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CAEG(21ME16/26)
Computer Aided Engineering Graphics
(Solutions)

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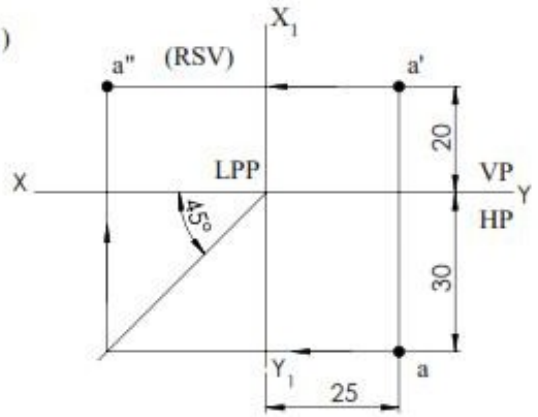
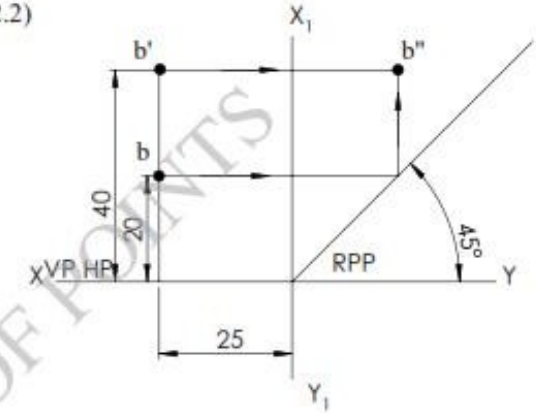
Projections of Points

Projections of Points

2.1)



2.2)



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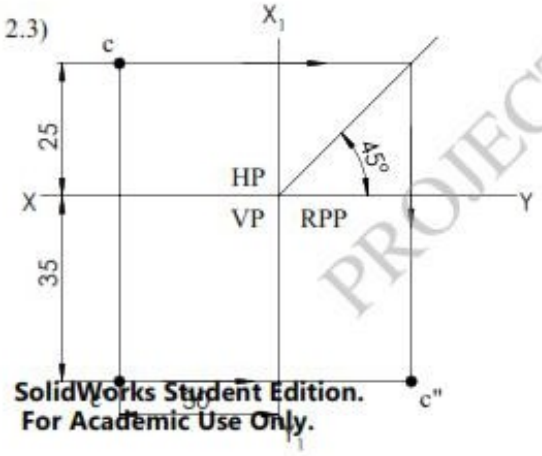

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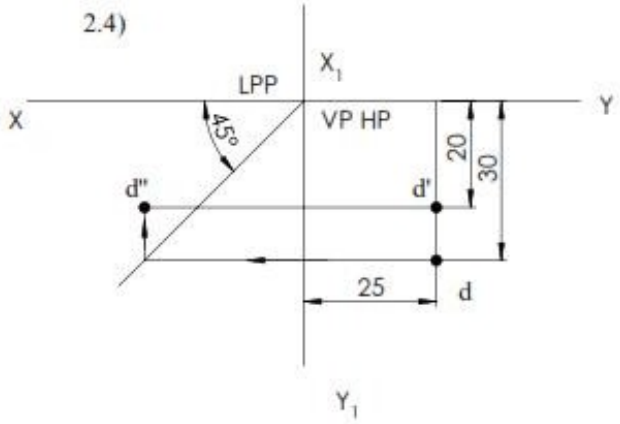
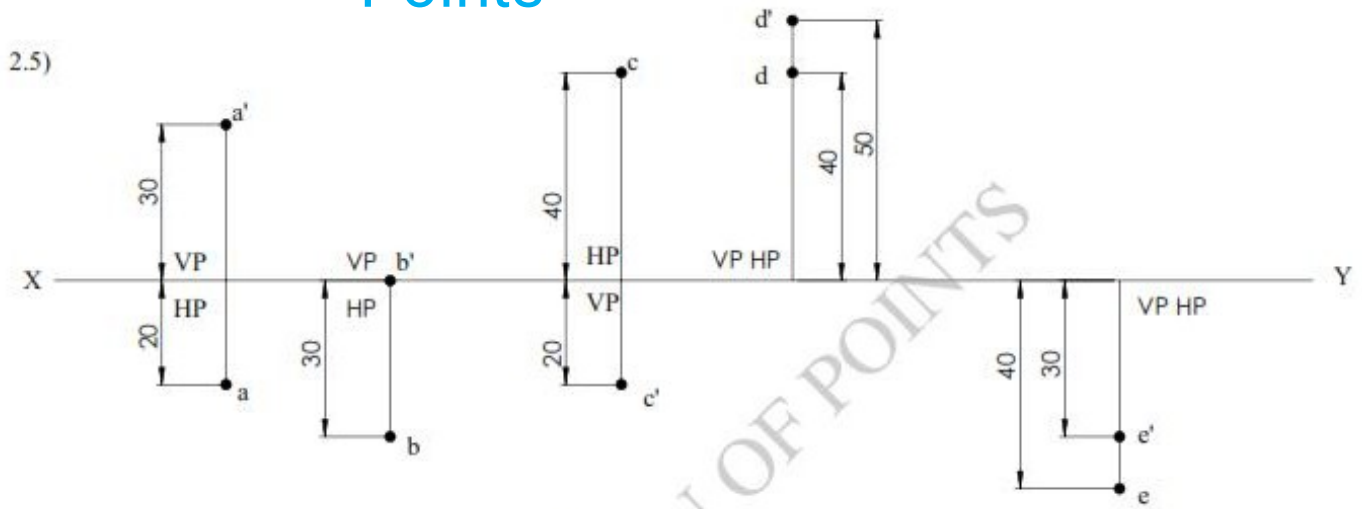
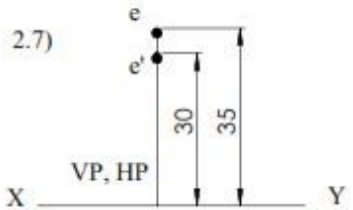


Projections of Points

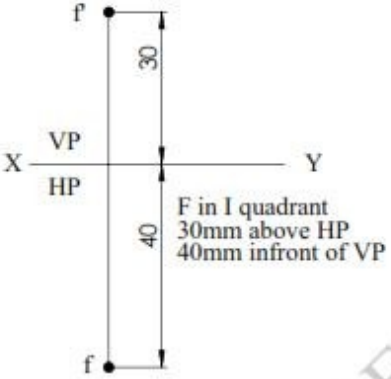


Projections of Points

2.7)

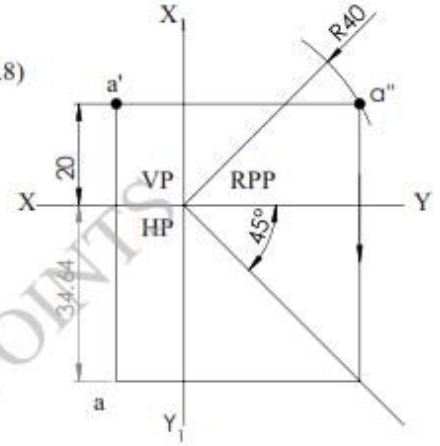


E in II quadrant
30mm above HP
35mm behind VP



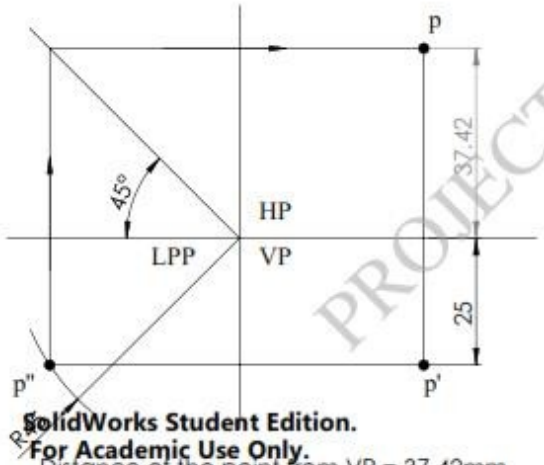
F in I quadrant
30mm above HP
40mm infront of VP

2.8)



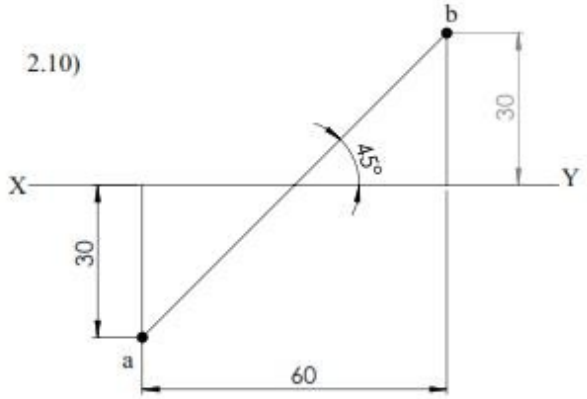
Distance of the point from VP = 34.64mm

2.9)



Distance of the point from VP = 37.42mm

2.10)



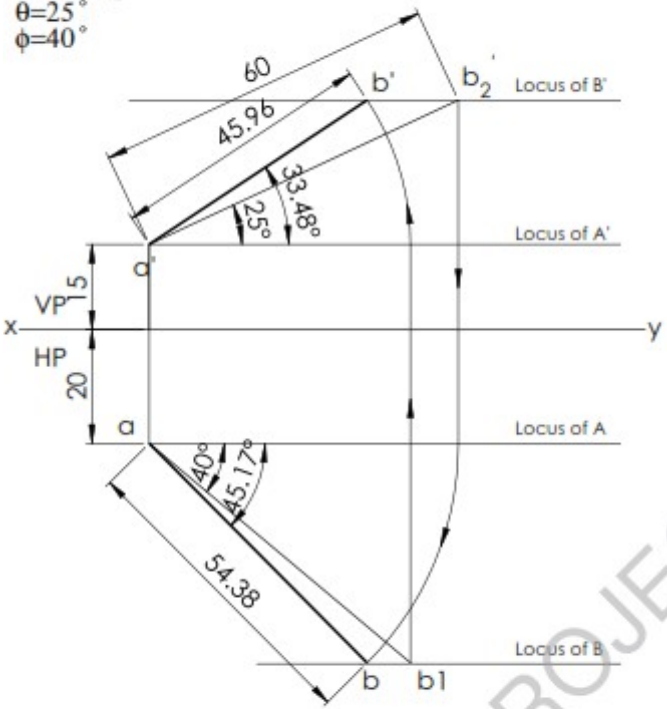
Distance of the point B from VP = 30mm

Projections of Straight Lines

Projections of Straight Lines

Problem 3.6

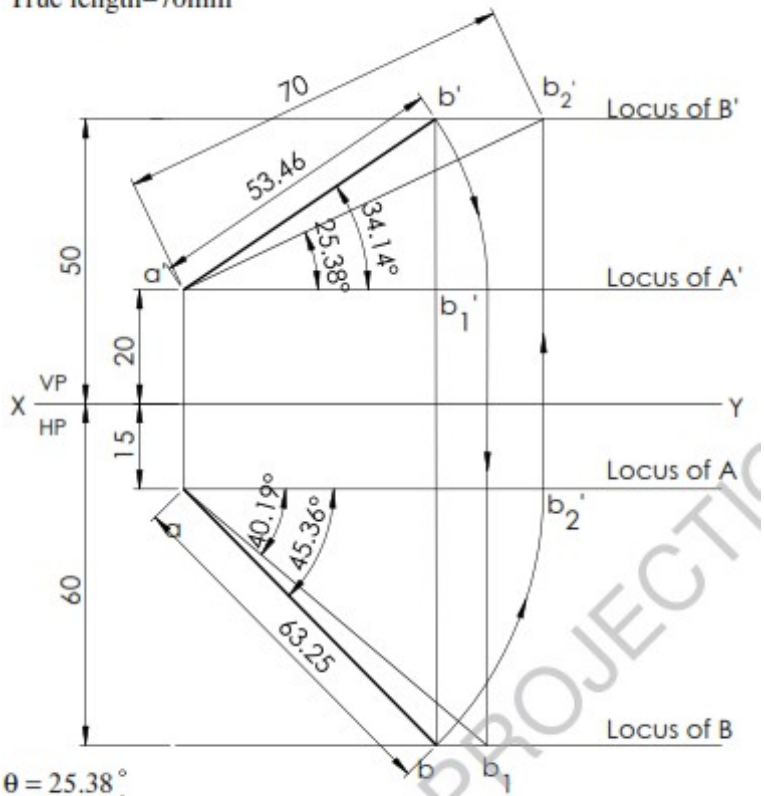
Given data:
True length=60mm
θ=25°
ϕ=40°



α = 33.48°
β = 45.17°
ab= 54.38mm
a'b'= 45.96mm

Problem 3.7

Given data:
True length=70mm



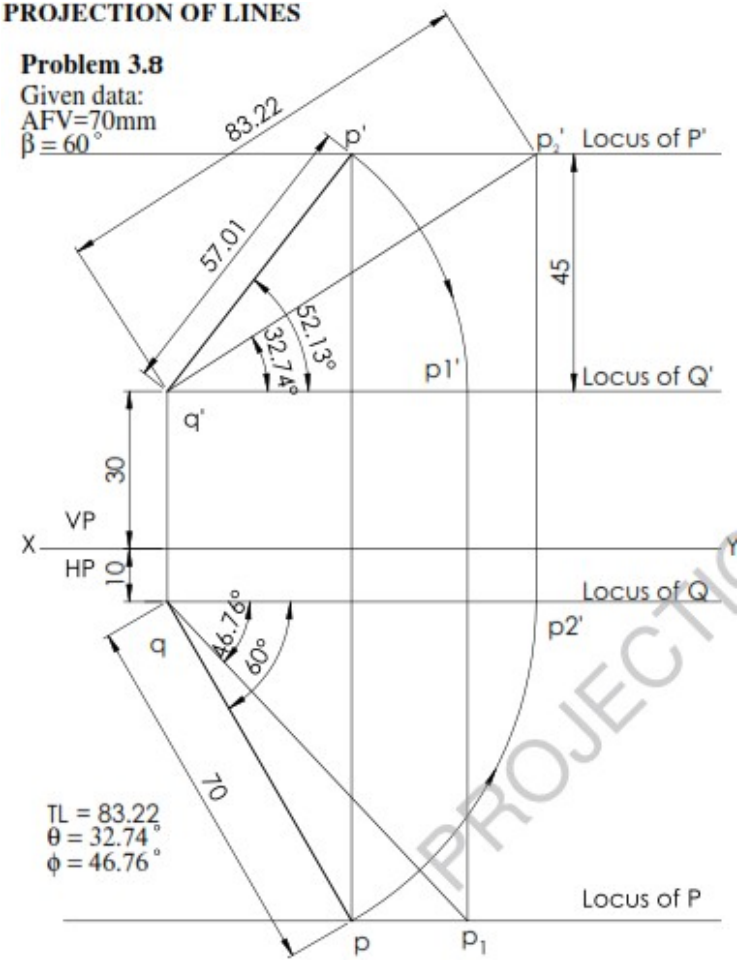
θ = 25.38°
ϕ = 40.19°
α = 34.14°
β = 45.36°

Projections of Straight Lines.

PROJECTION OF LINES

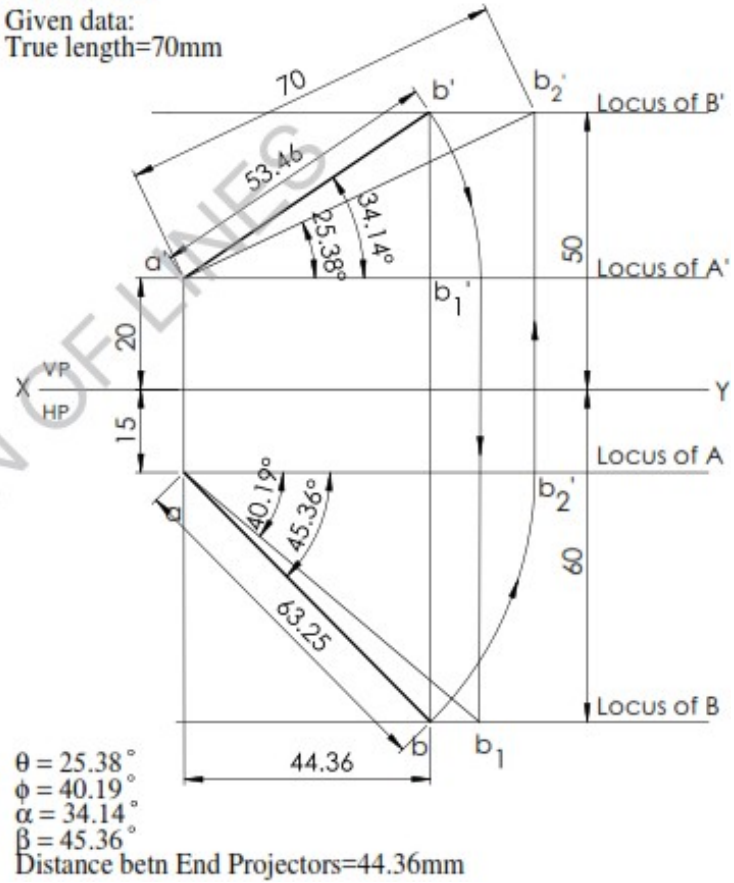
Problem 3.8

Given data:
AFV=70mm
$\beta = 60^\circ$



Problem 3.9

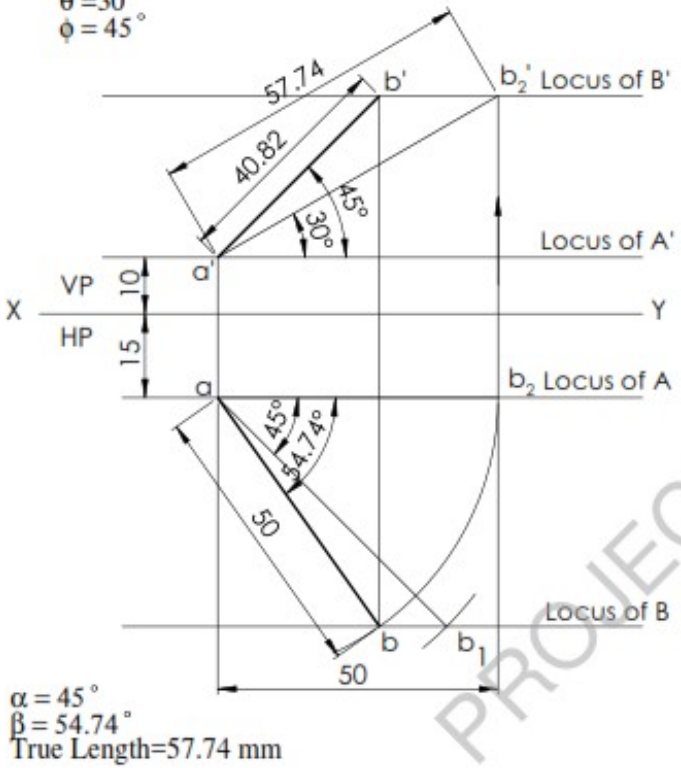
Given data:
True length=70mm



Projections of Straight Lines.

