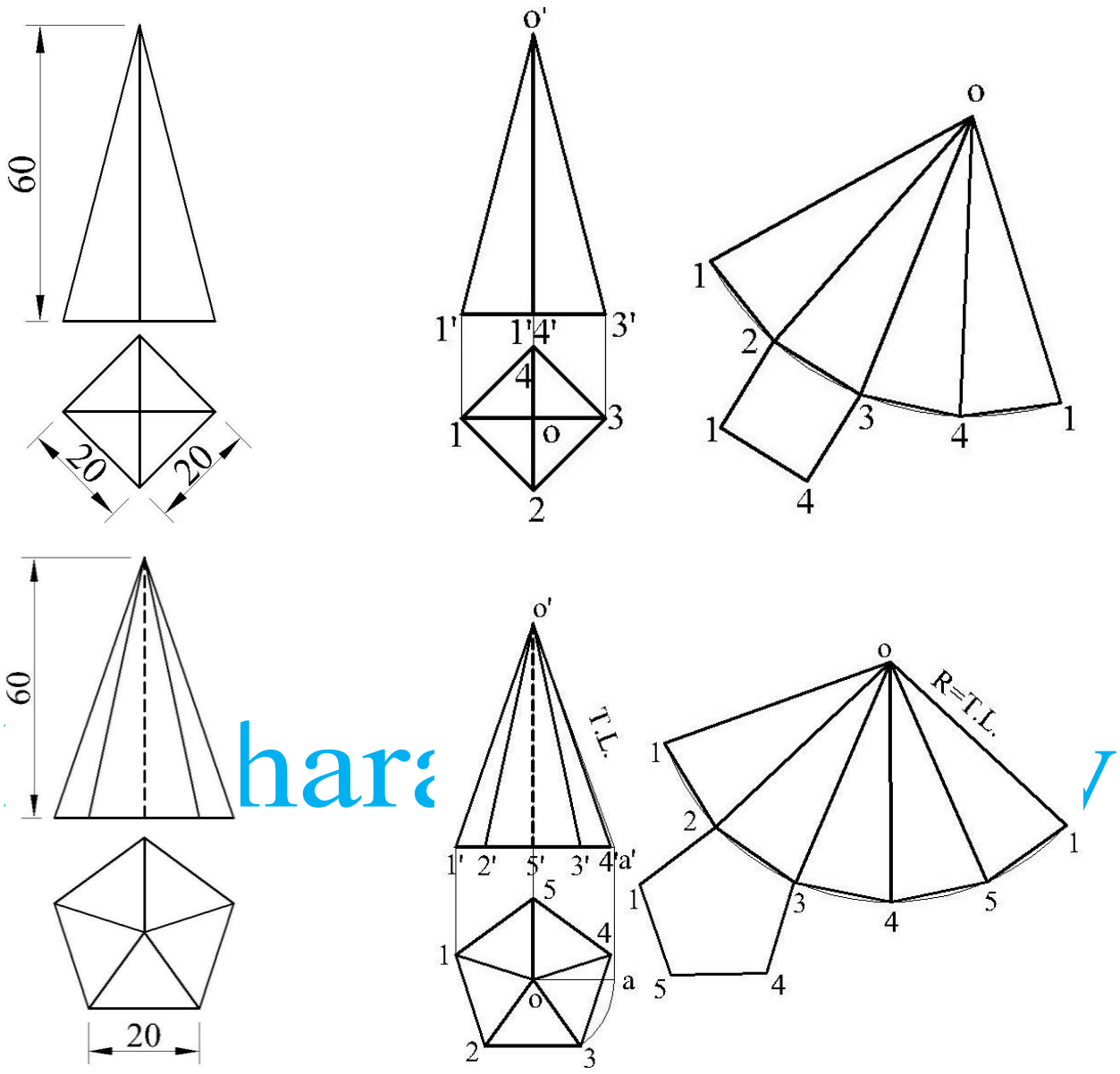

o'
1'
7'
11
10
9
12
8
1
7
2
6
3
4
5
o


o
1
2
3
4
5
6
7
8
9
10
11
12
1

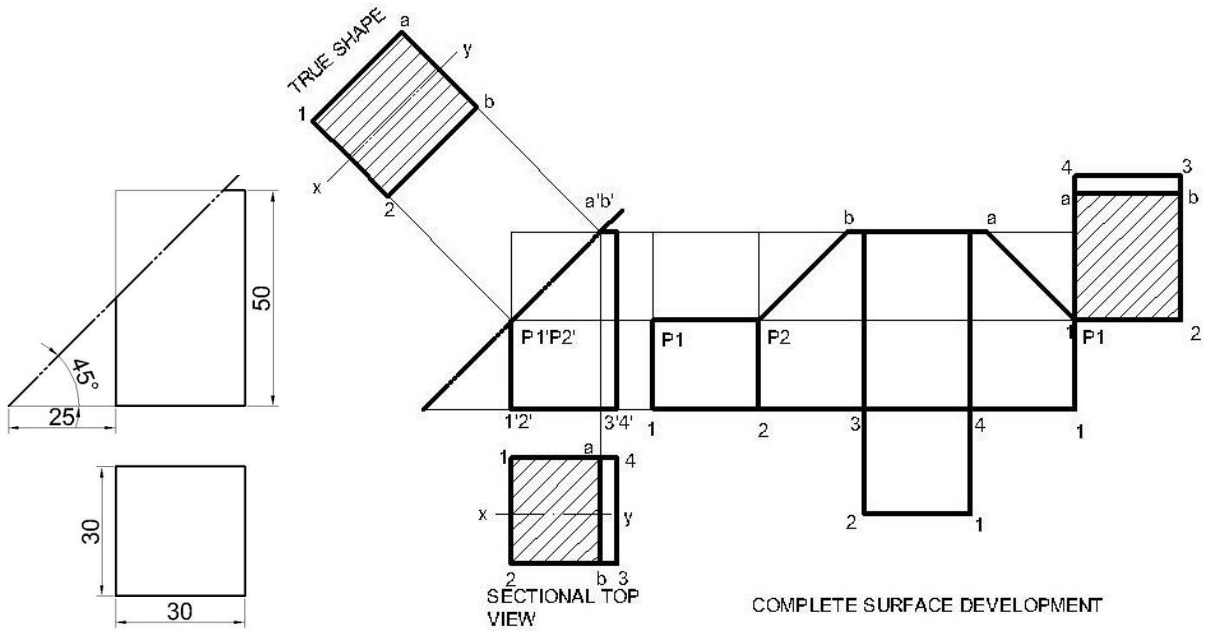

60
20
20

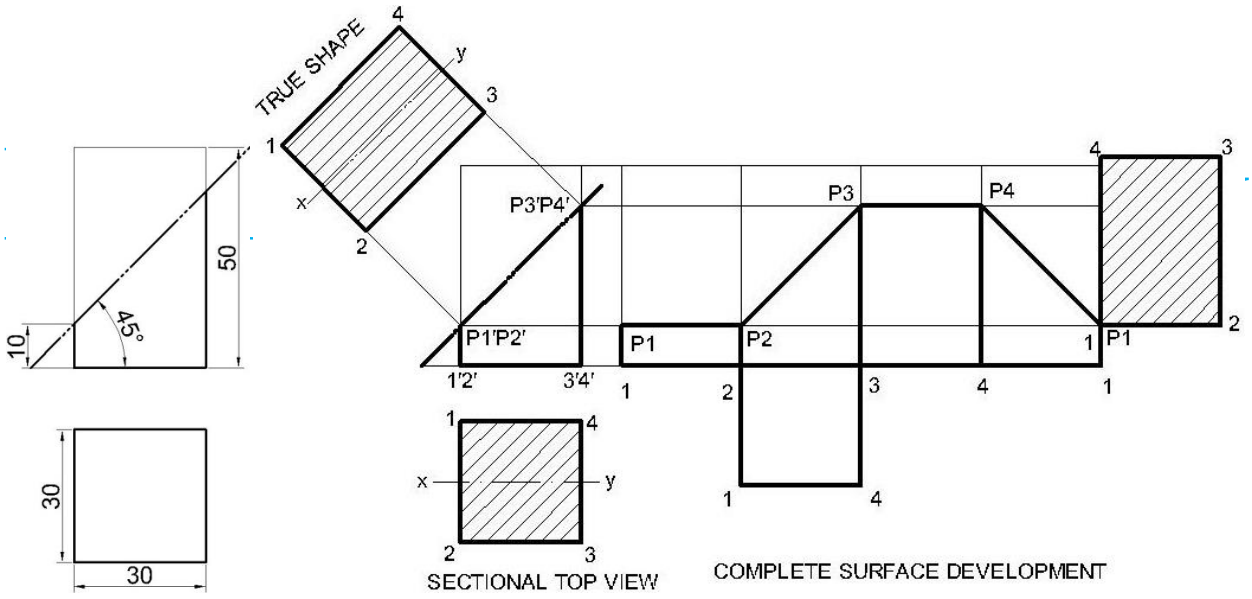

o'
T.L.
a'
1'
2'
3'
4
1
4
o
a
2
3

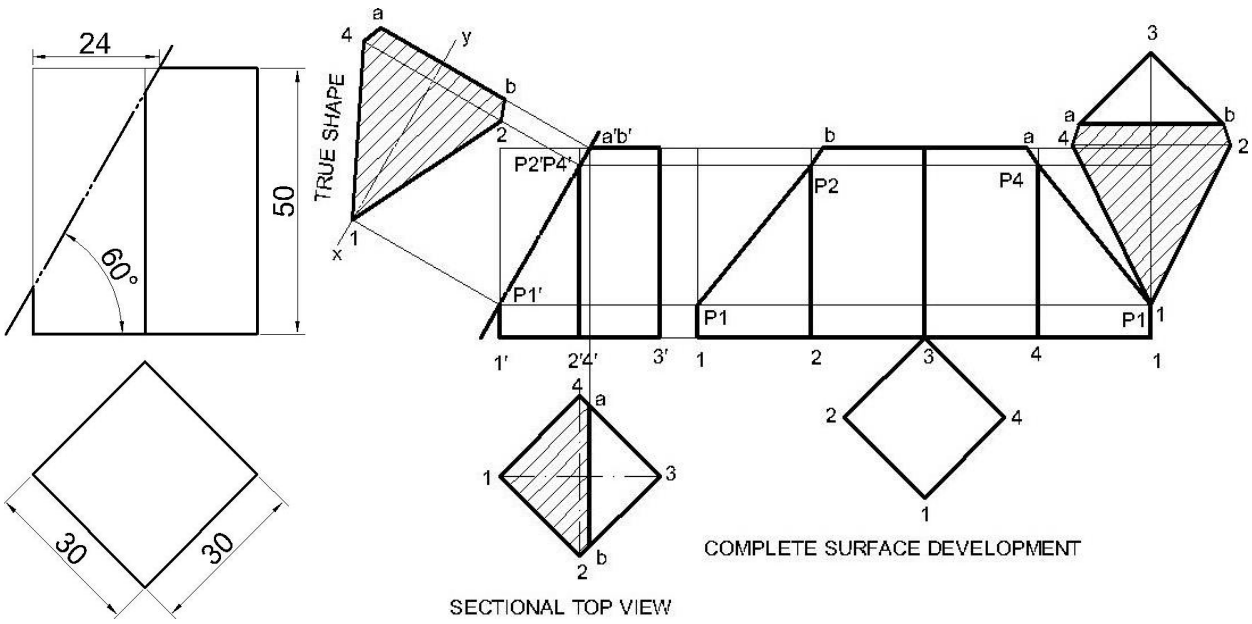

o
R=TL
1
2
3
4
1
2
3

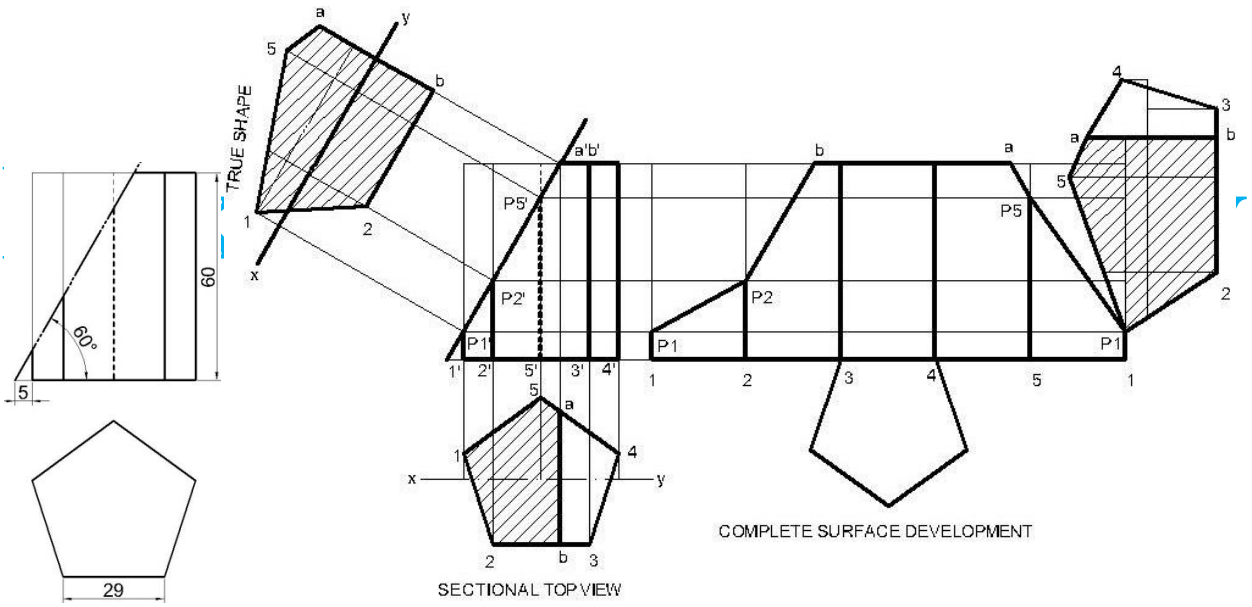


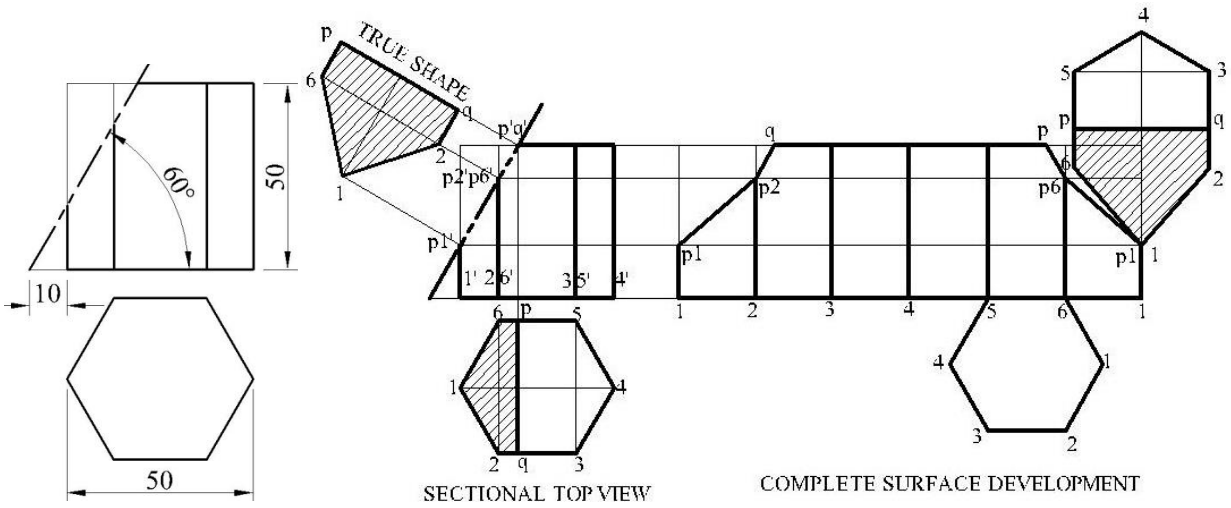
If a cutting plane cuts the given objects in to given position,as shown in