Problem 3.10

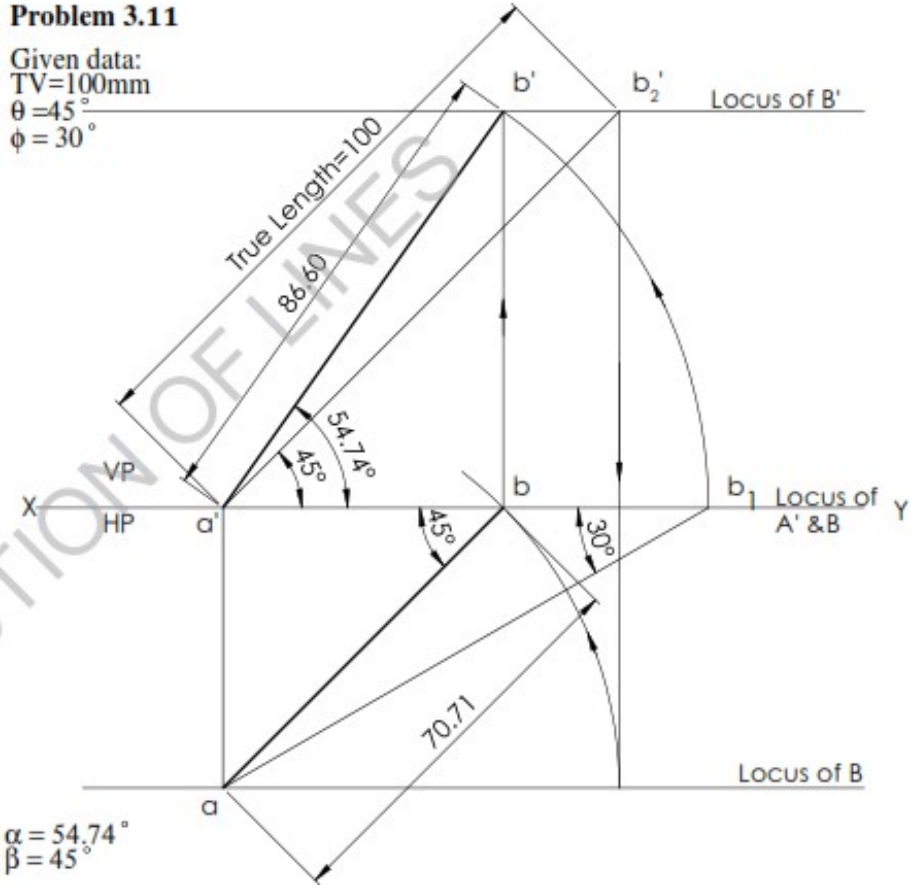
Given data:
ATV=50mm
θ =30°
ϕ = 45°



α = 45°
β = 54.74°
True Length=57.74 mm

Problem 3.11

Given data:
TV=100mm
θ =45°
ϕ = 30°

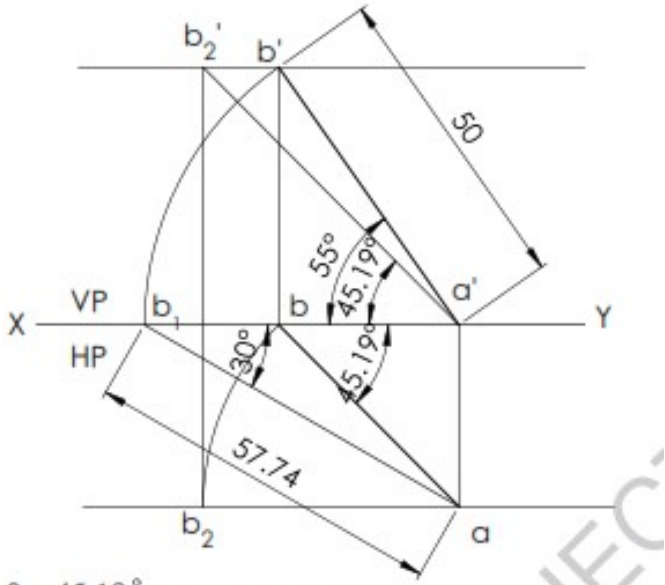


α = 54.74°
β = 45°

Projections of Straight Lines.

Problem 3.12

Given data:
AFV=50mm
$\alpha = 55^\circ$
$\phi = 30^\circ$

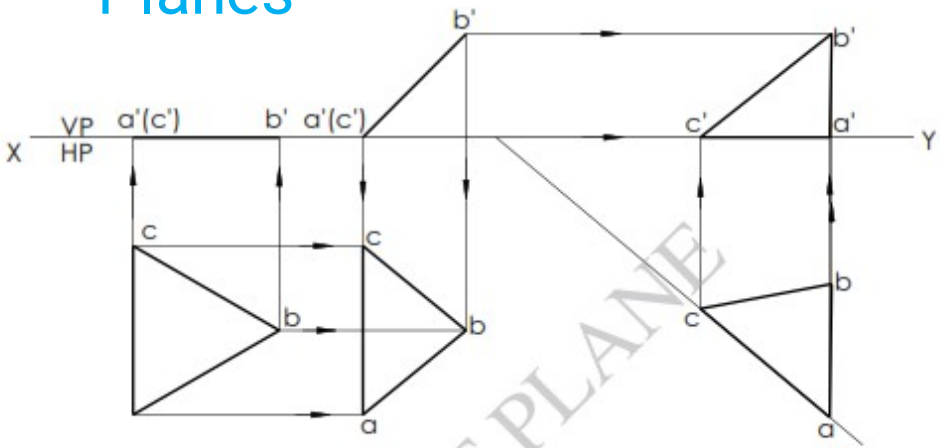


$\theta = 45.19^\circ$
True Length = 57.74mm

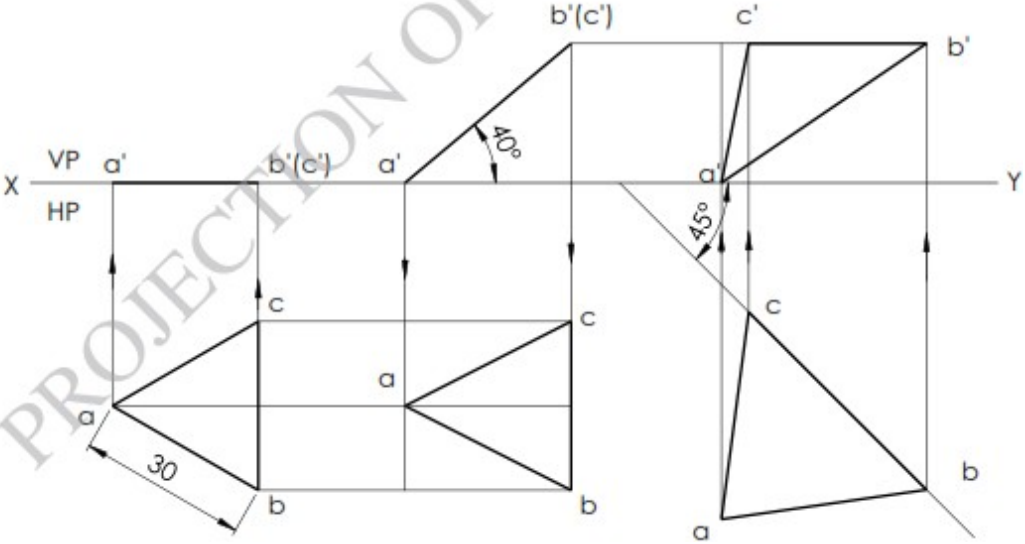
Projections of Planes

Projections of Planes

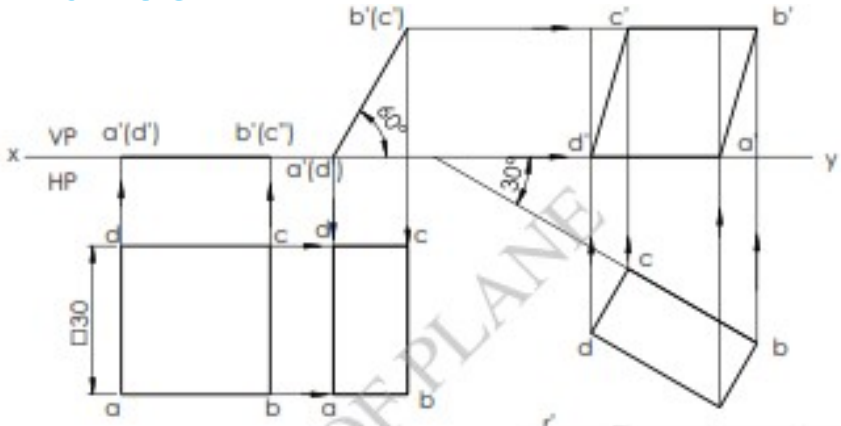
Problem 4.1 An equilateral triangular lamina of 30 mm sides resting on one of its sides on HP. The lamina makes 45^0 with HP and the side on HP is inclined at 40^0 to VP. Draw the projections.



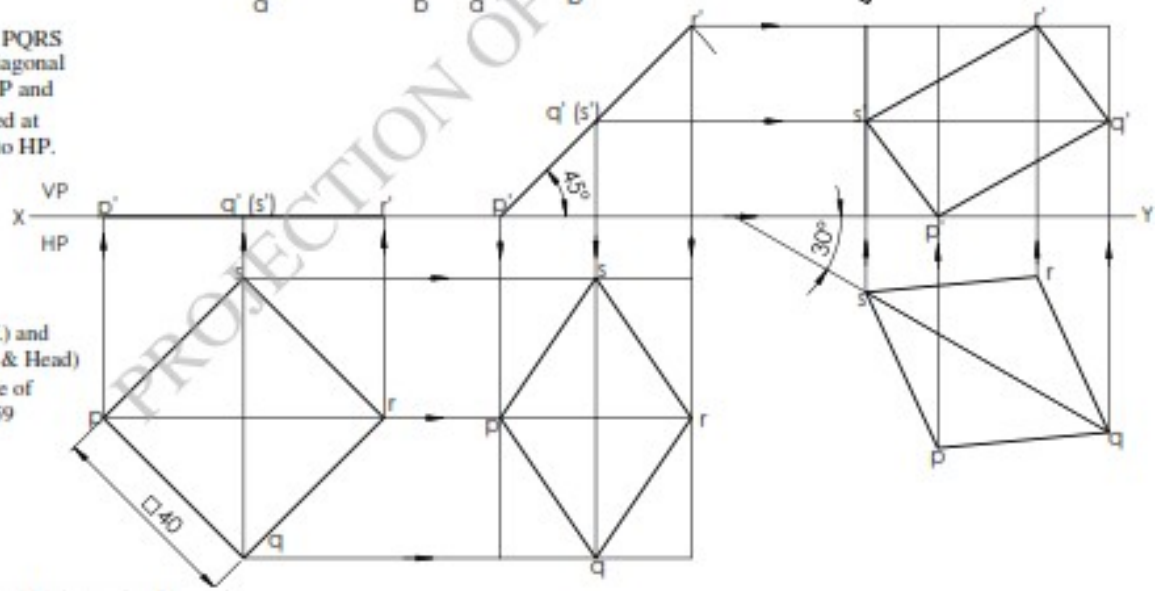
Problem 4.2 An equilateral triangular lamina of 30 mm sides resting on one of its corners on HP. The lamina makes 40^0 with HP and the side opposite to the corner on which it rests is inclined at 30^0 to VP. Draw the projections.



Problem 4.3 A square lamina of 30mm side rests on one of its sides on HP. The lamina makes 60° to HP and the side on which it rests makes 30° to VP. Draw its projections.



Problem 4.4 A square PQRS of 40mm side has its diagonal PR inclined at 45° to HP and the diagonal QS inclined at 30° to VP and parallel to HP. Draw its projections.



Prepared By:
Gangadhar Angadi (Asst. Prof.) and
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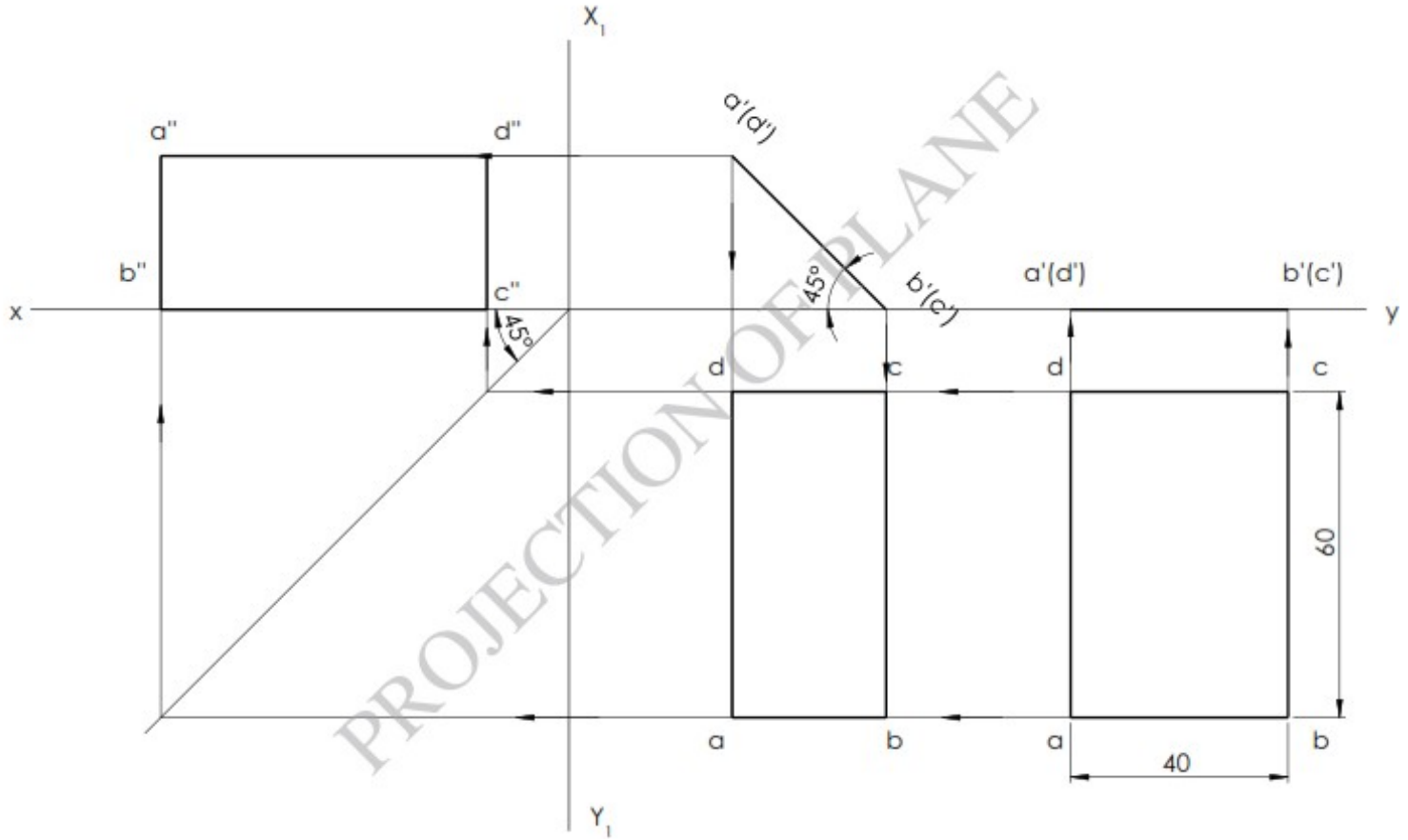
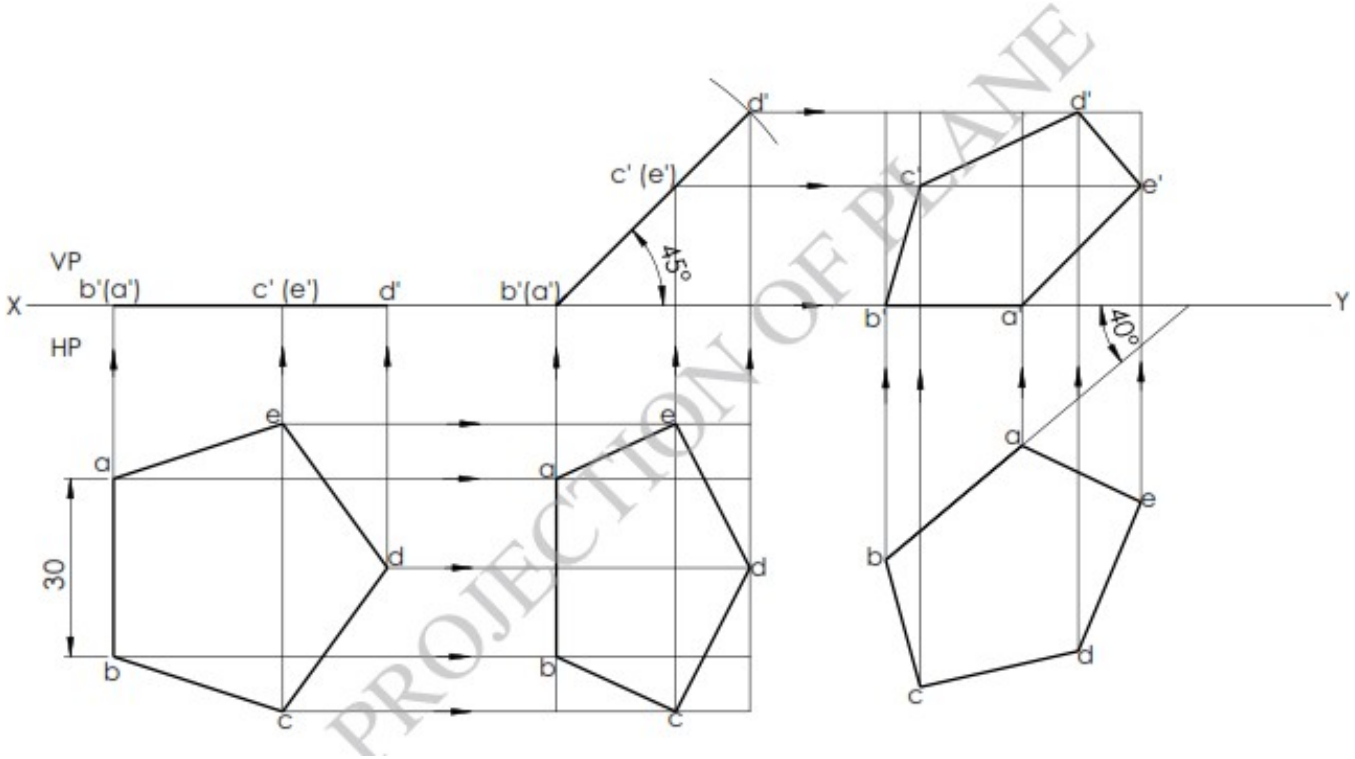
Mechanical Dept., R V College of Engineering, Bengaluru-560059

Problem 4.5 A rectangular lamina of sides 40mm X 60mm rests on HP on one of its longer edges. The lamina is tilted about the edge on which it rests till its plane surface is inclined to HP at 45°.The edge on which it rests is perpendicular to VP. Draw the projections of the lamina on VP, HP and LPP.