figures.Reproduced the given views of the objects and draw complete surface development and also draw the true shape of the section.

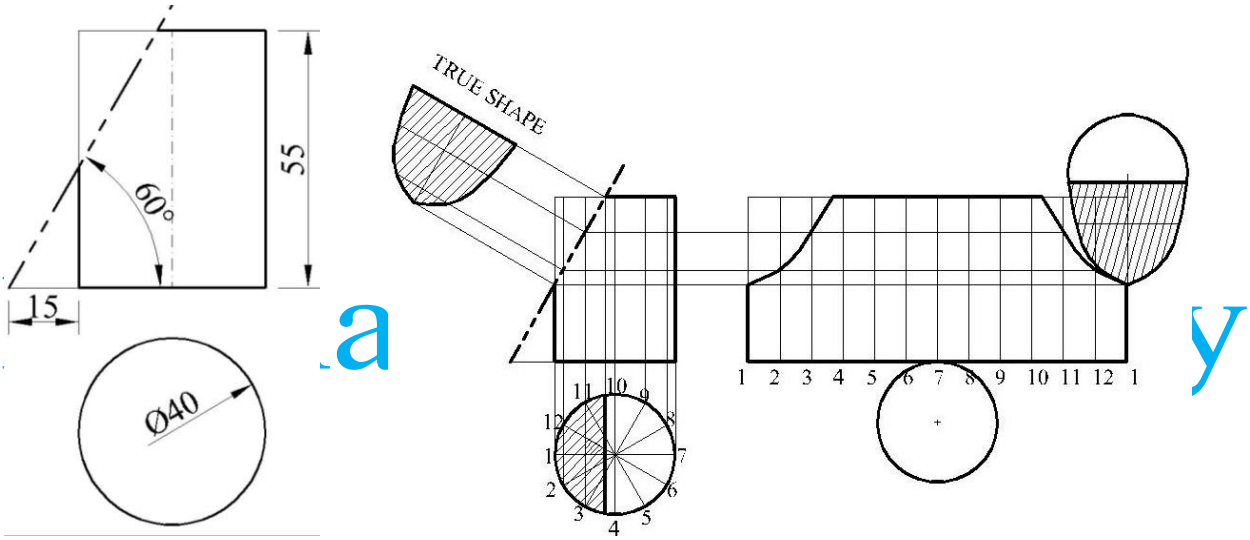

TRUE SHAPE
a
y
b
1
x
2
a'b'
50
45°
25
30
30
P1'P2'
P1
P2
1'2'
3'4'
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT

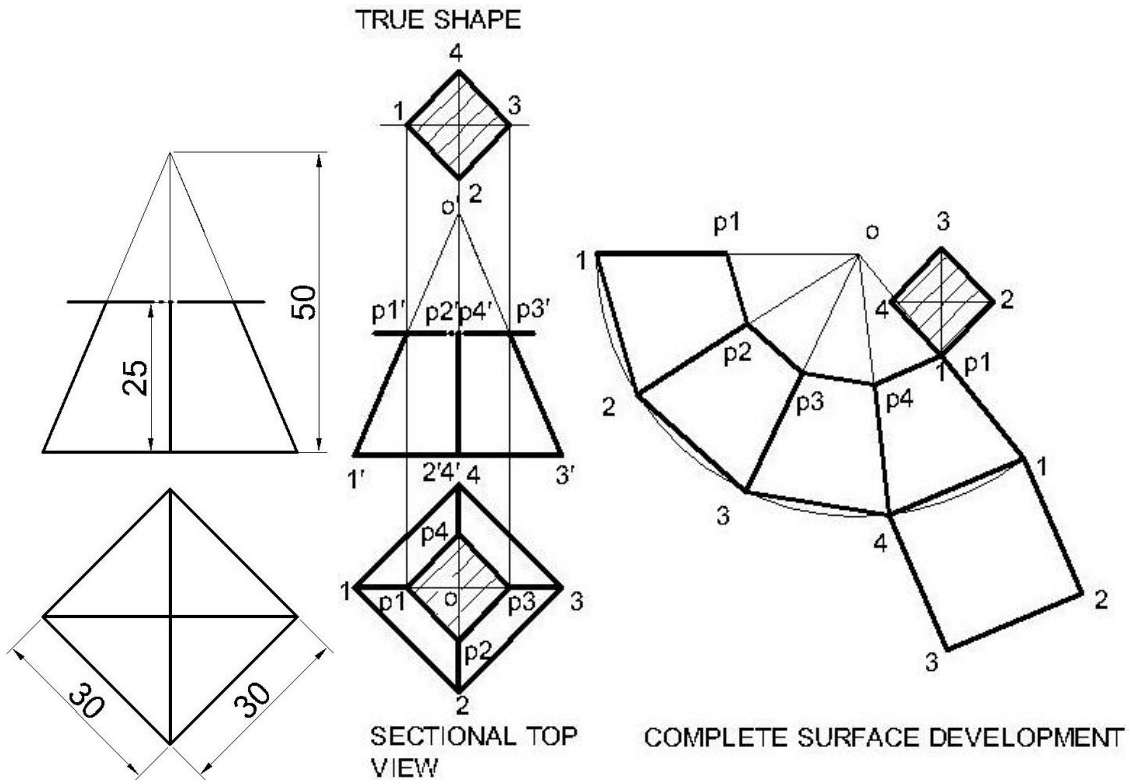

TRUE SHAPE
4
y
3
1
x
2
50
45°
10
30
30
P3'P4'
P3
P4
P1'P2'
P1
P2
1'2'
3'4'
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT

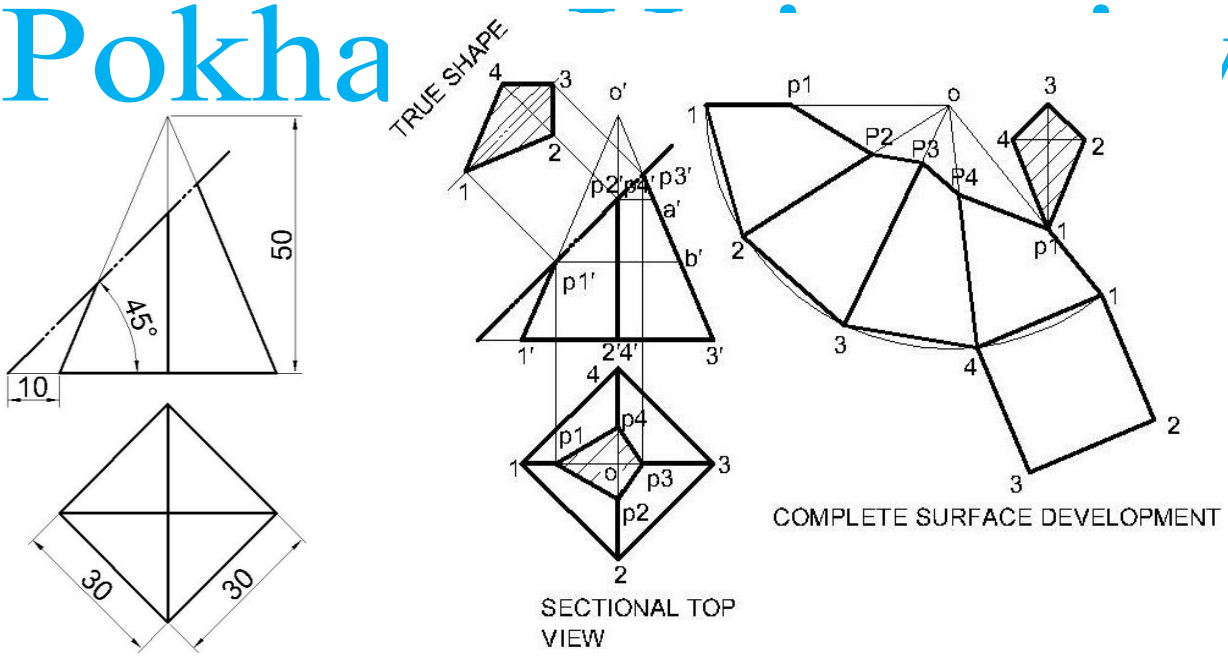

24
50
60°
30
30
TRUE SHAPE
a
b
y
x
1
2
4
a'b'
P2'P4'
P1'
1'
2'4'
3'
P1
P2
P4
3
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT

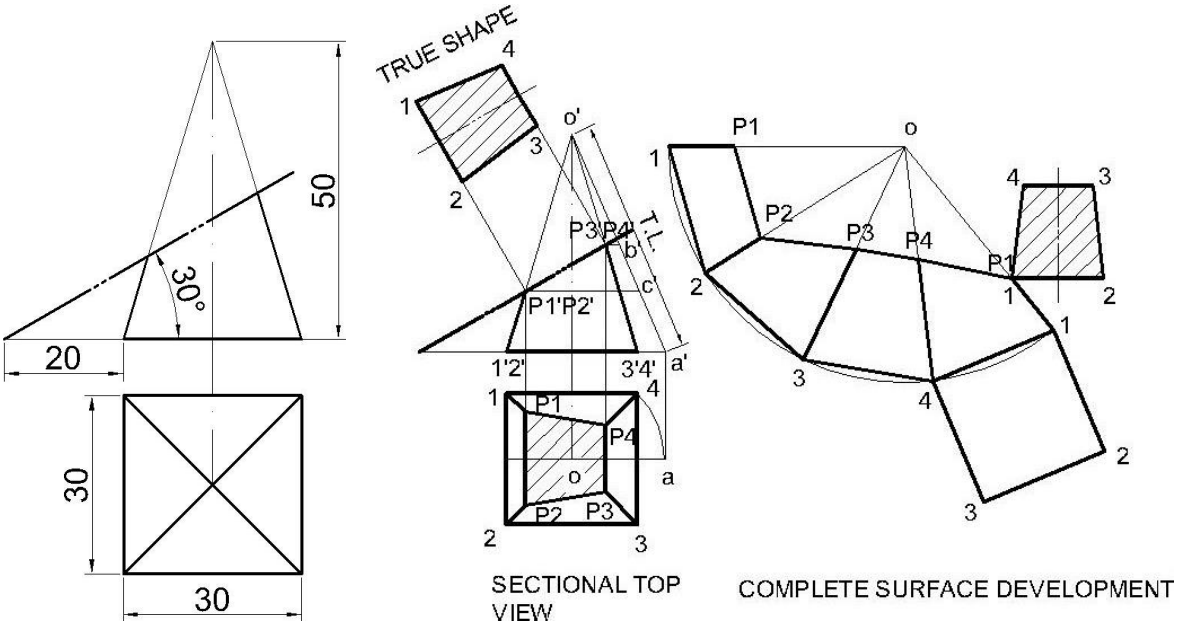

60
60°
5
29
TRUE SHAPE
a
b
y
x
1
2
5
a'b'
P5'
P2'
P1'
1'
2'
5'
3'
4'
P5
P2
P1
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT


60°
50
10
50
TRUE SHAPE
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT


60°
55
15
Ø40
TRUE SHAPE


TRUE SHAPE
50
25
30
30
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT


TRUE SHAPE
50
45°
10
30
30
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT



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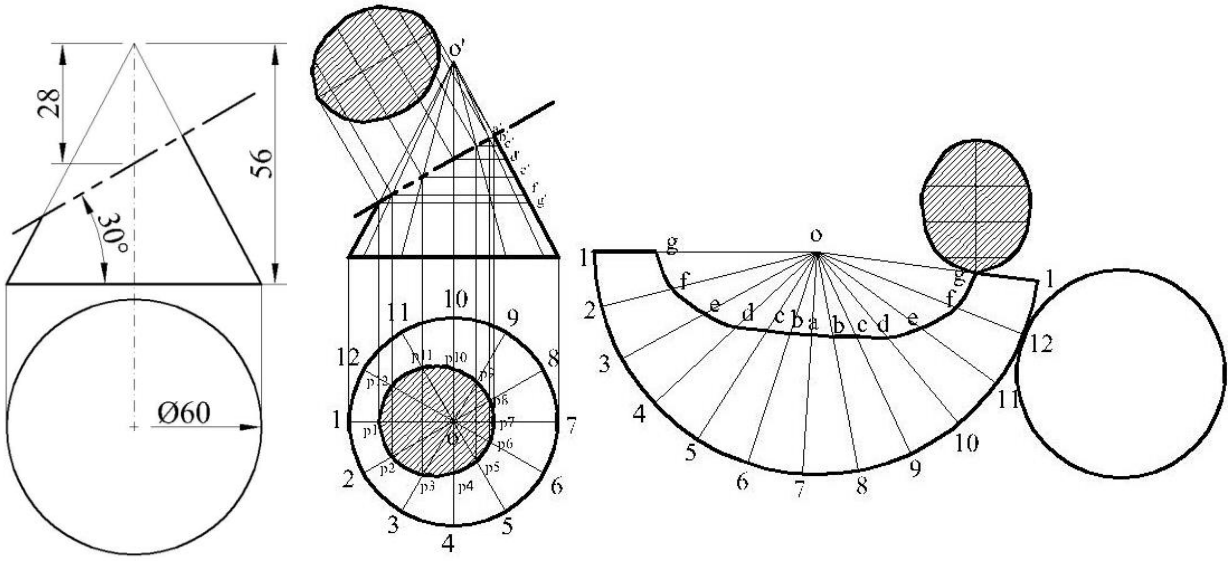
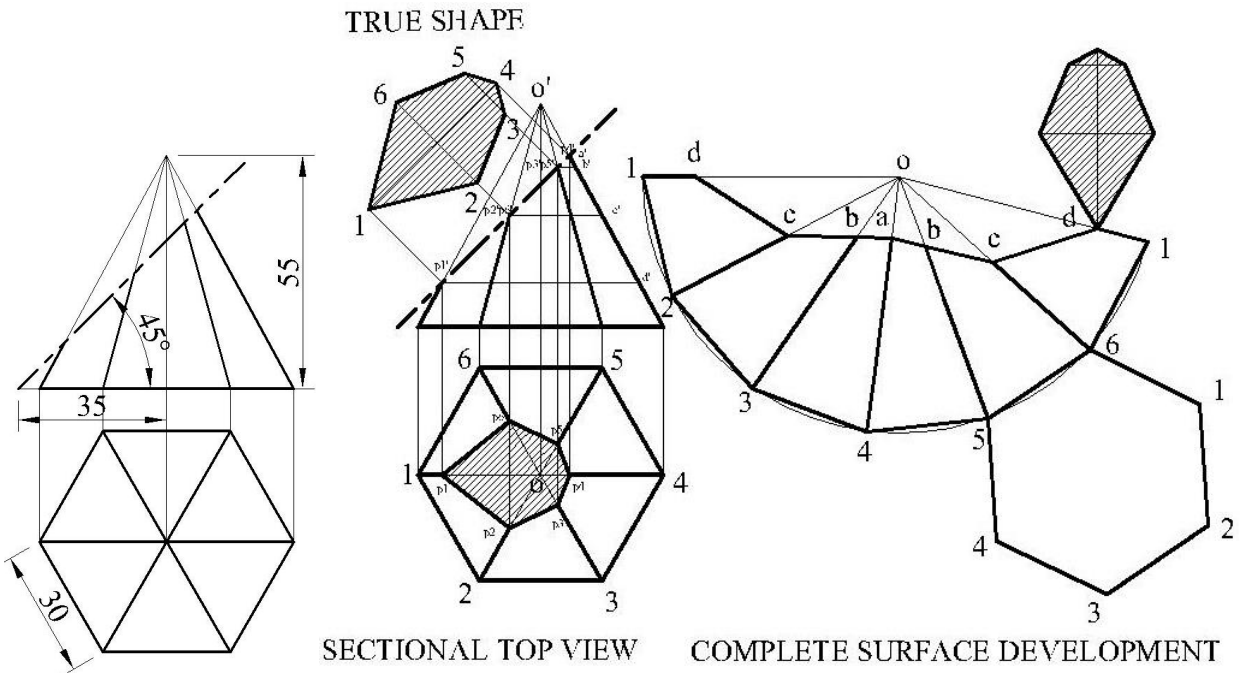
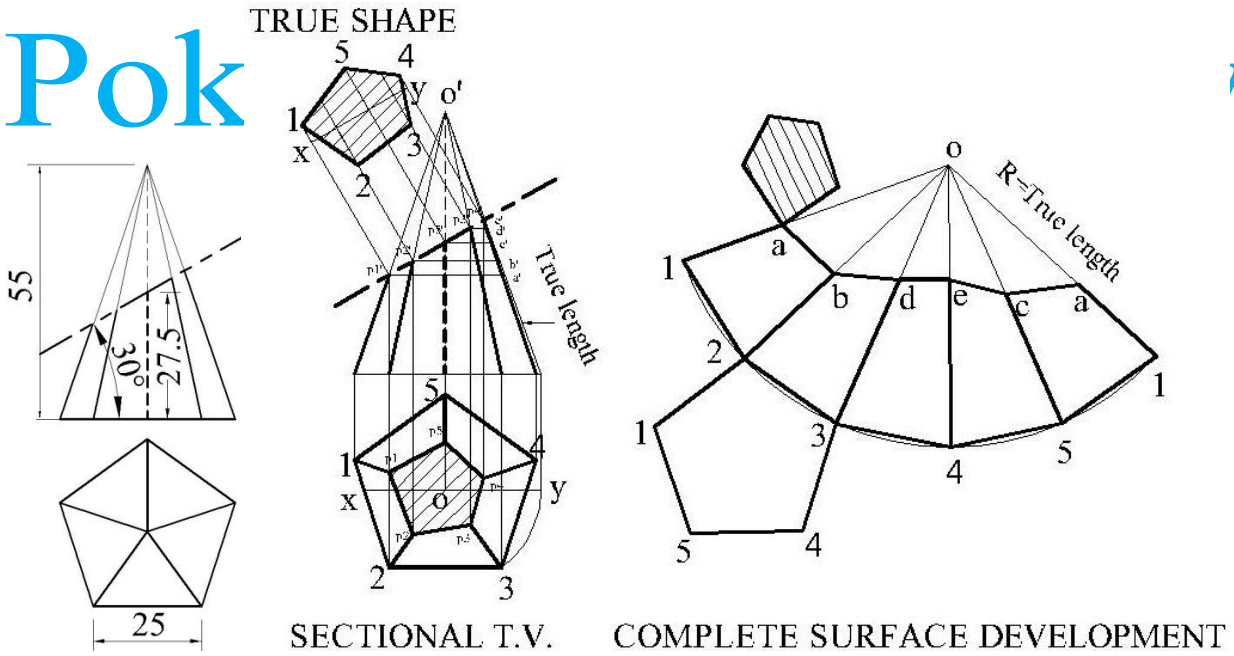
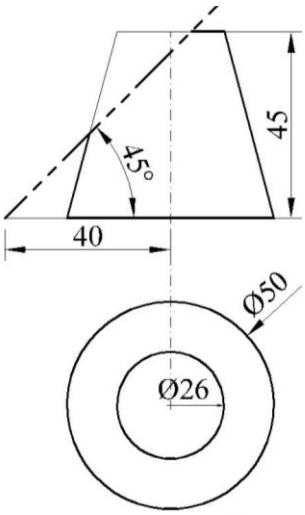
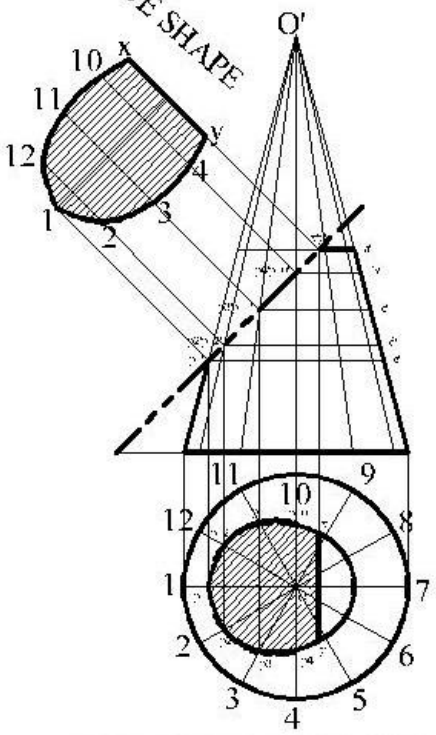



TRUE SHAPE
55
45°
35
30
SECTIONAL TOP VIEW
COMPLETE SURFACE DEVELOPMENT

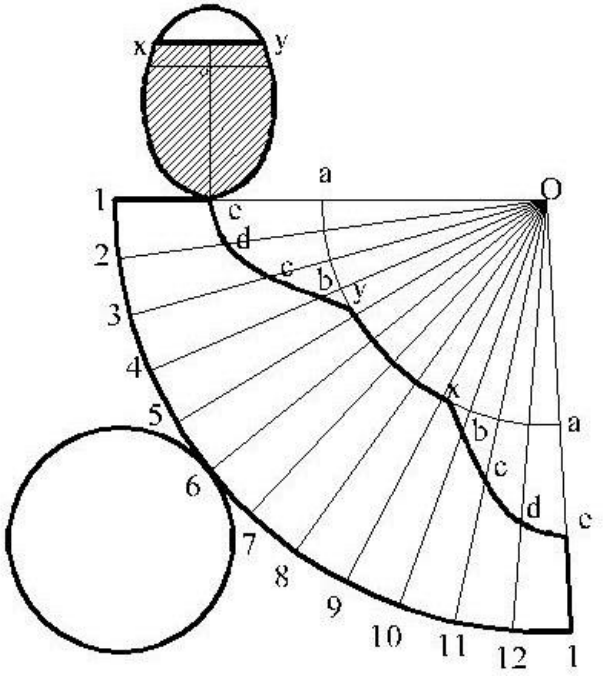

TRUE SHAPE
55
30°
27.5
25
True length
R=True length
SECTIONAL T.V.
COMPLETE SURFACE DEVELOPMENT