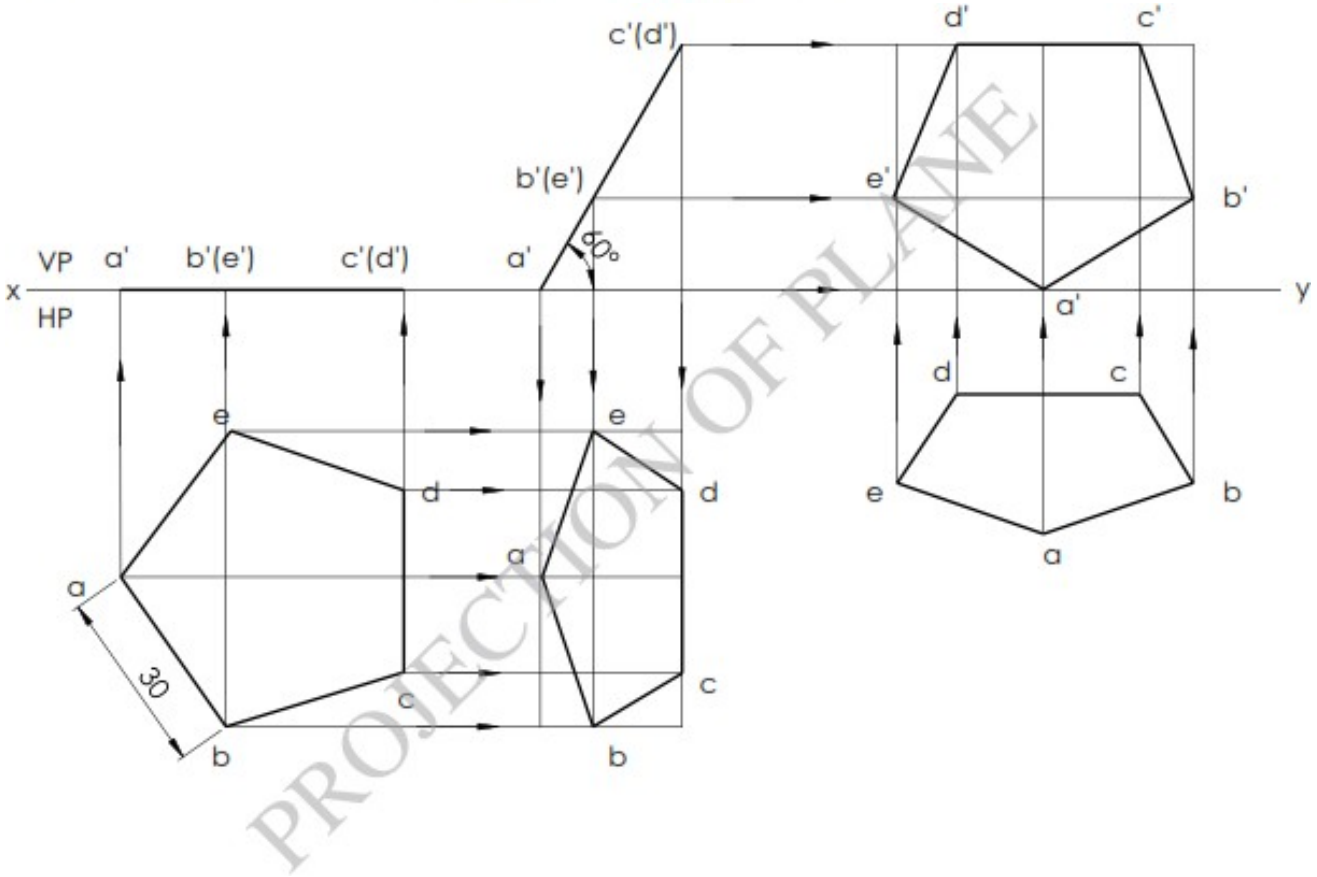


Problem 4.6 The pentagonal lamina of 30 mm sides resting on one of its sides on HP. The lamina makes 45^0 with HP and the side on HP is inclined at 40^0 to VP. Draw the projections.

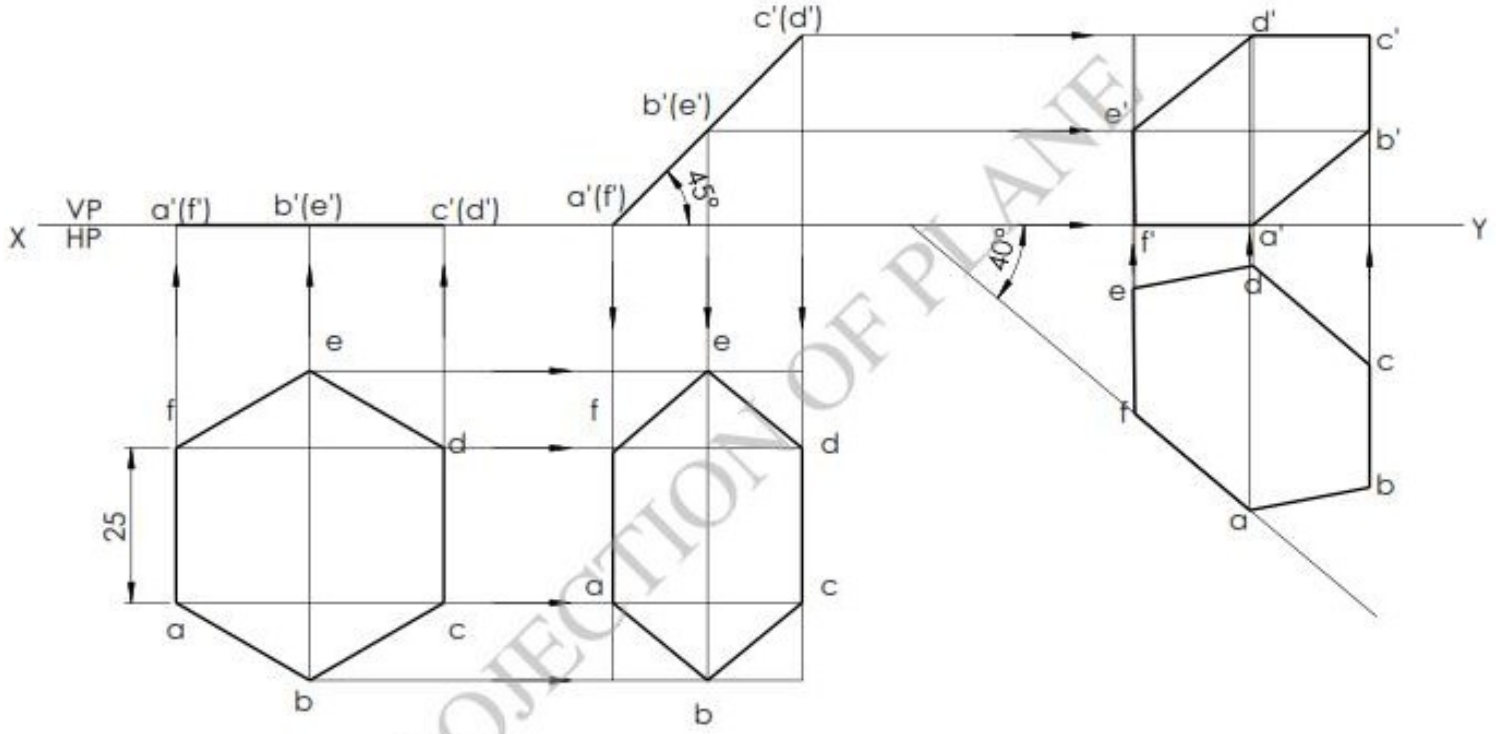
Problem 4.6



Problem 4.7 A pentagonal lamina of 30 mm sides rests on one of its corners on HP with the surface inclined at 60^0 to HP. The edge opposite to the corner on which it rests is parallel to VP. Draw the projections.

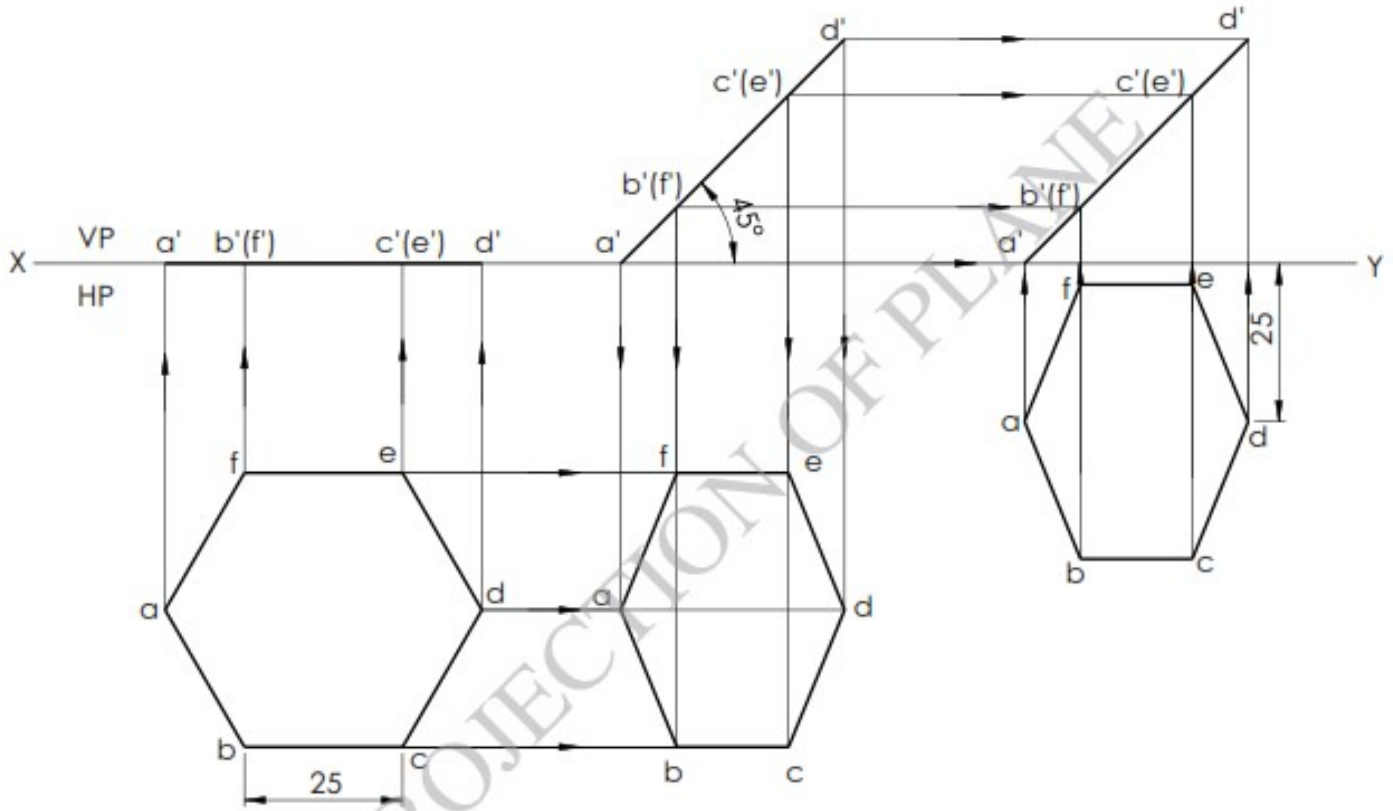


Problem 4.8 The hexagonal lamina of 25 mm sides resting on one of its sides on HP. The lamina makes 45^0 with HP and the side on HP is inclined at 40^0 to VP. Draw the projections.



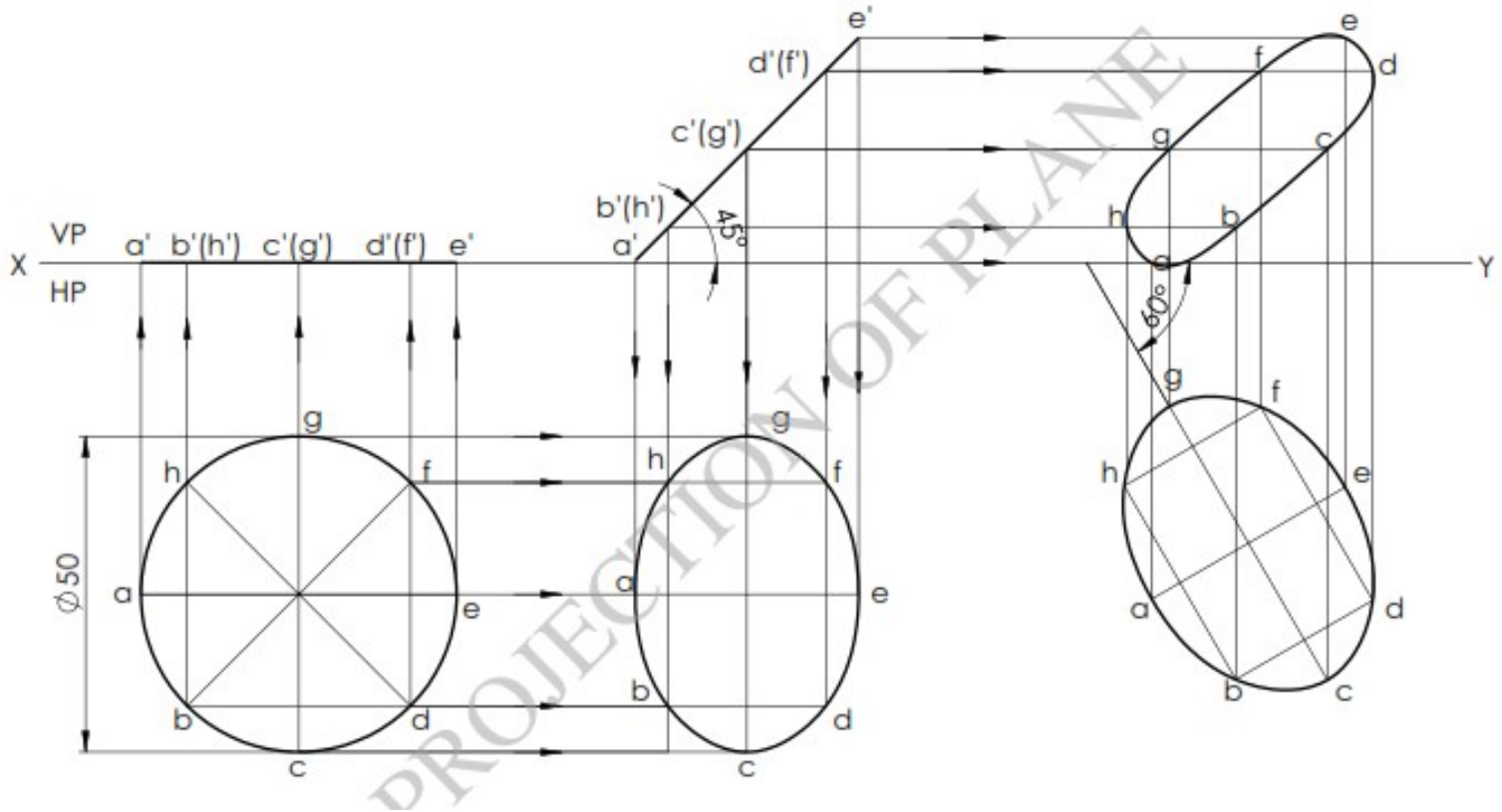
Projections of Planes

Problem 4.9 The hexagonal lamina of 25 mm sides resting on one of its corners on HP. The lamina makes 45^0 with HP and the corner opposite to corner on which it rests is 25 mm infront of VP and nearer to it. Draw the projections.