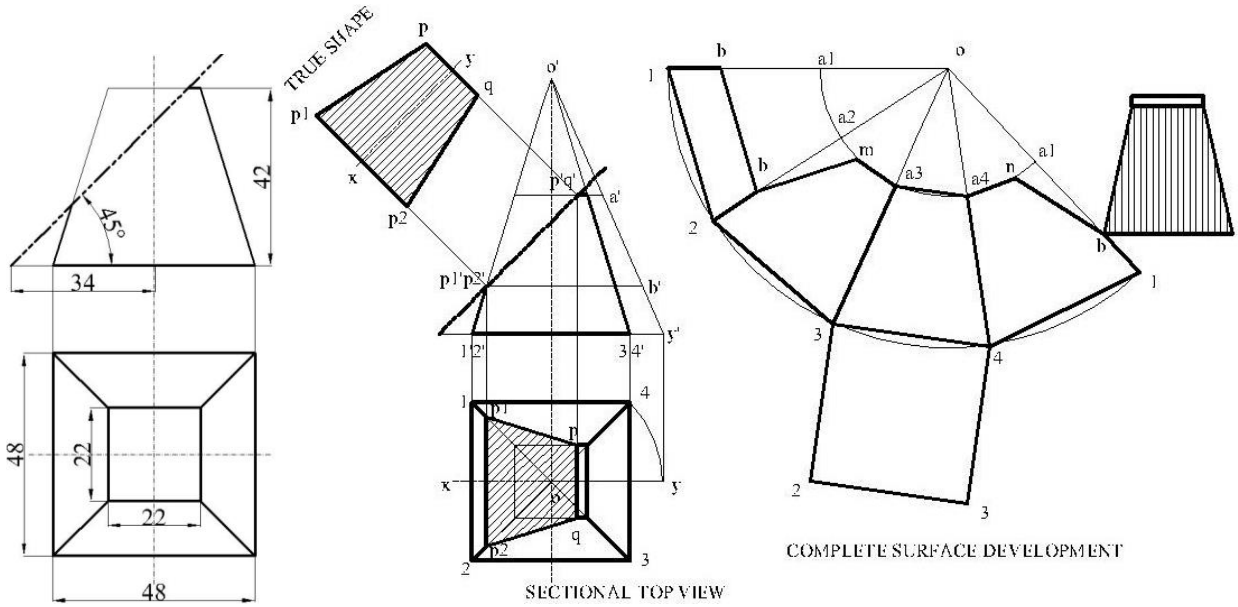
TRUE SHAPE



SECTIONAL TOP VIEW



COMPLETE SURFACE DEVELOPMENT



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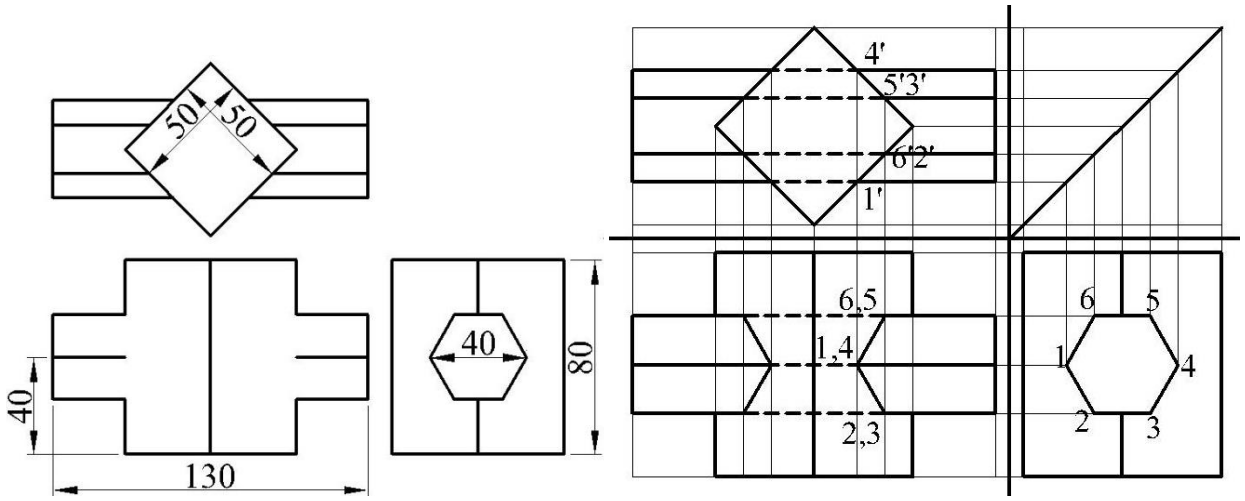
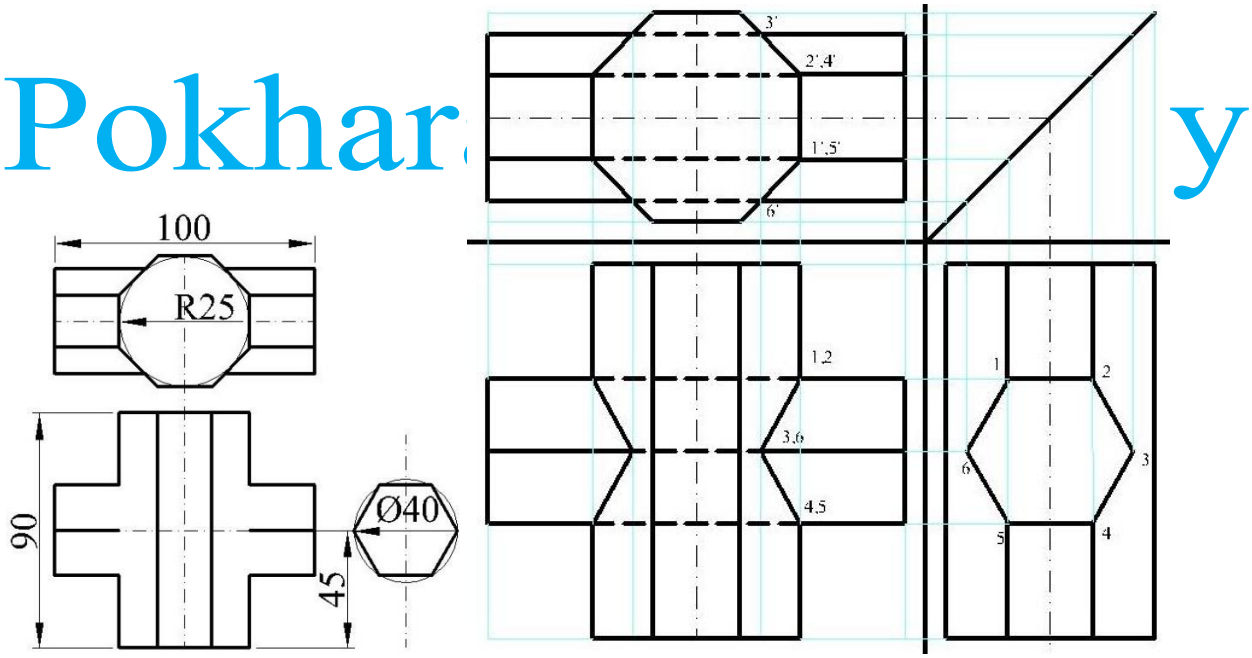
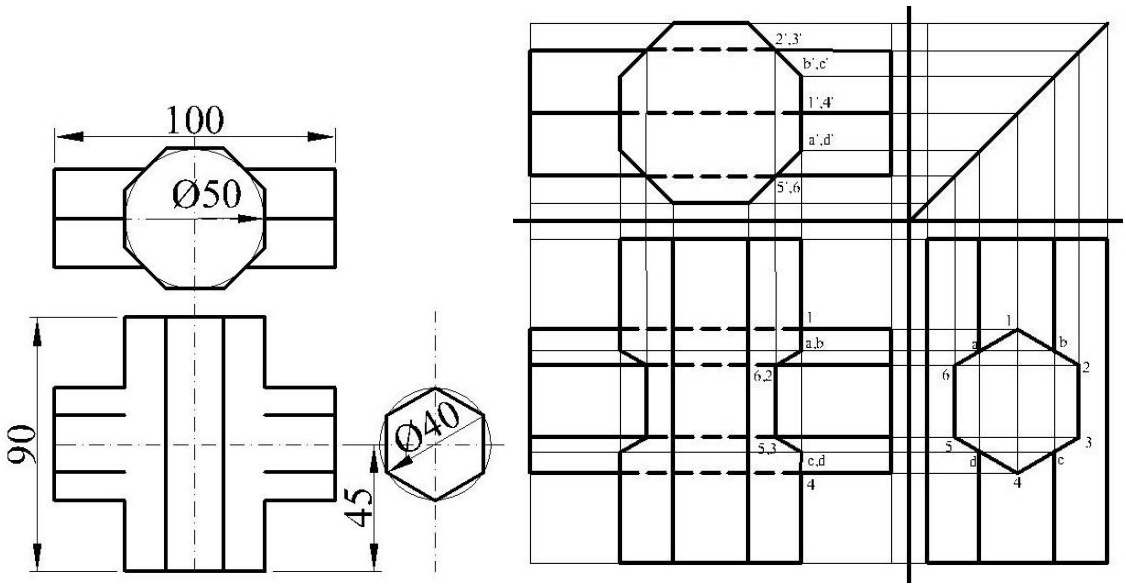
Reproduced the given views of objects and draw the curves /lines of intersection.







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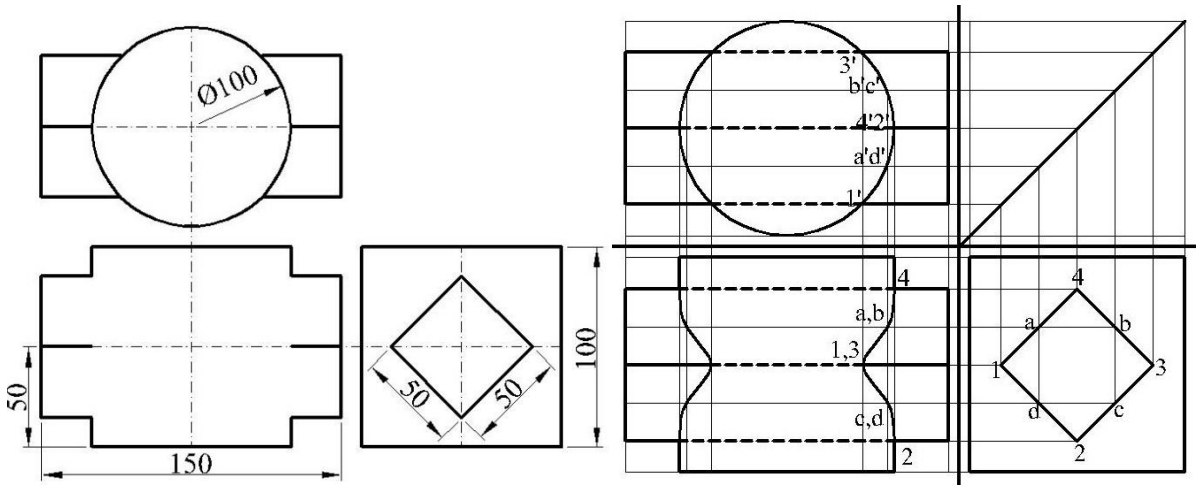
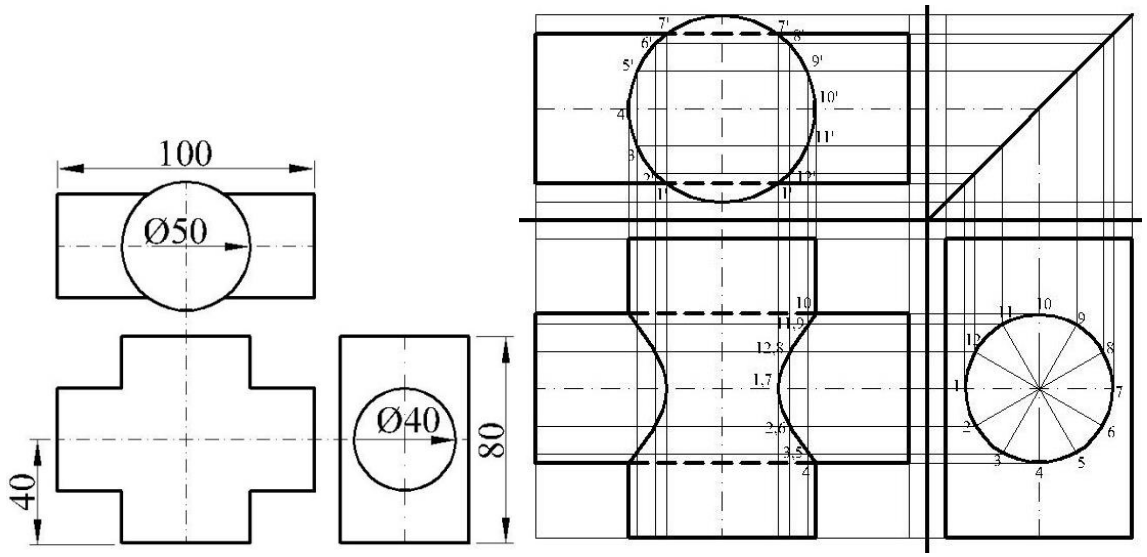
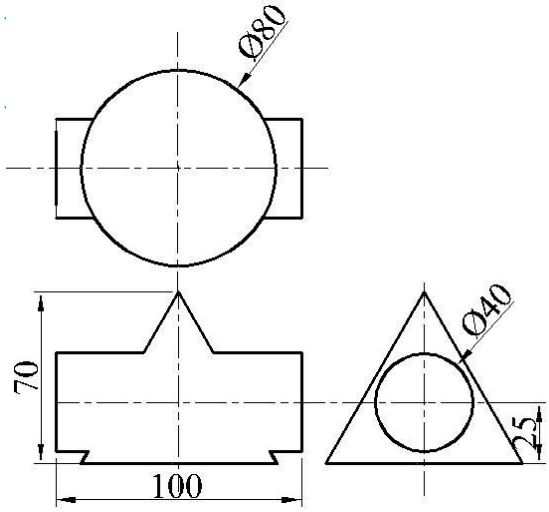
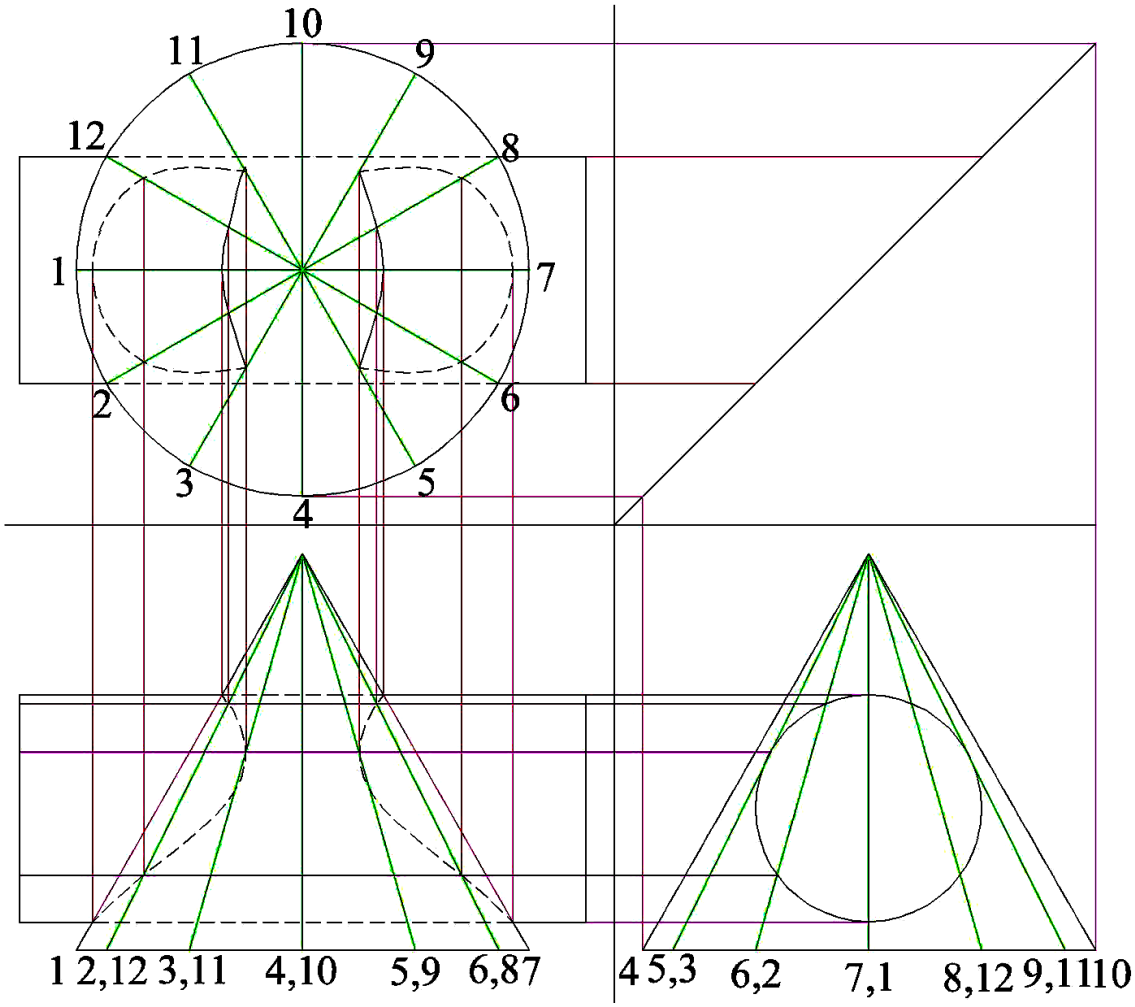