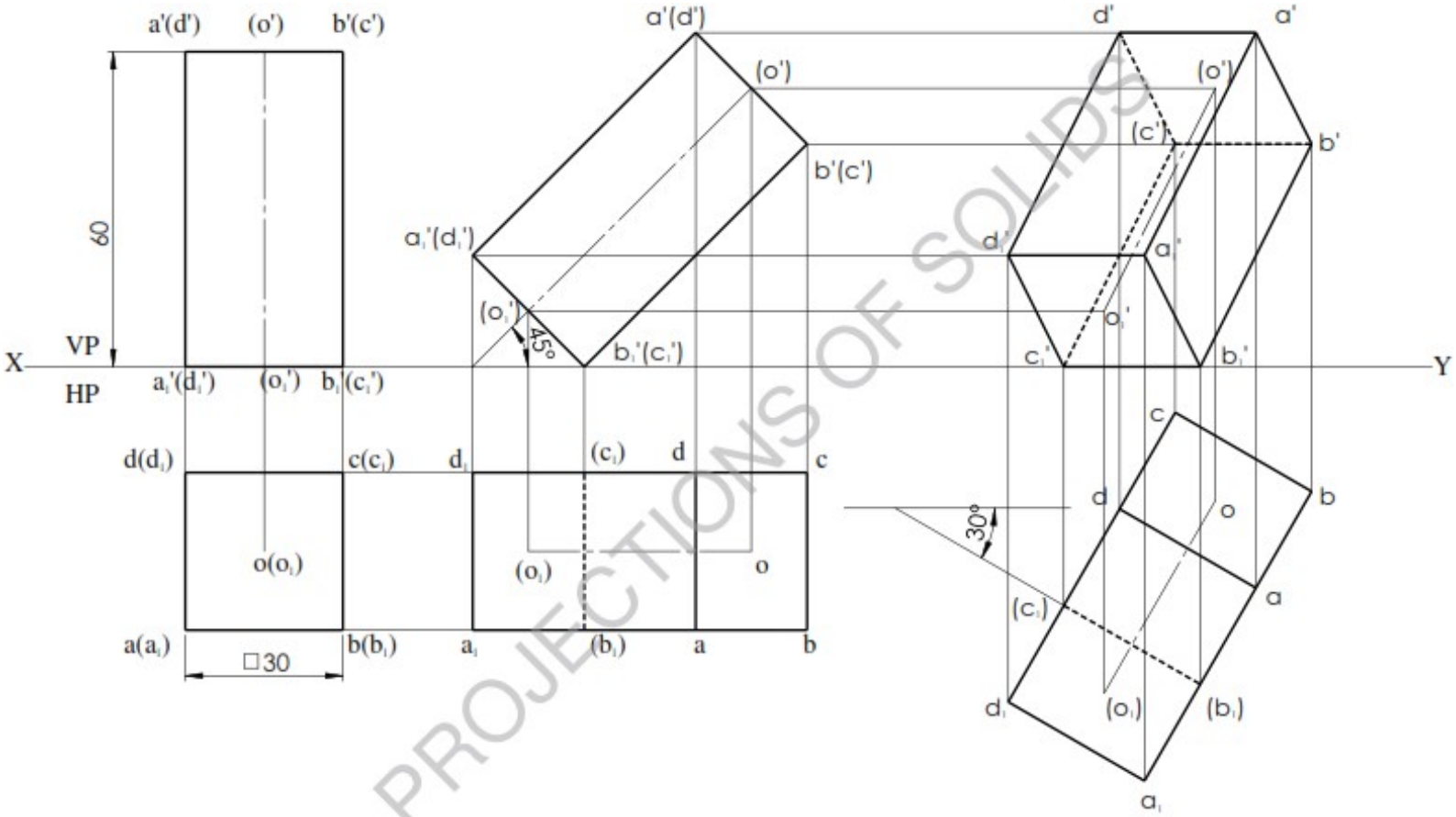
Projections of Planes

Problem 4.10 A circular lamina of 50 mm diameter rests on HP on a point A on the circumference, with its surface inclined at 45^0 to HP. The top view of the diameter passing through point A makes 60^0 to VP. Draw the projections.

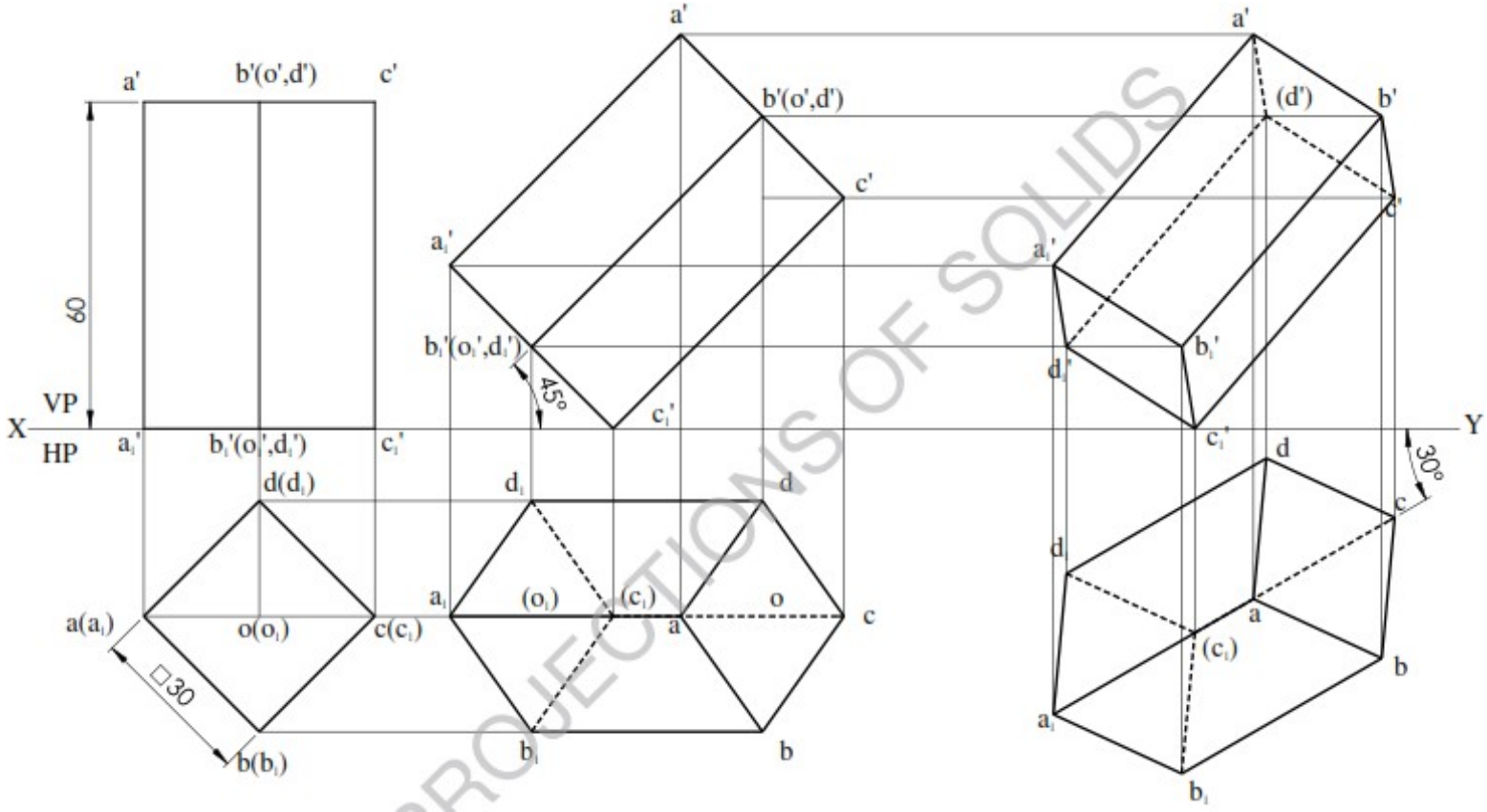


Projections of Solids

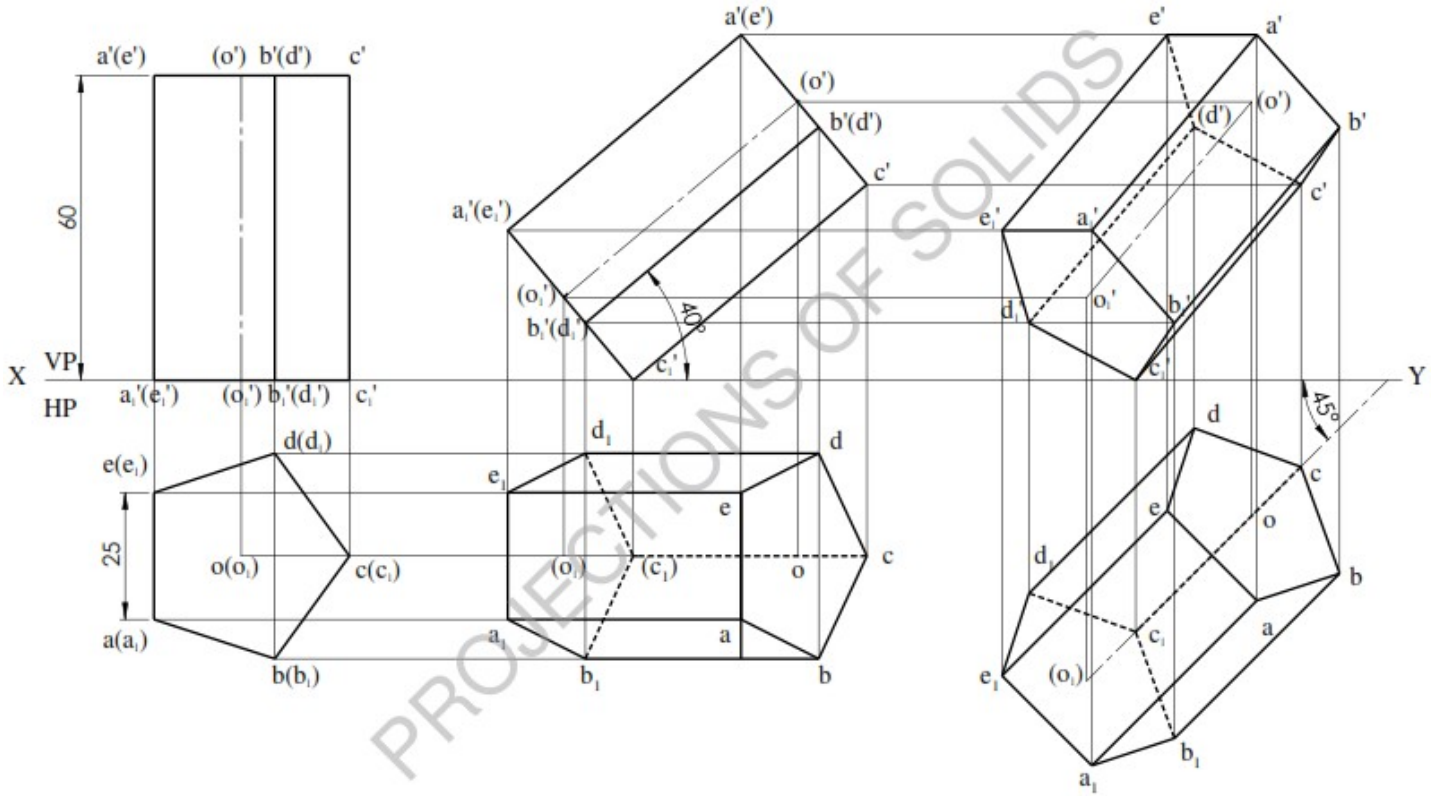
Problem 5.1: A square prism of base sides 30 mm and 60 mm axis length rests on HP on one of its base edges which is inclined at 30^0 to VP. Draw its projections when the axis is inclined at 45^0 to HP.



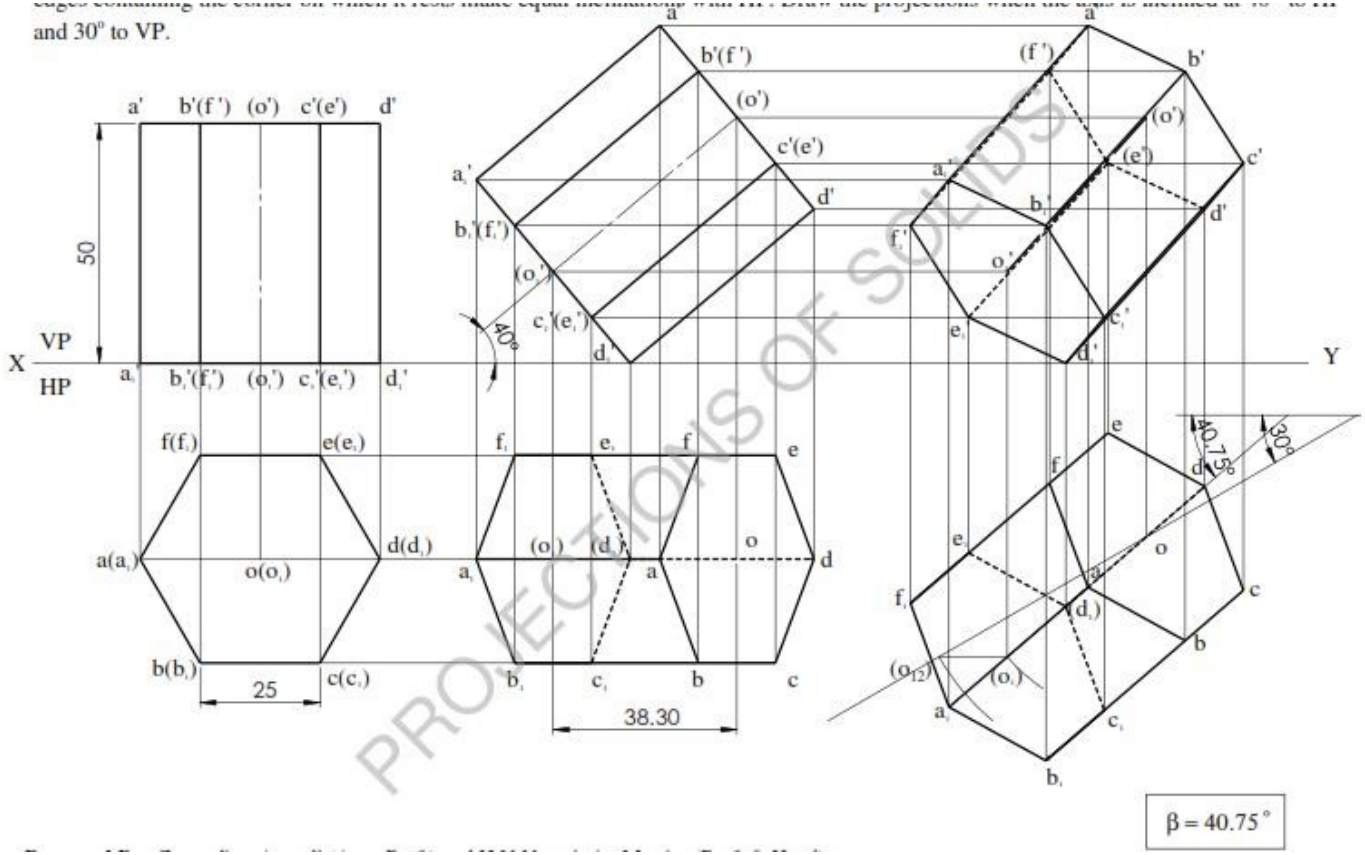
Problem 5.2: A square prism of base sides 30 mm and 60 mm axis length rests on HP on one of its base corners in such a way that the axis is inclined at 45^0 to HP. Draw its projections when the axis is inclined at 30^0 to VP.



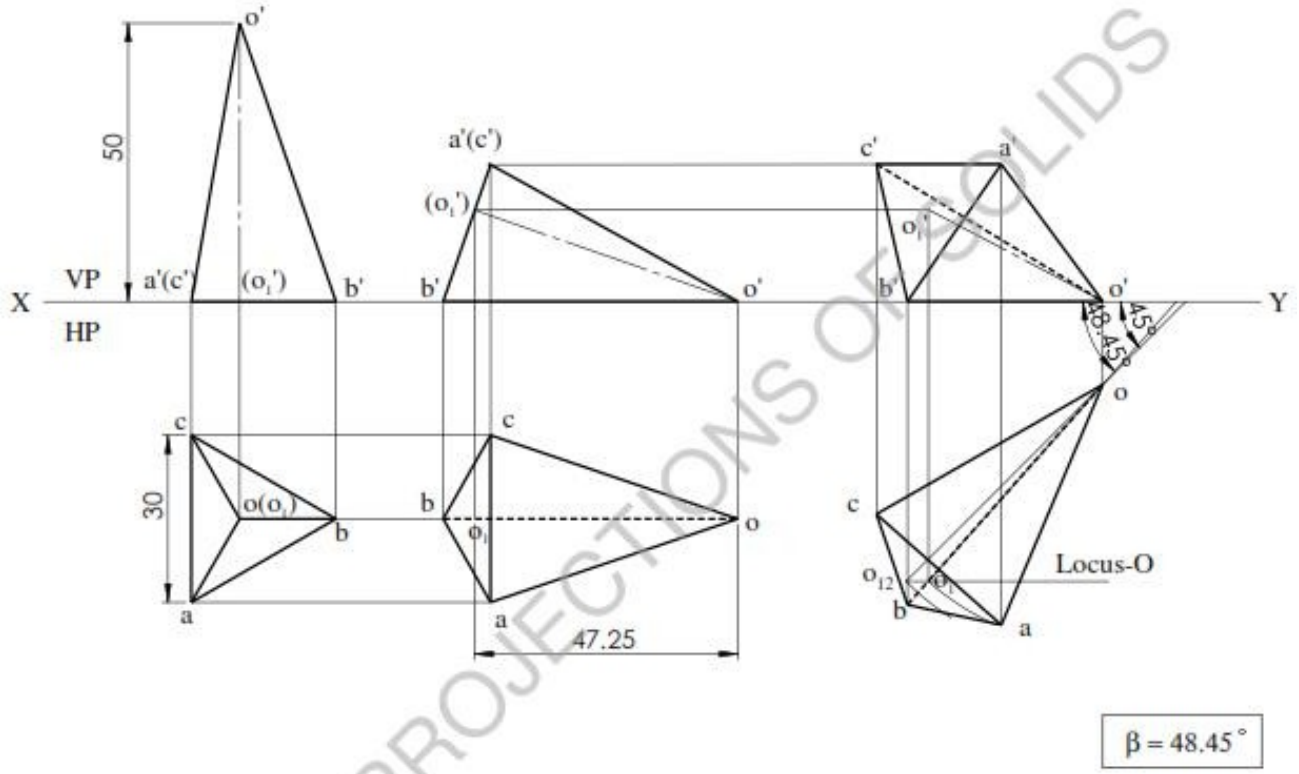
Problem 5.3: A pentagonal prism of base sides 25mm and 60mm axis length rests on HP on one of its base corners such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections when the axis is inclined at 40^0 to HP and appears to be inclined at 45^0 to XY line.



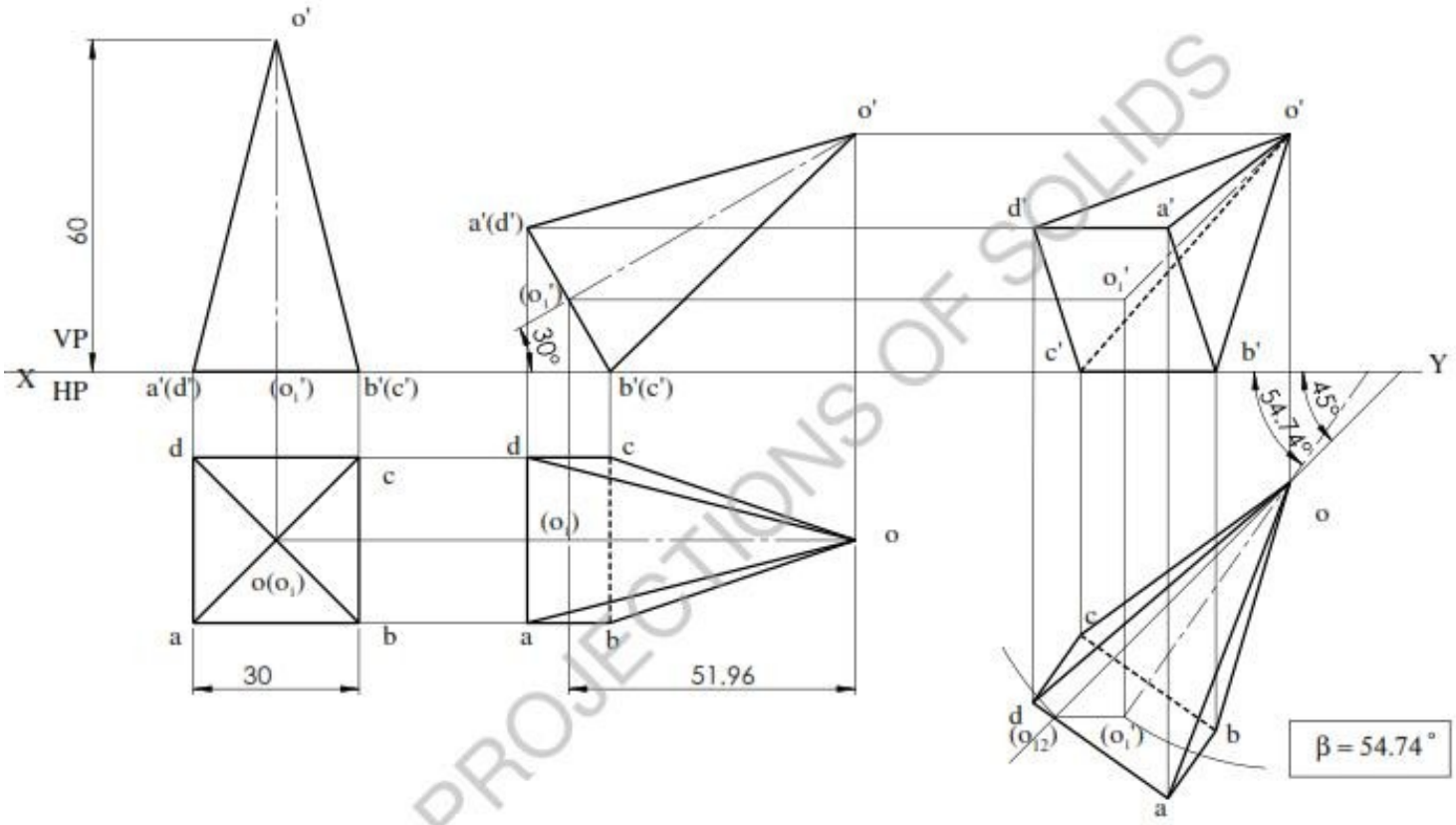
Problem 5.5: A hexagonal prism of base sides 25mm and 50mm axis length rests on HP on one of its base corners such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections when the axis is inclined at 40^0 to HP and 30^0 to VP.



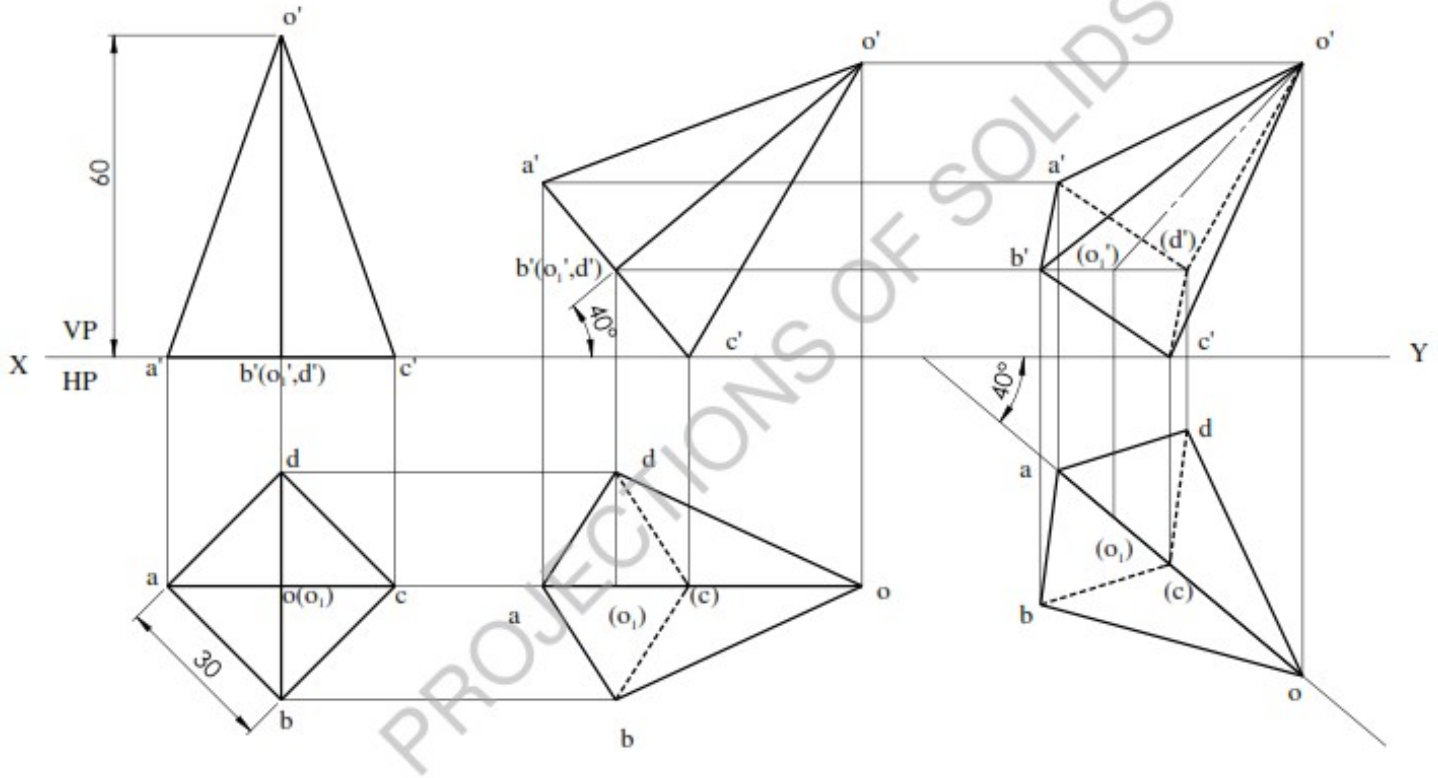
Problem 5.6: A triangular pyramid 30 mm base edges and 50 mm axis length rests on HP on one of its slant edges. Draw the projection of the pyramid when the axis is inclined to VP at 45^0.



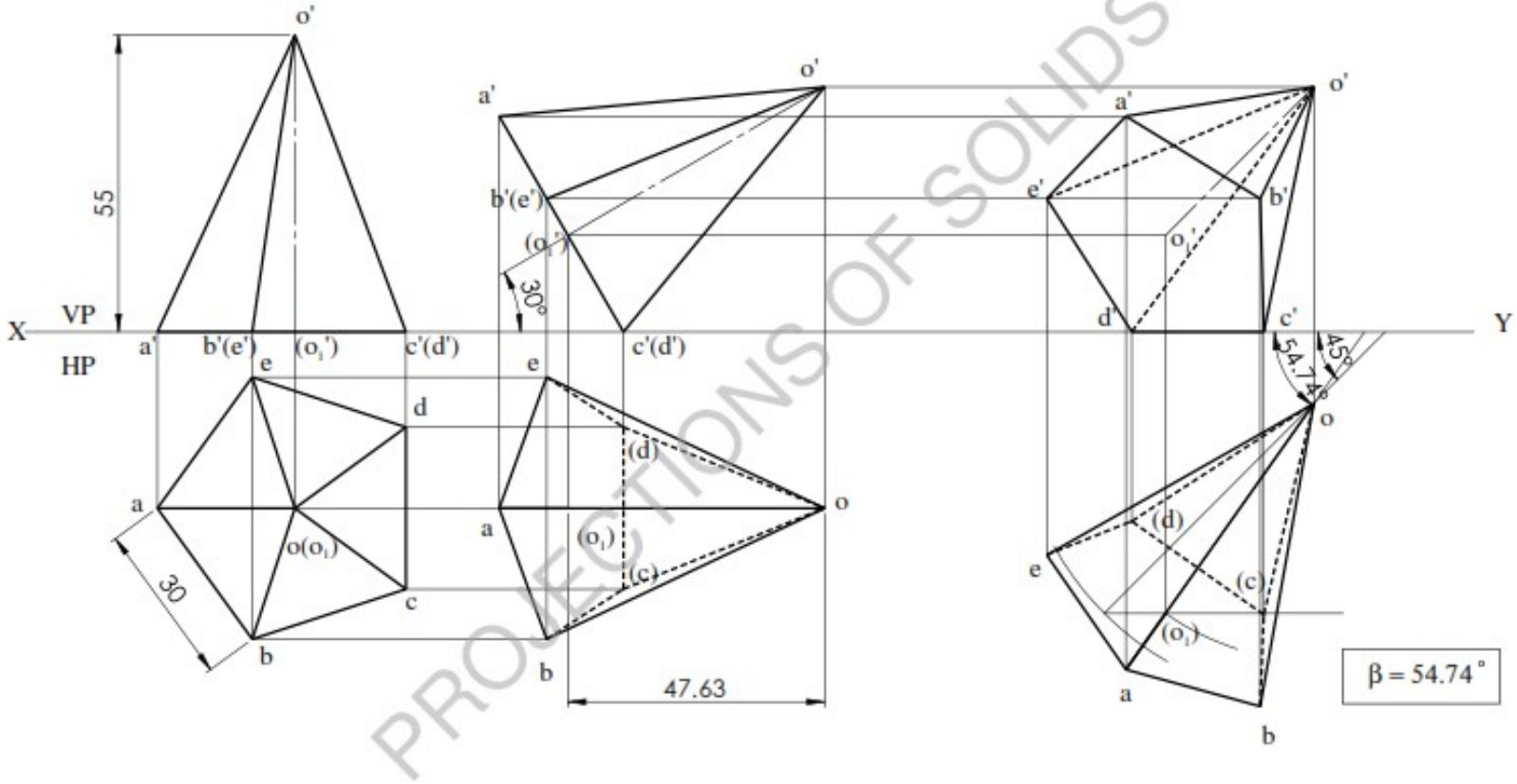
Problem 5.7: A square pyramid 30 mm base edge and 60 mm axis length rests on HP on one of its base edges. Draw the projection of the pyramid when the axis is inclined at 30^0 to HP and 45^0 to VP.



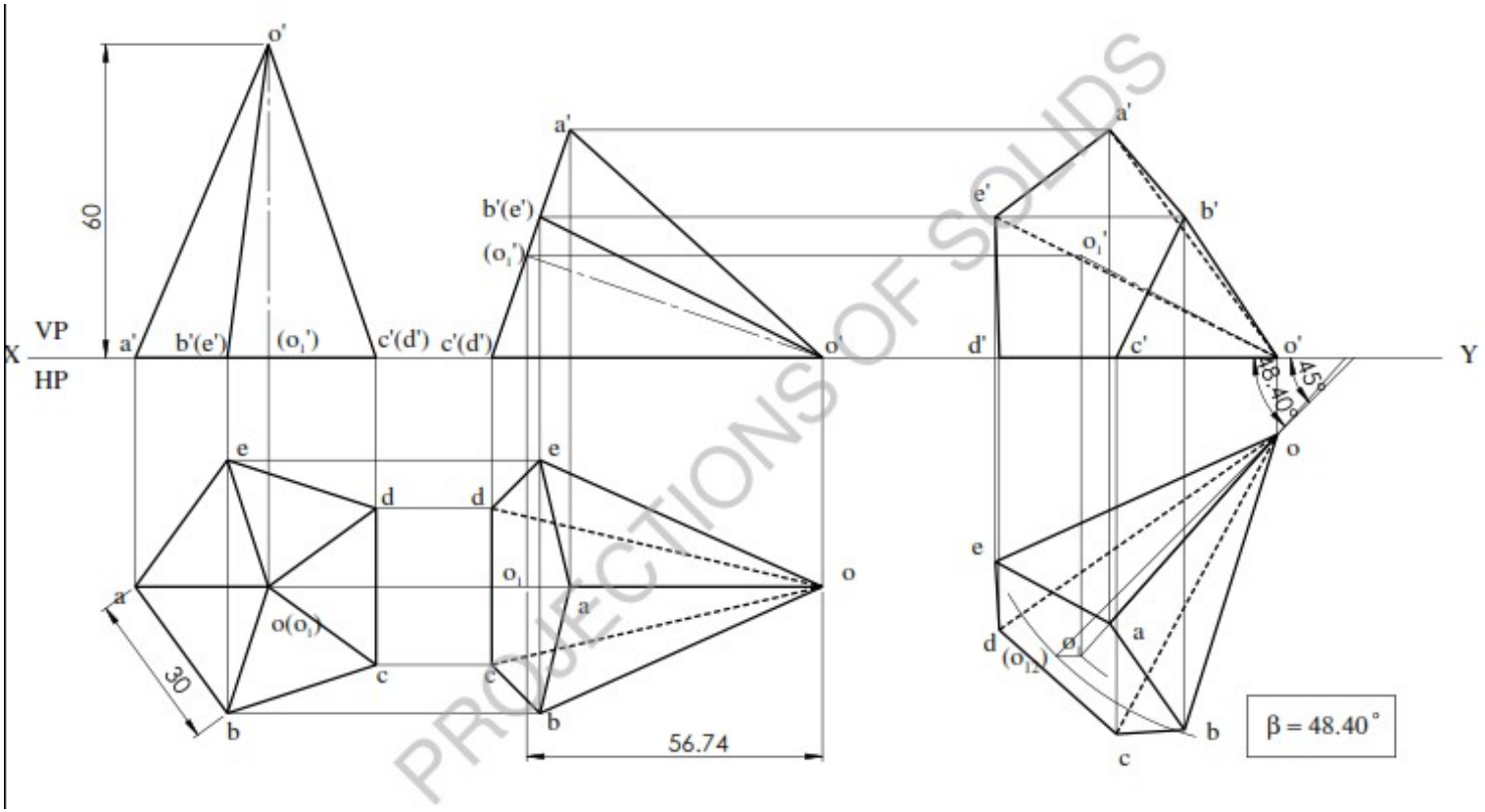
Problem 5.8: A square pyramid 30 mm base edge and 60 mm axis length rests on HP on one of its base corners such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections when the axis is inclined at 45^0 HP and top view of the axis makes 40^0 to XY line when the apex is nearer to the observer.



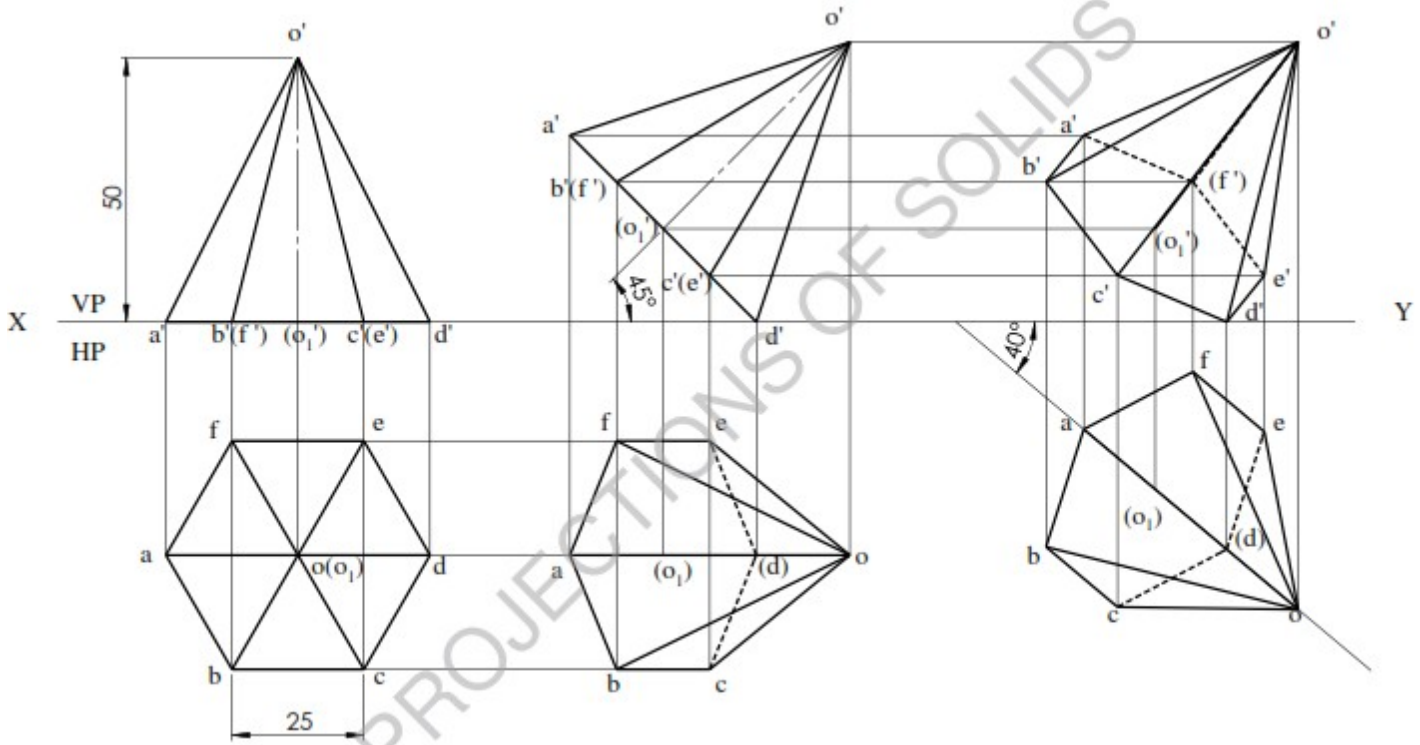
Problem 5.9: A pentagonal pyramid 30 mm base edges and 55 mm axis length rests on HP on one of its base edges. Draw the projections of the pyramid when the axis is inclined at 30^0 to HP and 45^0 to VP.