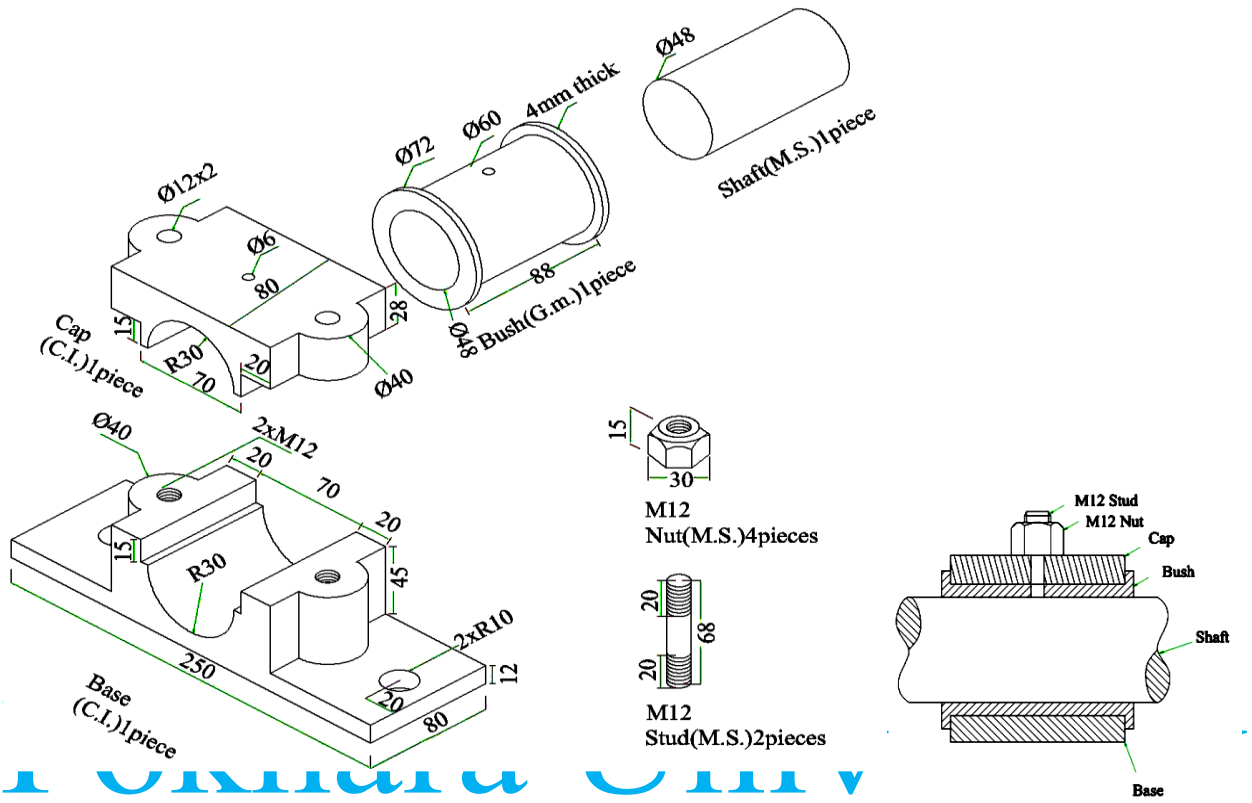


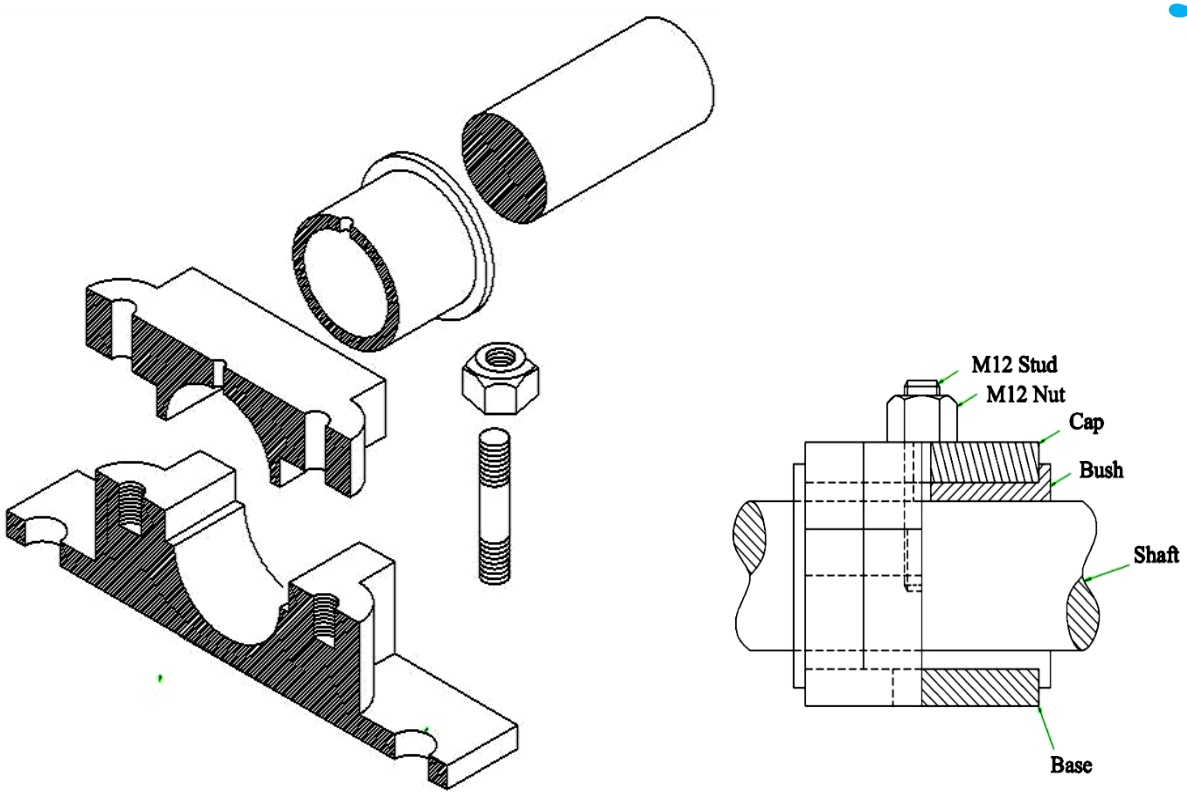


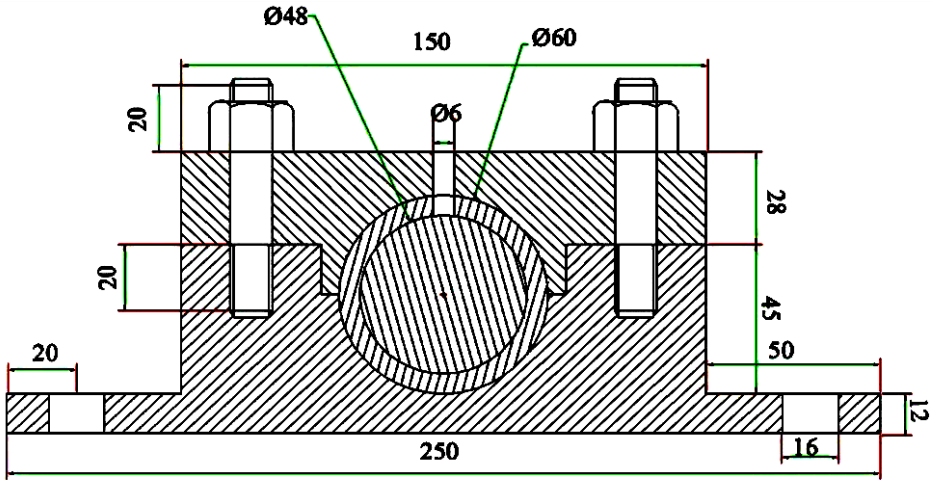
University


10
11
9
12
8
1
7
2
6
3
5
4
1 2,12 3,11 4,10 5,9 6,87
4 5,3 6,2 7,1 8,12 9,1110

Assembled the given parts of Split Bearing and draw fullsectional / half sectional front view.