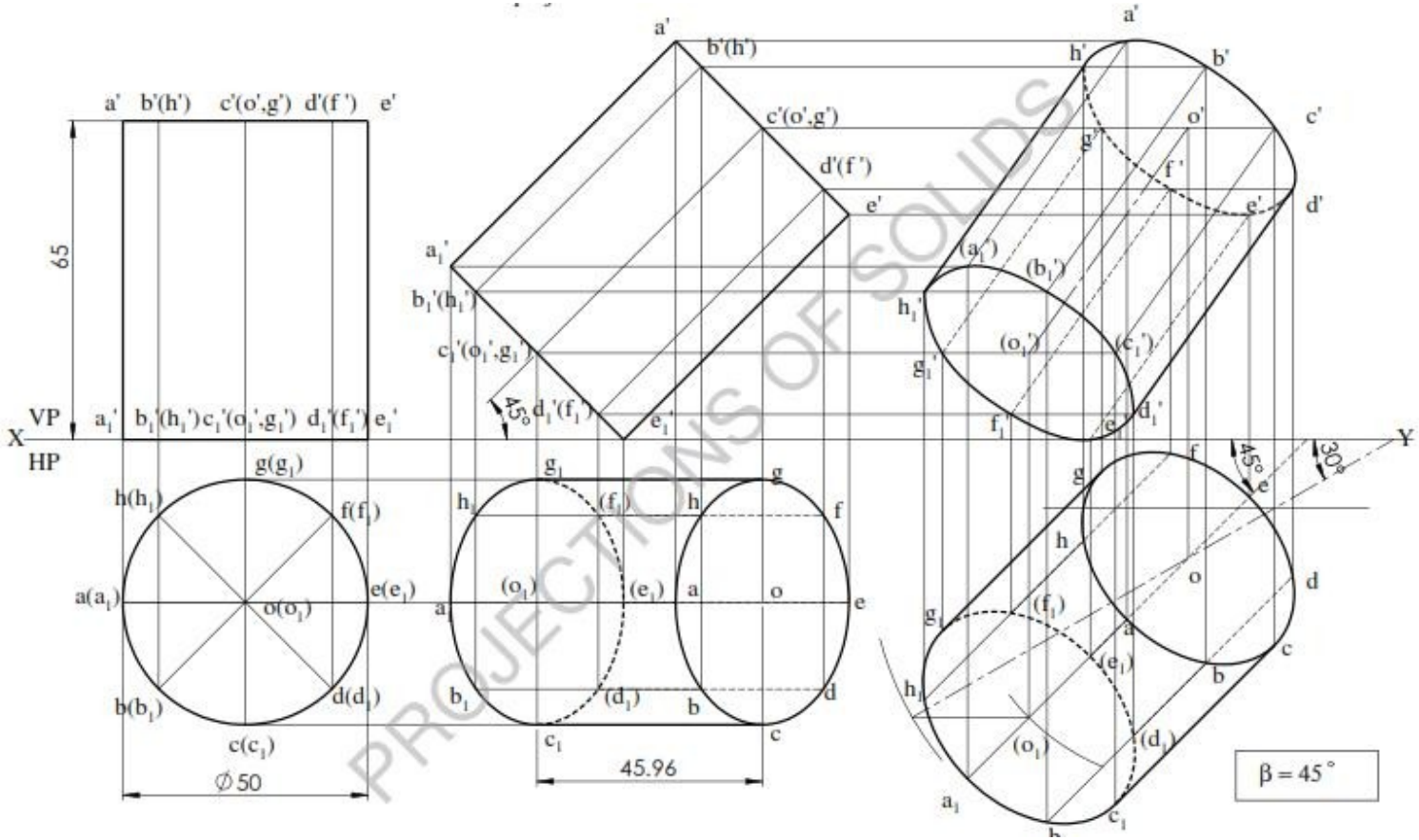
Problem 5.10: A pentagonal pyramid 30 mm base edges and 60 mm axis length rests on HP on one of its triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45^0 and the base is nearer to the observer.



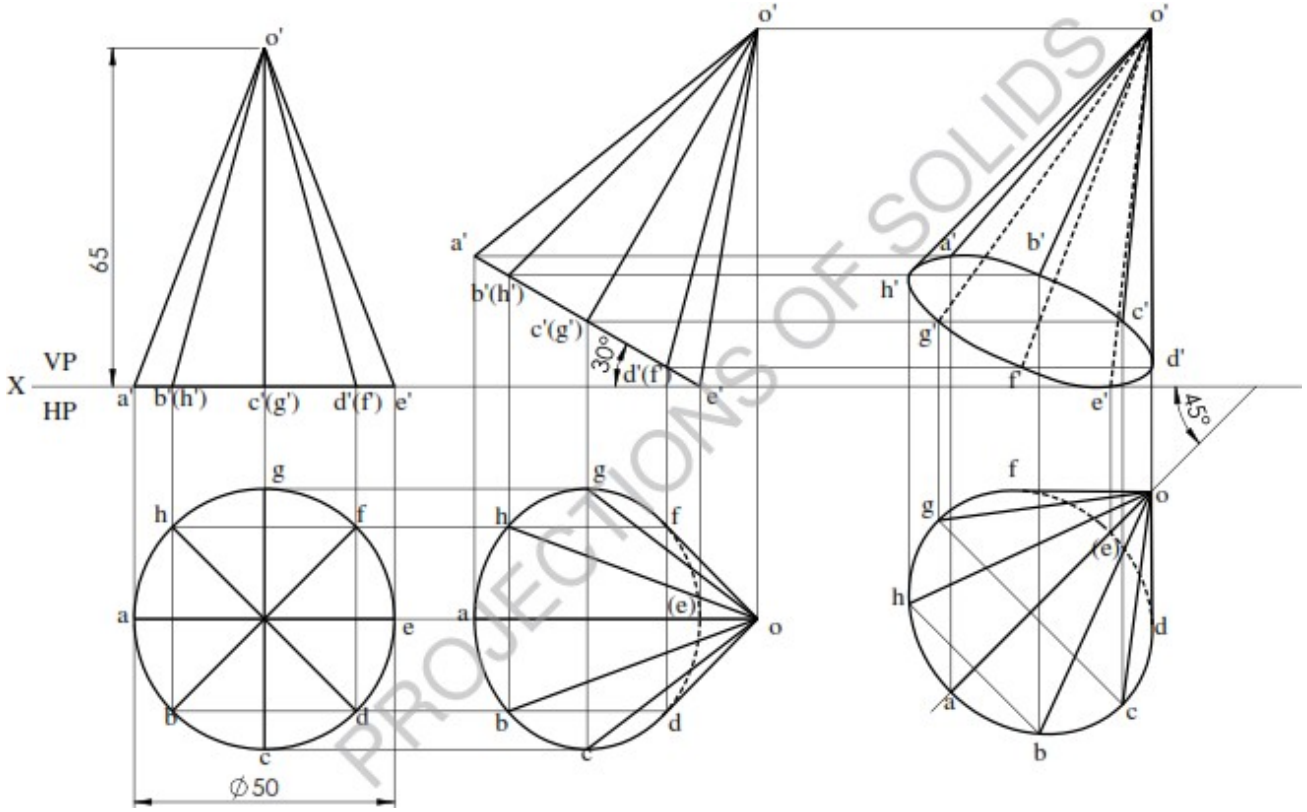
Problem 5.11: A hexagonal pyramid of base edge 25 mm and height 50 mm rests on HP on one of its base corners such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections when the axis is inclined at 45^0 to HP and top view of the axis makes 40^0 to XY line when the apex is nearer to the observer.



Problem 5.12: A cylinder of base circle diameter of 50 mm and 65 mm axis length rests on HP on one of its base point on HP with its axis inclined at 45^0 to HP and 30^0 to VP. Draw the projections.

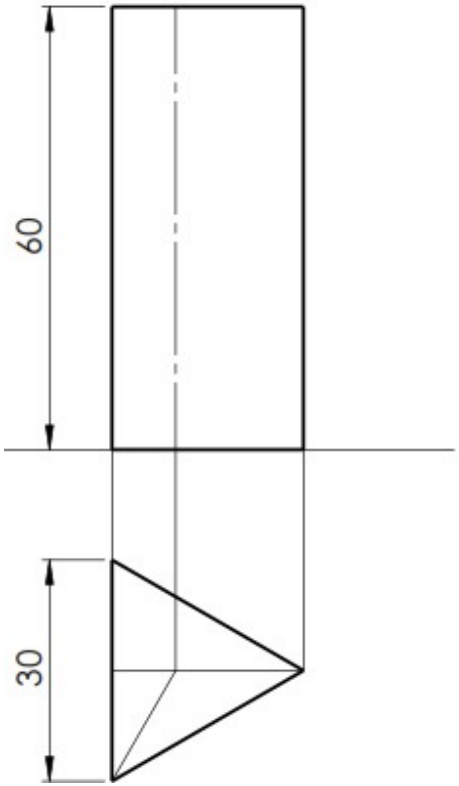


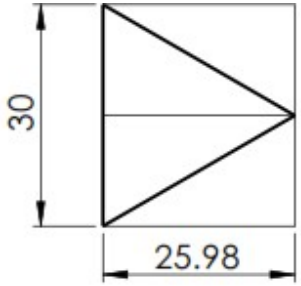
Problem 5.14: A cone of base circle diameter of 50 mm and 65 mm axis length is resting on a base point on HP. Base makes 30^0 to HP. Draw the projection of the cone when the axis appears to be inclined at 45^0 to VP.

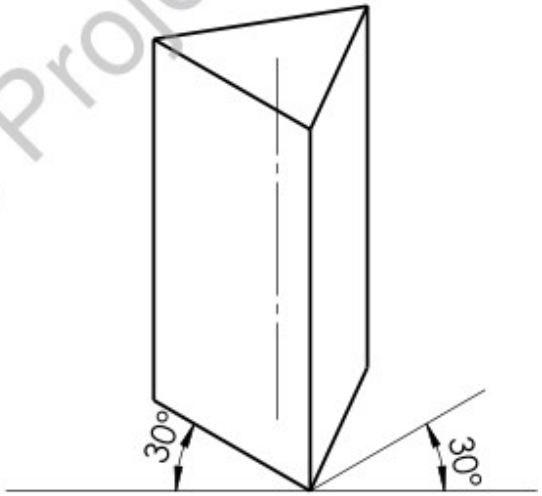


Isometric Projection

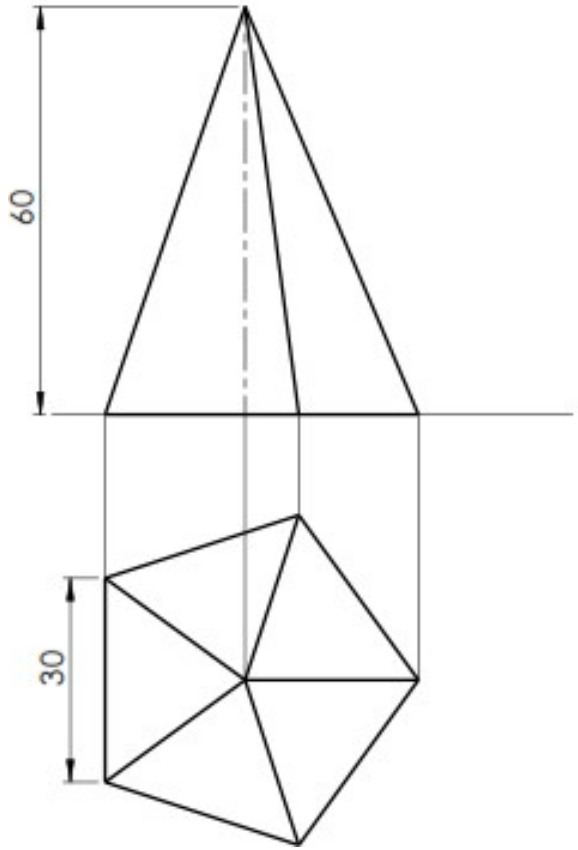
Problem 6.1: Draw the isometric projections of triangular prism of side of base 30 mm, axis 60 mm long. The prism is resting on its base on HP and an edge of base perpendicular to VP.

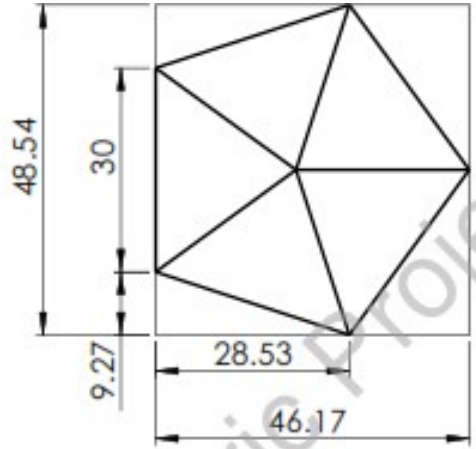


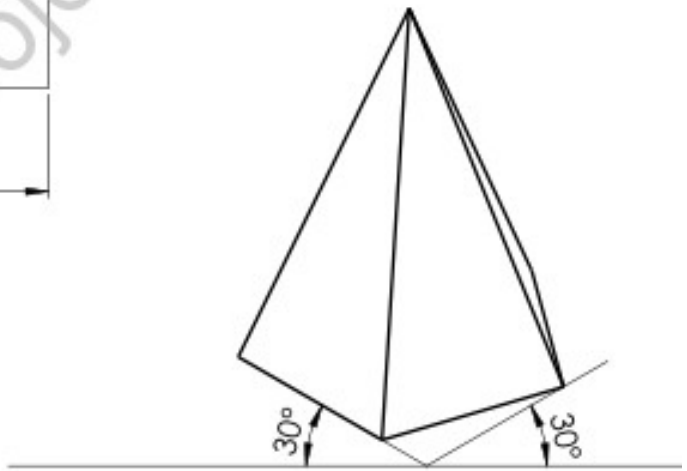




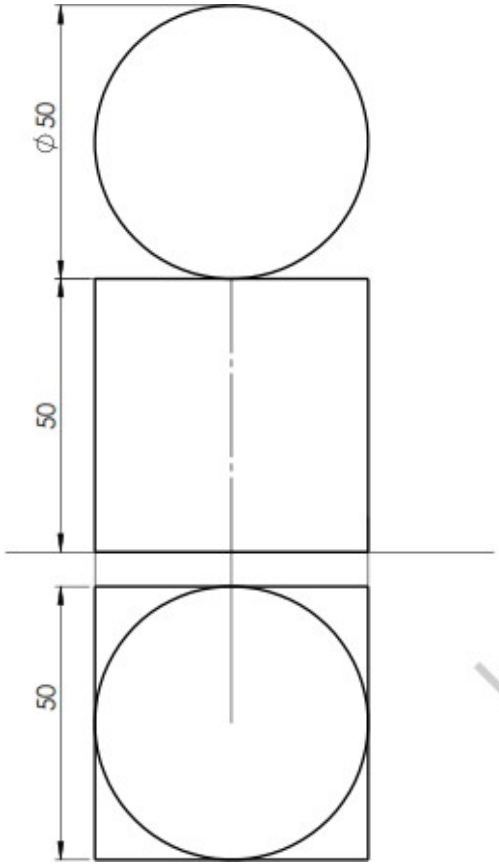
Problem 6.2: A pentagonal pyramid of base side 30 mm and axis length 60 mm is resting on HP on its base with a side of base perpendicular to VP. Draw its isometric projections.

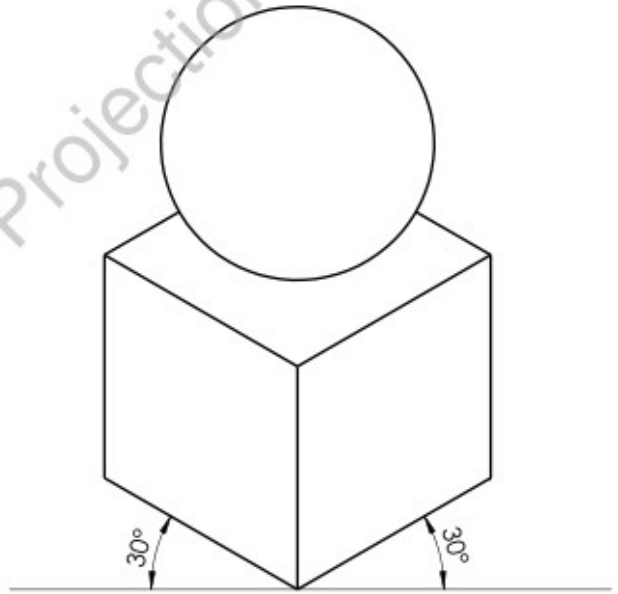




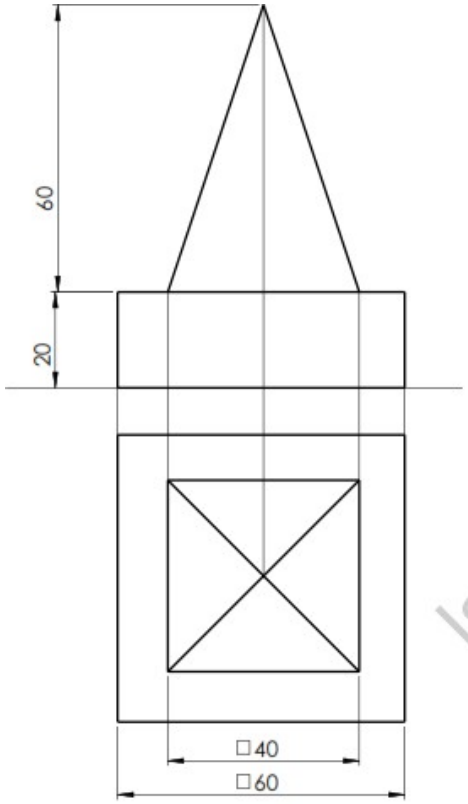


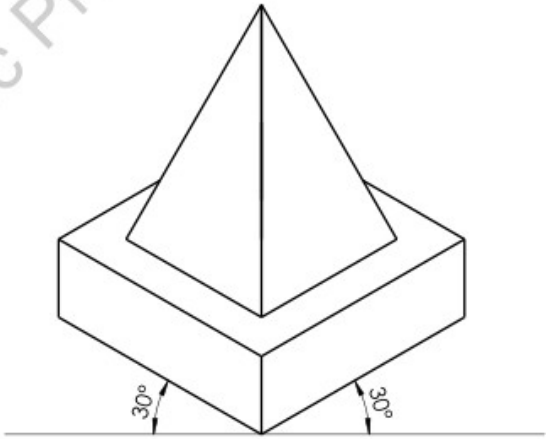
Problem 6.3: A sphere of diameter 50 mm rests centrally on top of a cube of sides 50 mm. Draw the isometric projections of the combination of solids.



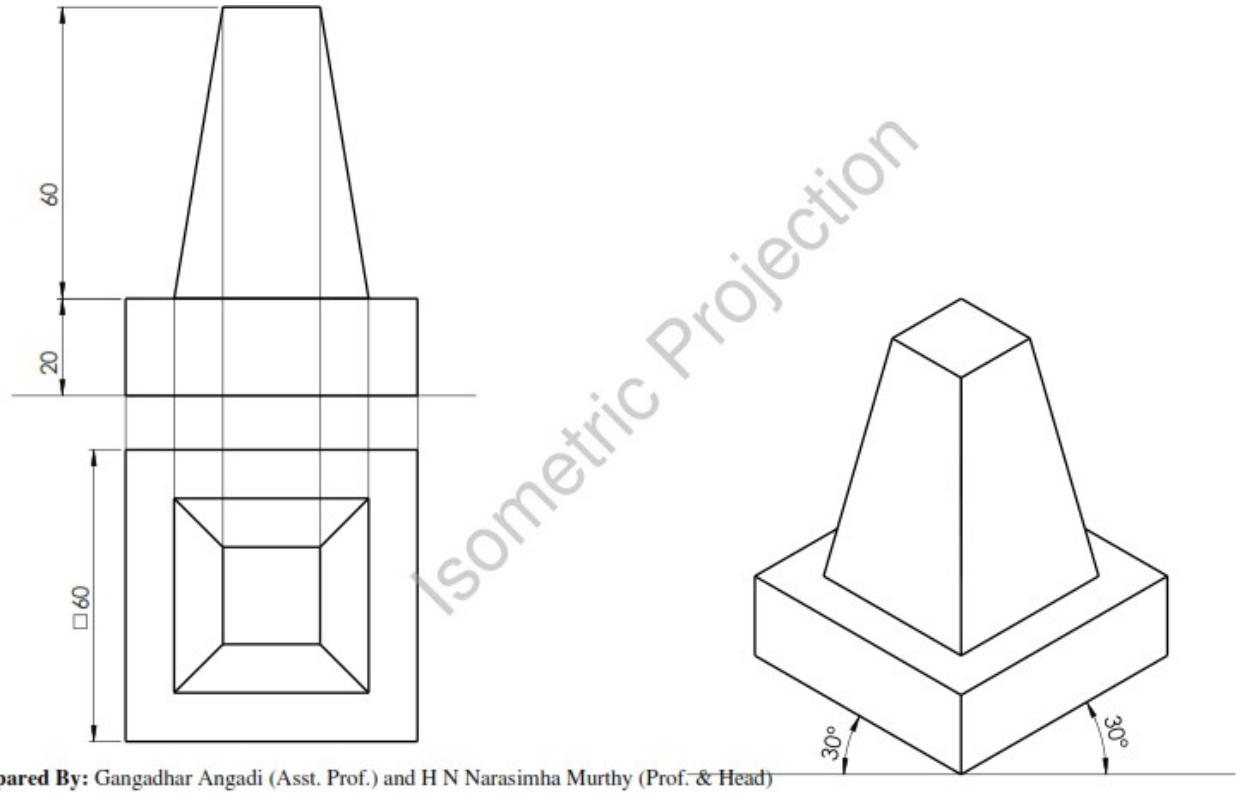


Problem 6.4: A square pyramid 40 mm side and height 60 mm rests on the center of the top of a square block of side 60 mm and height 20 mm. The base edge of the pyramid is parallel to the top edge of the square block. Draw the isometric projection of the combination of the solids.

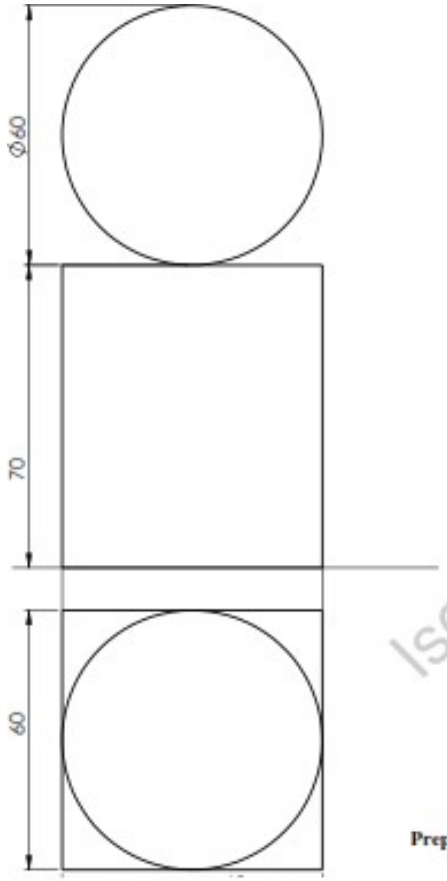


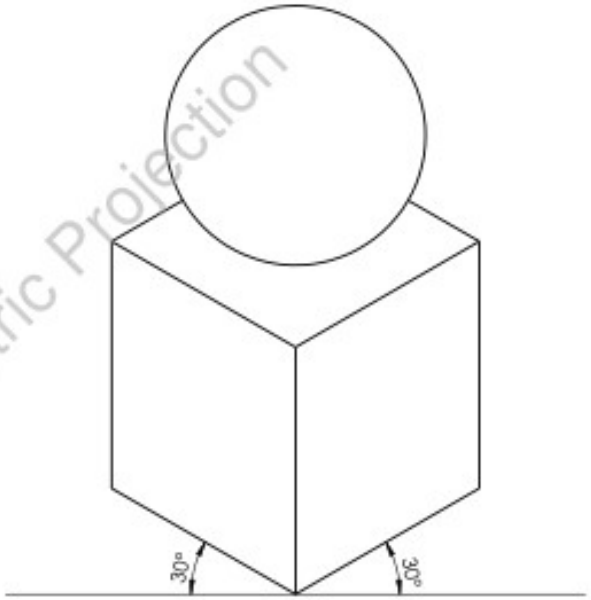


Problem 6.5: The frustum of a square pyramid of sides of top face 20 mm, bottom face 40 mm and height 60 mm rests centrally on top of a square block of side 60 mm and height 20 mm. The base edges of the pyramid are parallel to the top edges of the square block. Draw the isometric projection of combination of solids.



Problem 6.6: A sphere of diameter 60 mm is placed centrally on the top face of a square prism side 60 mm and height 70 mm. Draw the isometric projection of the combination.





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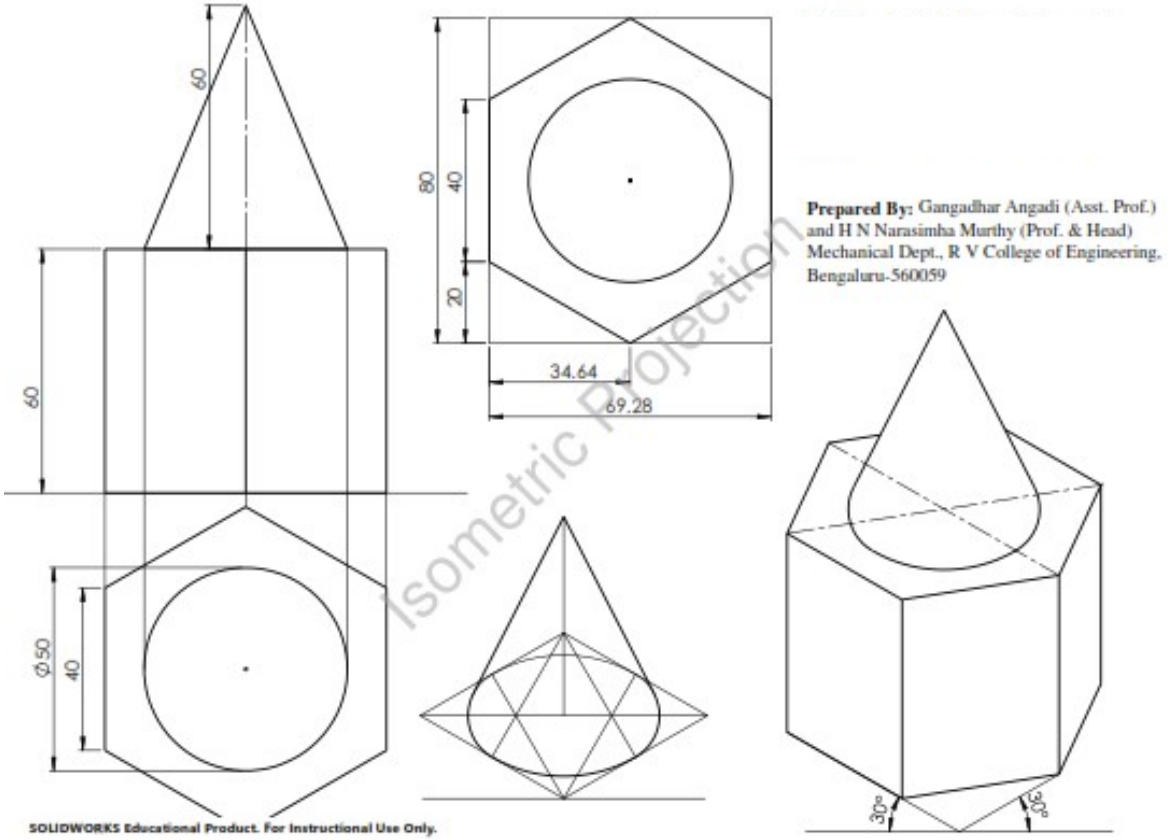
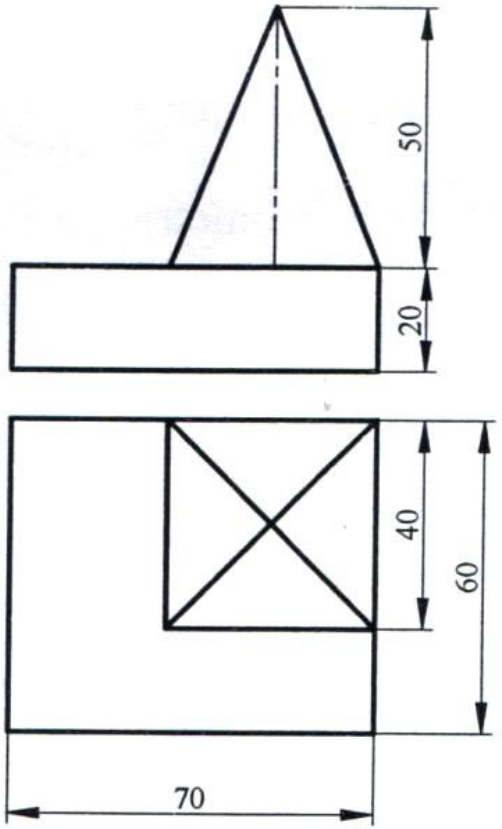
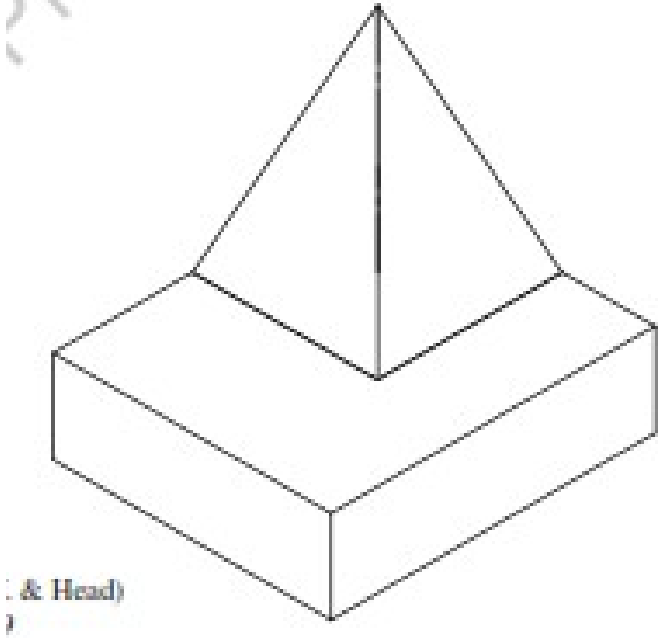
Problem 6.7/6.8: Draw the isometric projection of a hexagonal prism of side of base 40 mm and height 60 mm with a right circular cone of base 50 mm diameter and height 60 mm, resting on its top such that the axes are collinear.



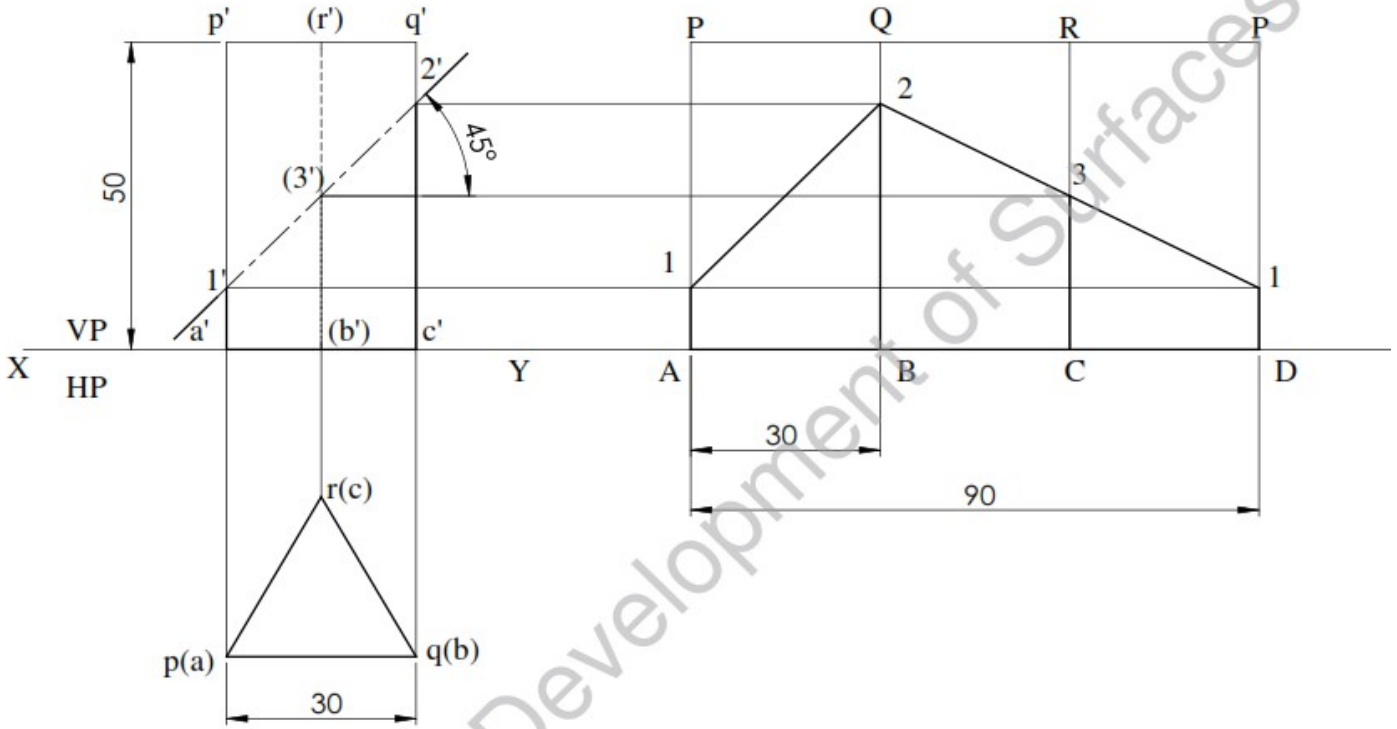
Problem 6.9: Draw the isometric projection of the combination of solids shown in fig.