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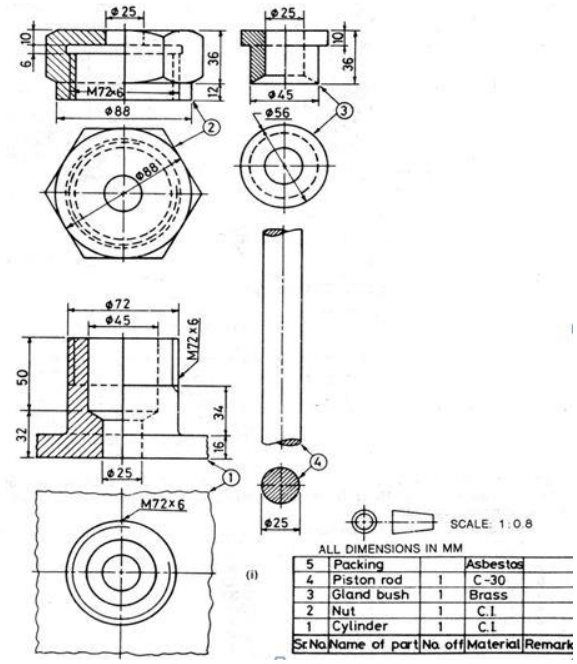
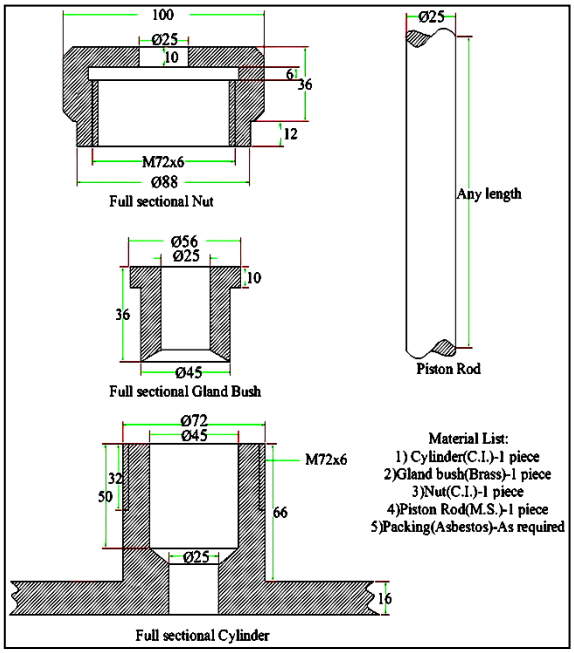
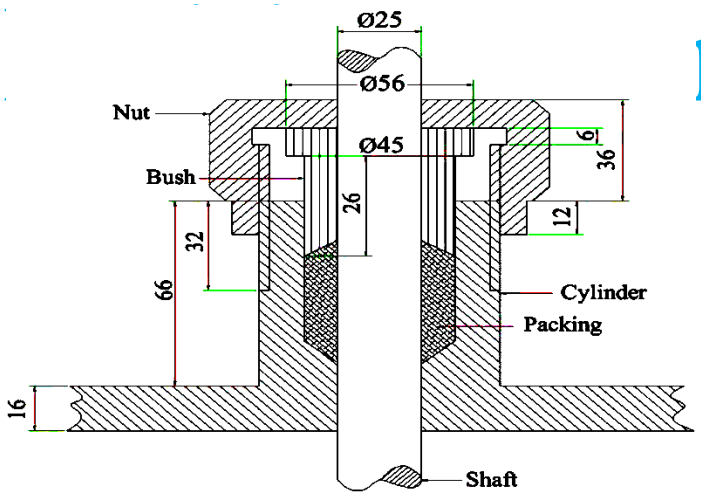
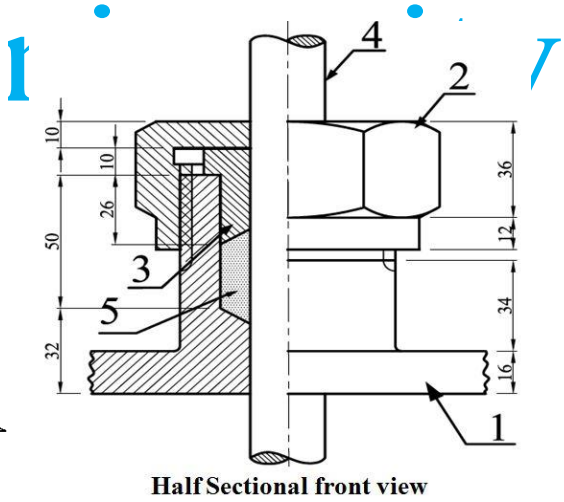
Assembled the given parts of Stuffing Box and draw its fullsectional / half sectional front view.

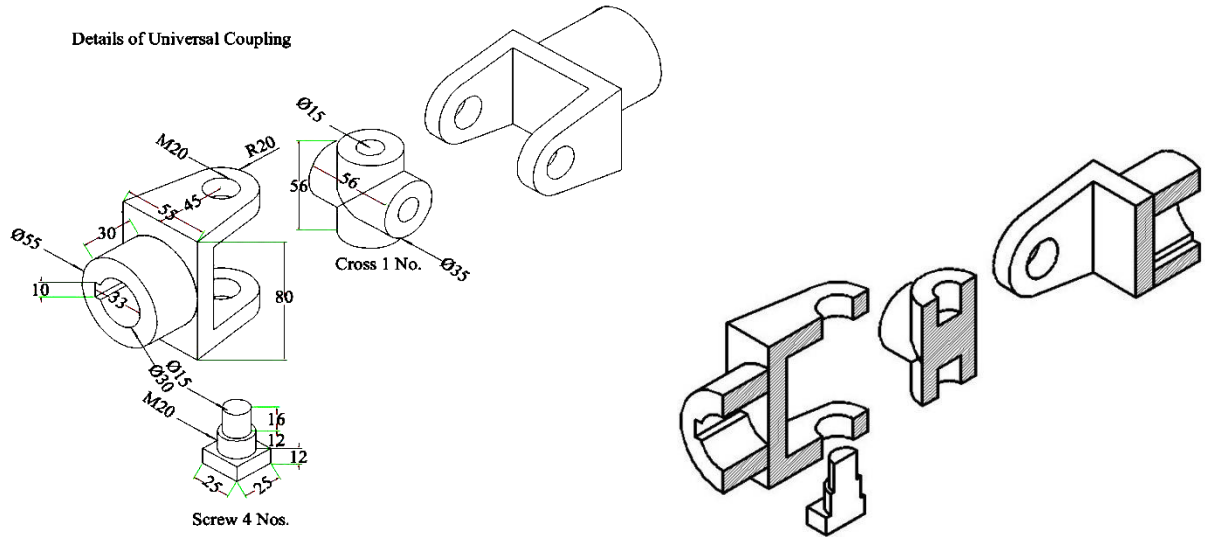


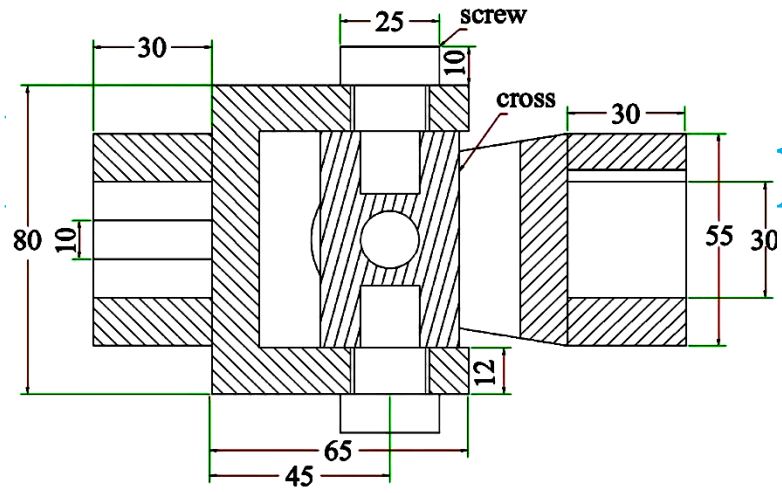


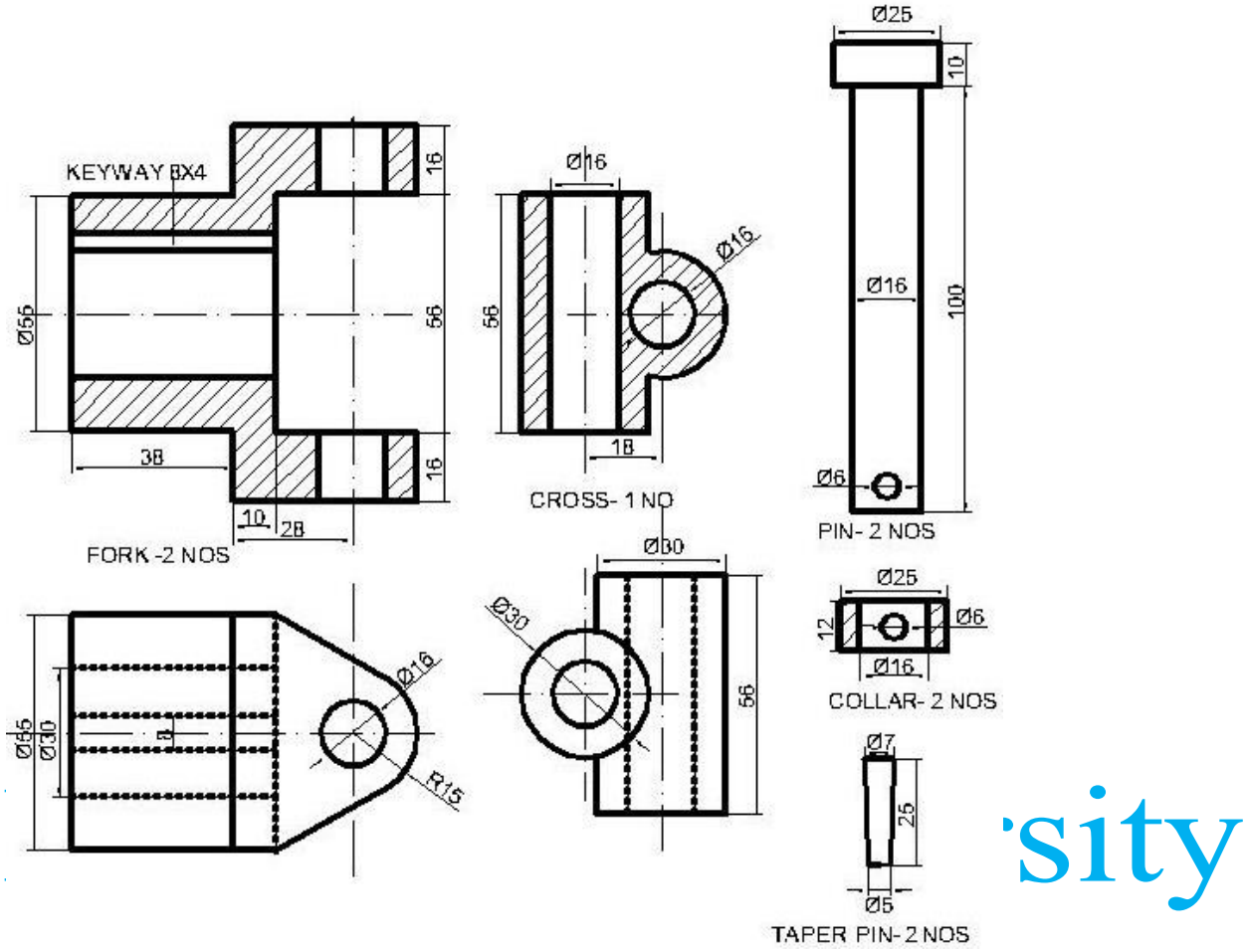




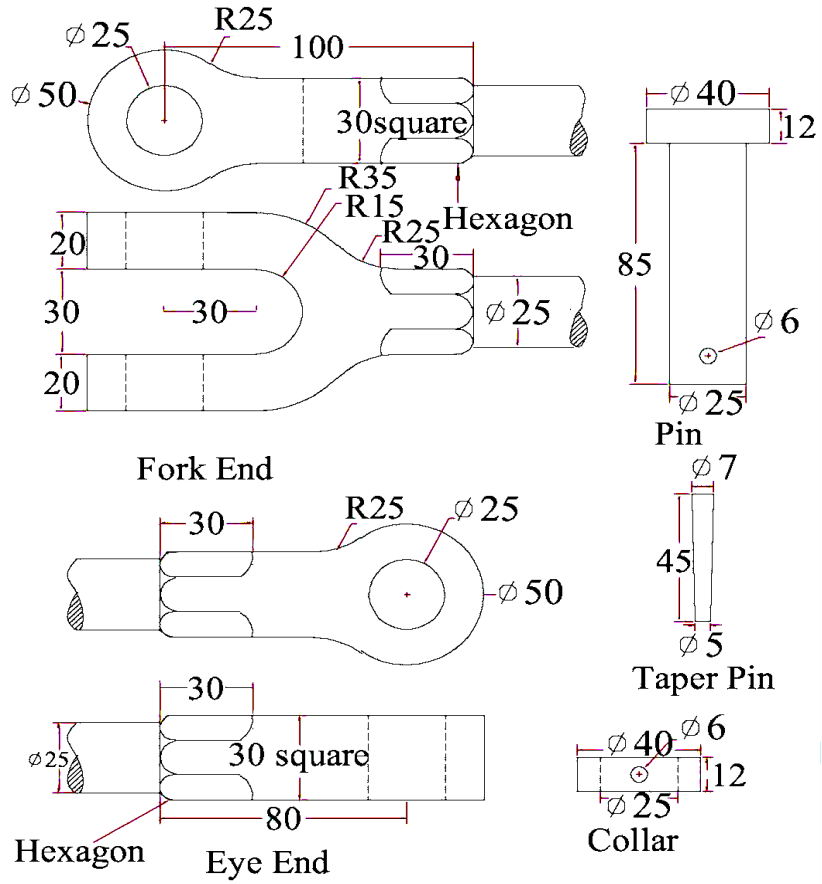
Assembled the given parts of Universal Coupling and draw fullsectional / half sectional front view.

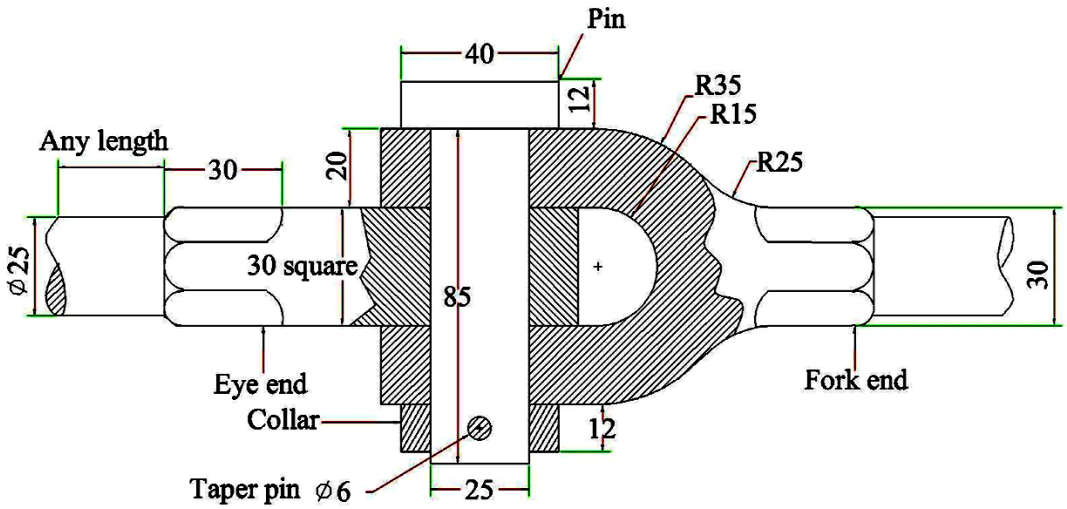




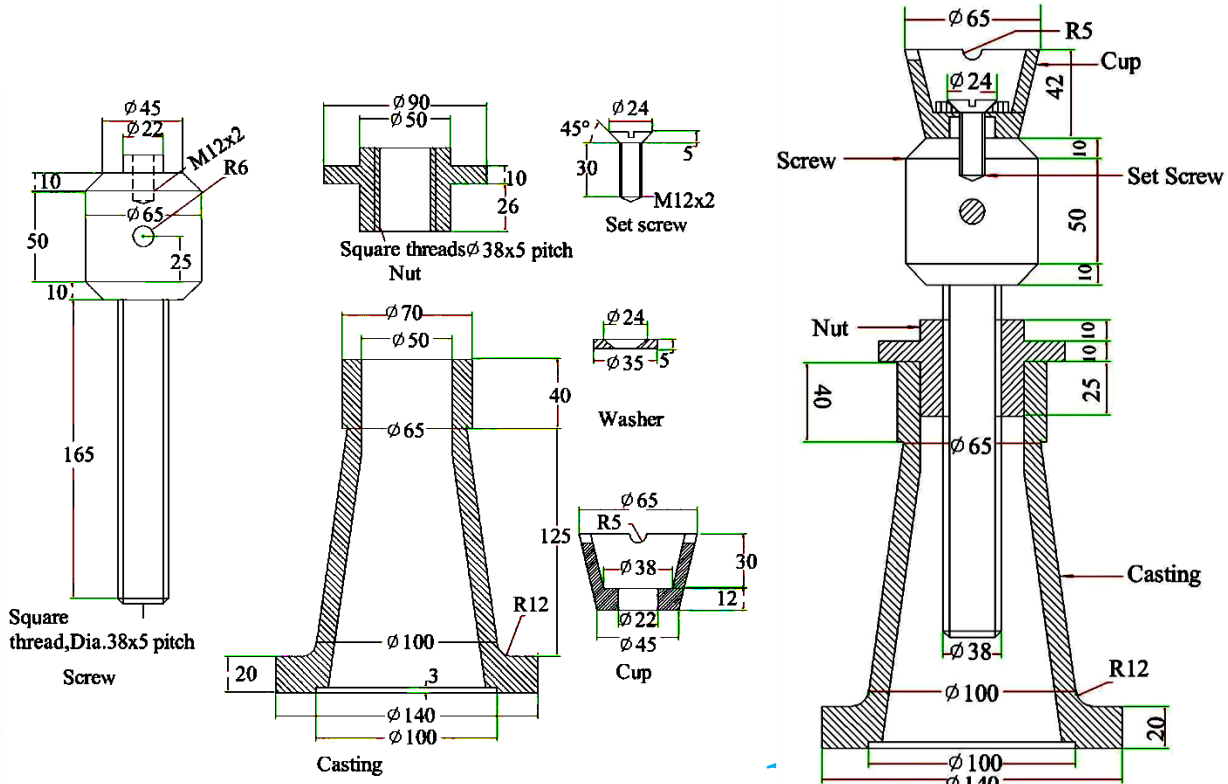

KEYWAY 8X4
16
Ø56
56
38
16
10
28
FORK -2 NOS
Ø16
Ø16
56
18
CROSS- 1 NO
Ø25
10
Ø16
100
Ø6
PIN- 2 NOS
Ø56
Ø30
8
Ø16
R15
Ø30
Ø30
56
Ø25
12
Ø6
Ø16
COLLAR- 2 NOS
Ø7
25
Ø5
TAPER PIN- 2 NOS

Assembled the given parts of Knuckle Joints and draw fullsectional / half sectional front view.





Assembled the given parts of Screw Jack and draw fullsectional / half sectional front view



Assembled the given parts of Centering Cone and draw fullsectional / half sectional front view.