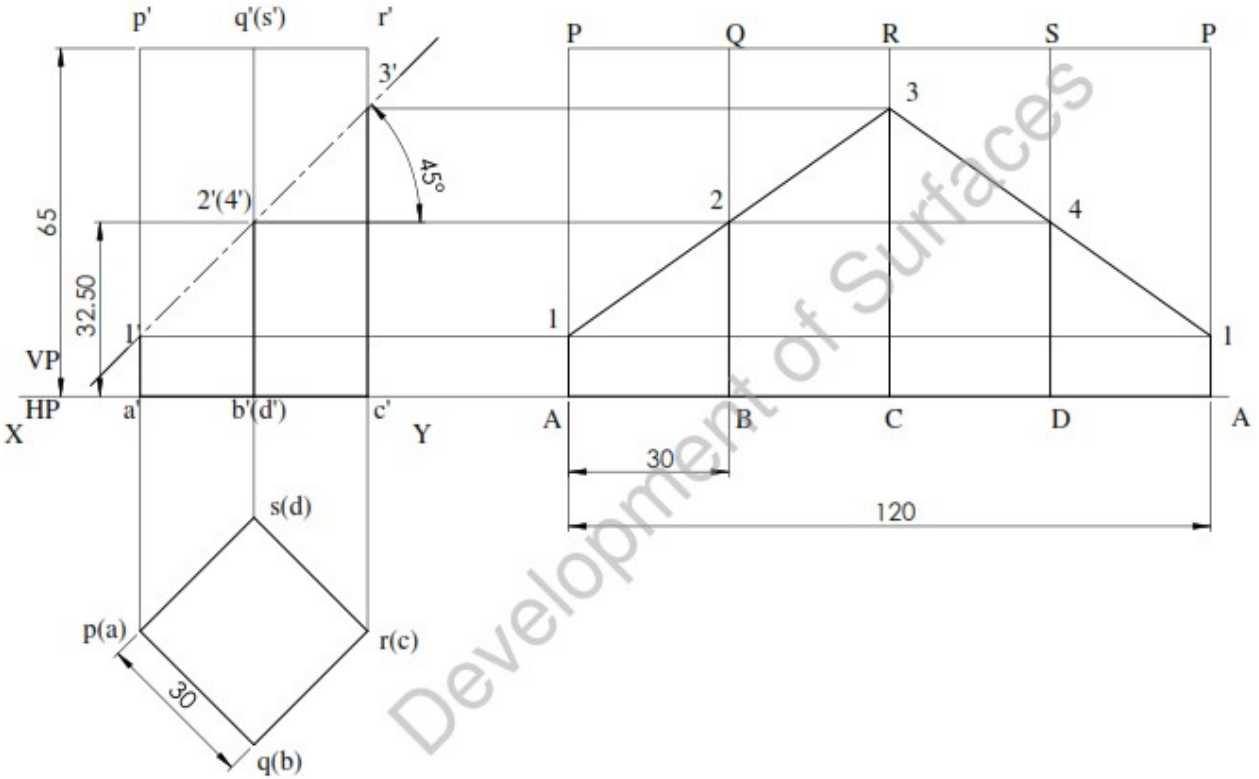


Development of surfaces

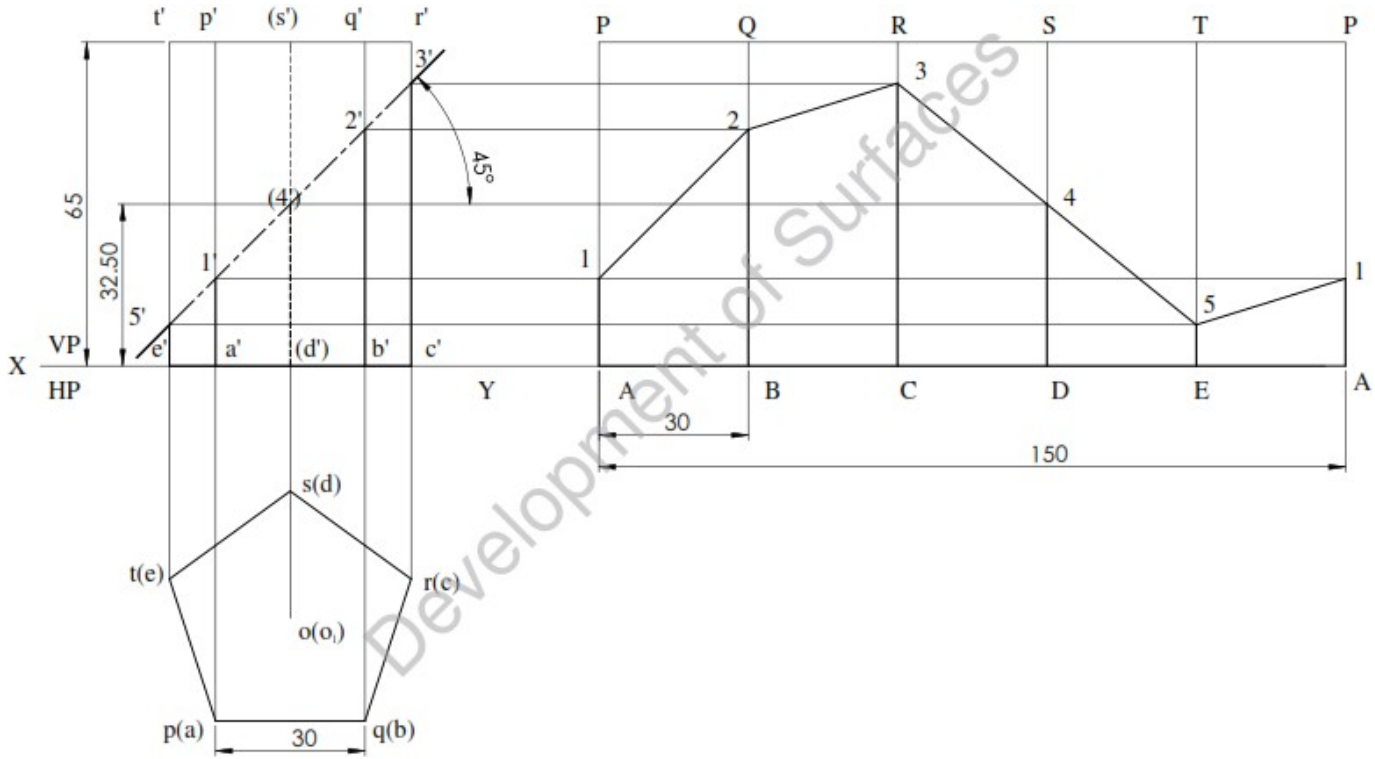
Problem 10.1: A triangular prism of base edge 30 mm and height 50 mm rests on HP with its axis vertical and a base edge parallel to VP and farther from it. A section plane perpendicular to VP and inclined at 45^0 to HP bisects the axis of the prism. Draw the development of lateral surface of retained portion of the solid.



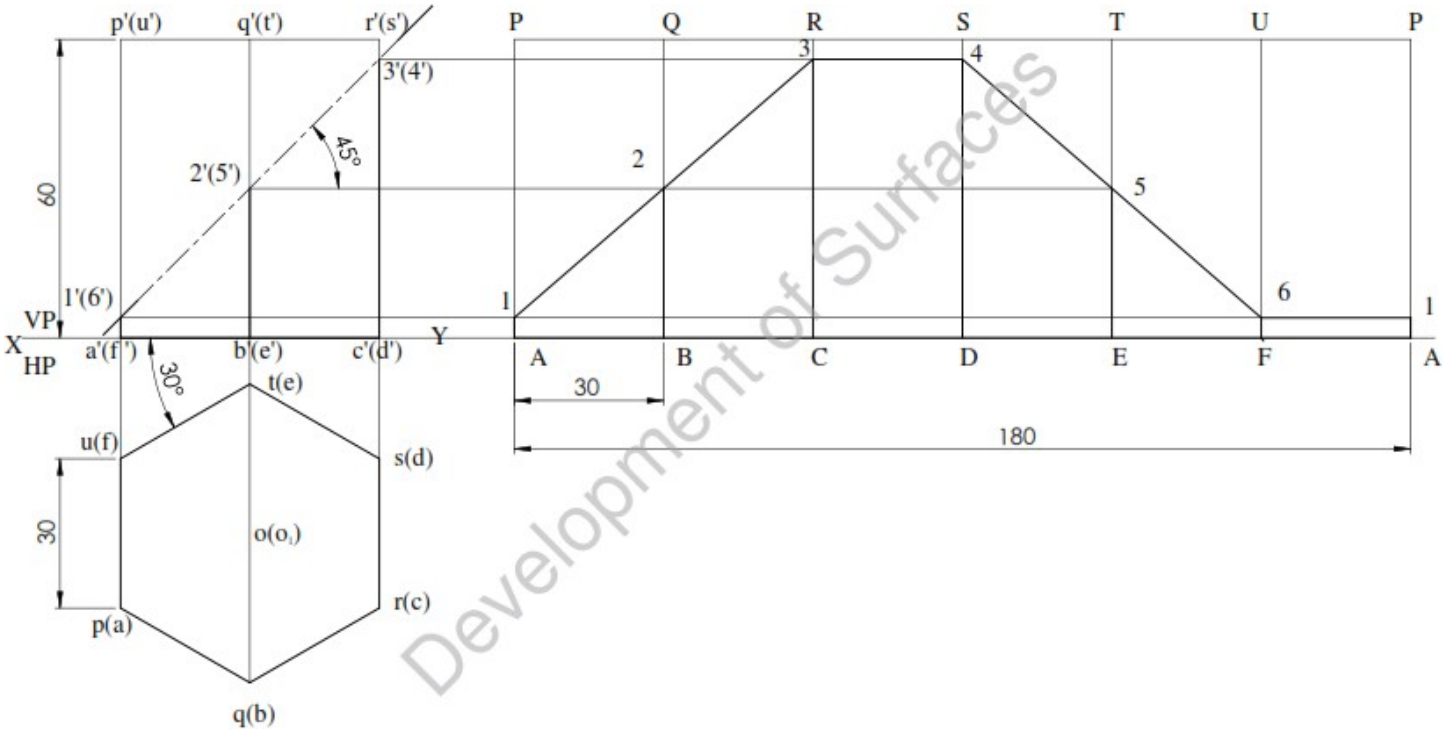
Problem 10.2: A square prism of 30mm base edges and 65 mm axis length rests on HP with its axis vertical and two of its lateral surfaces are equally inclined to VP. A section plane perpendicular to VP and inclined at 45^0 to HP bisects the axis of the prism. Draw the development of lateral surface of retained portion of the solid.



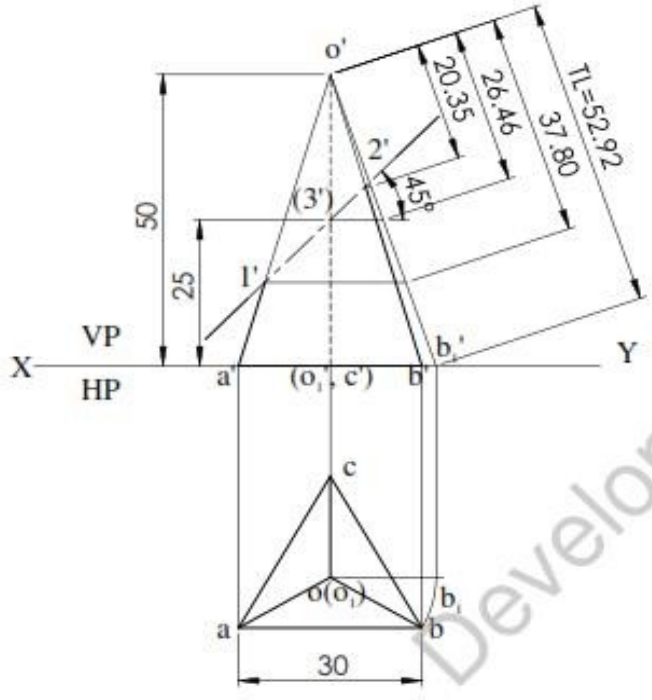
Problem 10.3: A pentagonal prism of 30mm base edges and 65 mm axis length rests on HP with two of its lateral surfaces are equally inclined to VP and nearer to it. A section plane perpendicular to VP and inclined at 45^0 to HP bisects the axis of the prism. Draw the development of lateral surface of retained portion of the solid.

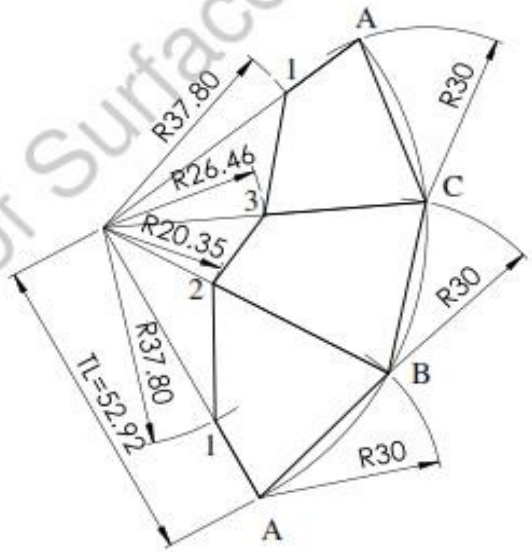


Problem 10.4: A hexagonal prism of 30mm base edges and 60 mm axis length rests on HP with its axis vertical and one of its lateral surfaces is inclined at 30^0 to VP and nearer to it. A section plane perpendicular to VP and inclined at 45^0 to HP bisects the axis of the prism. Draw the development of lateral surface of retained portion of the solid.

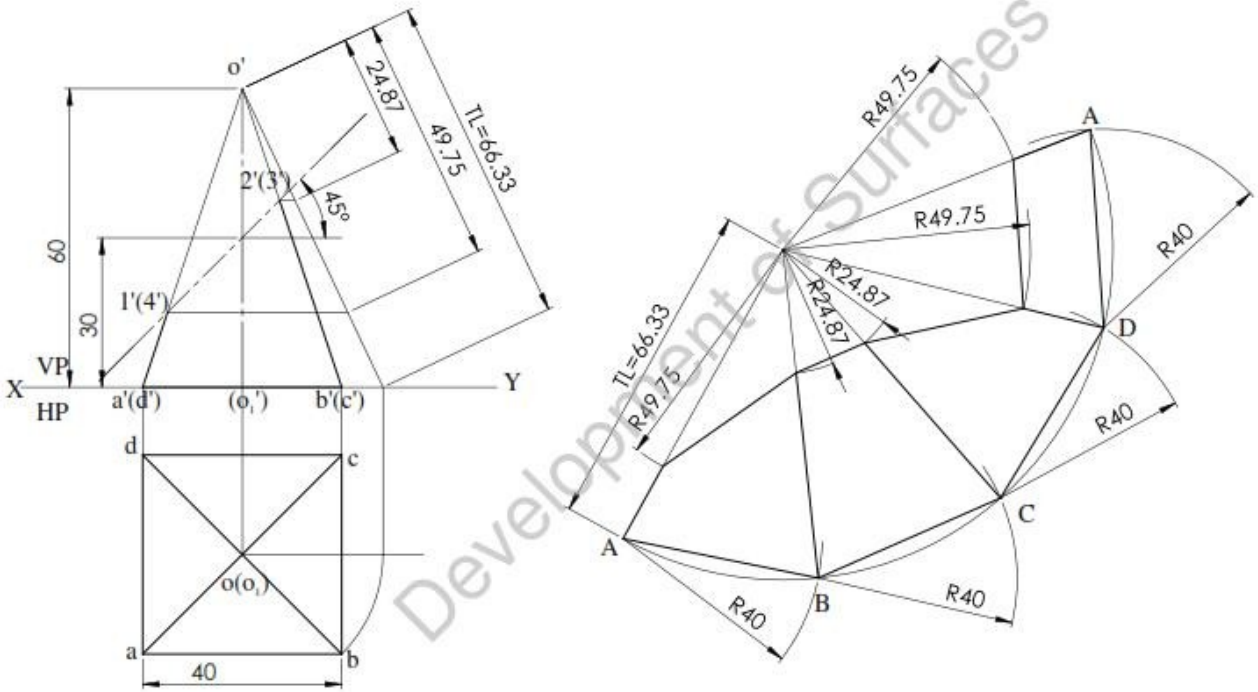


Problem 10.5: A triangular pyramid of base edge 30 mm and height 50 mm rests on HP with its axis vertical and two of its base edges equally inclined to VP and nearer to it. A section plane perpendicular to VP and inclined at 45^0 to HP bisects the axis of the pyramid. Draw the development of lateral surface of retained portion of the solid.

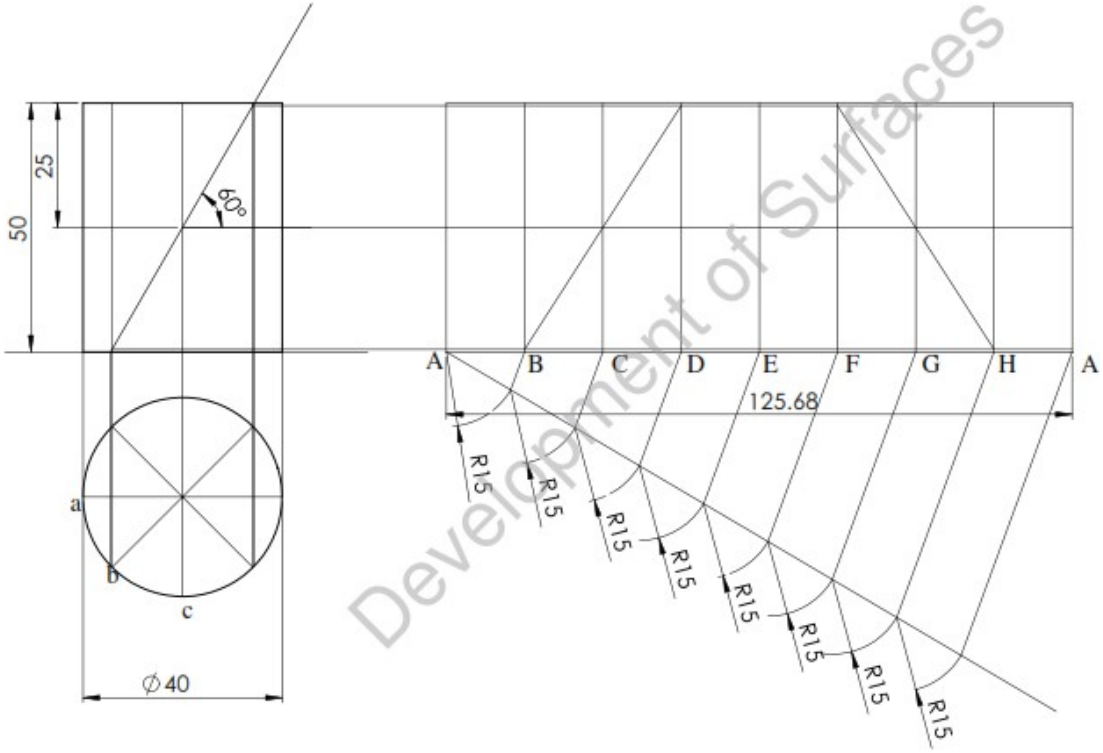




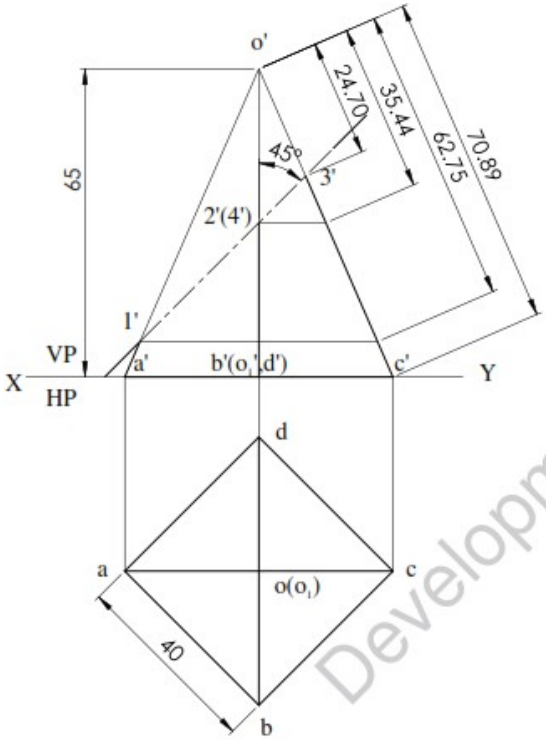
Problem 10.6: A square pyramid of base edge 40 mm and height 60 mm rests on HP with its axis vertical and two of its base edges parallel to VP. A section plane perpendicular to VP and inclined at 45^0 to HP bisects the axis of the pyramid. Draw the development of lateral surface of retained portion of the solid.

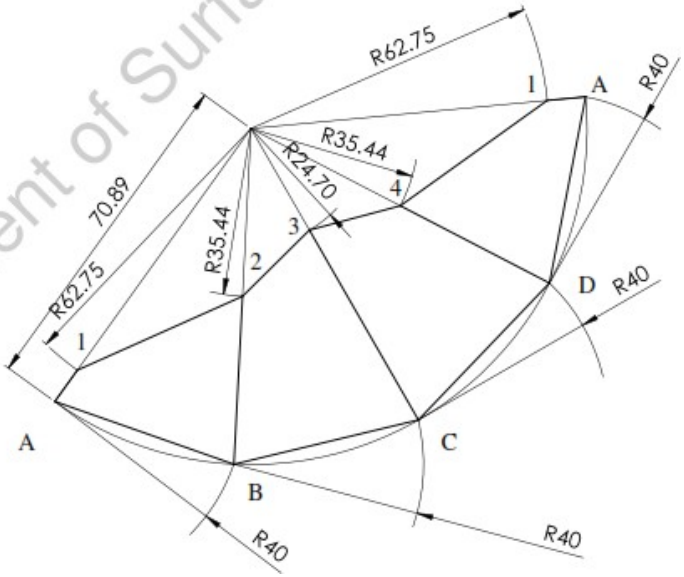


Problem 10.7: Draw the development of the lateral surface of a truncated cylinder, 40 mm diameter of base and height 50 mm, if the truncated flat surface of the cylinder bisects the axis at 60^0 to it.

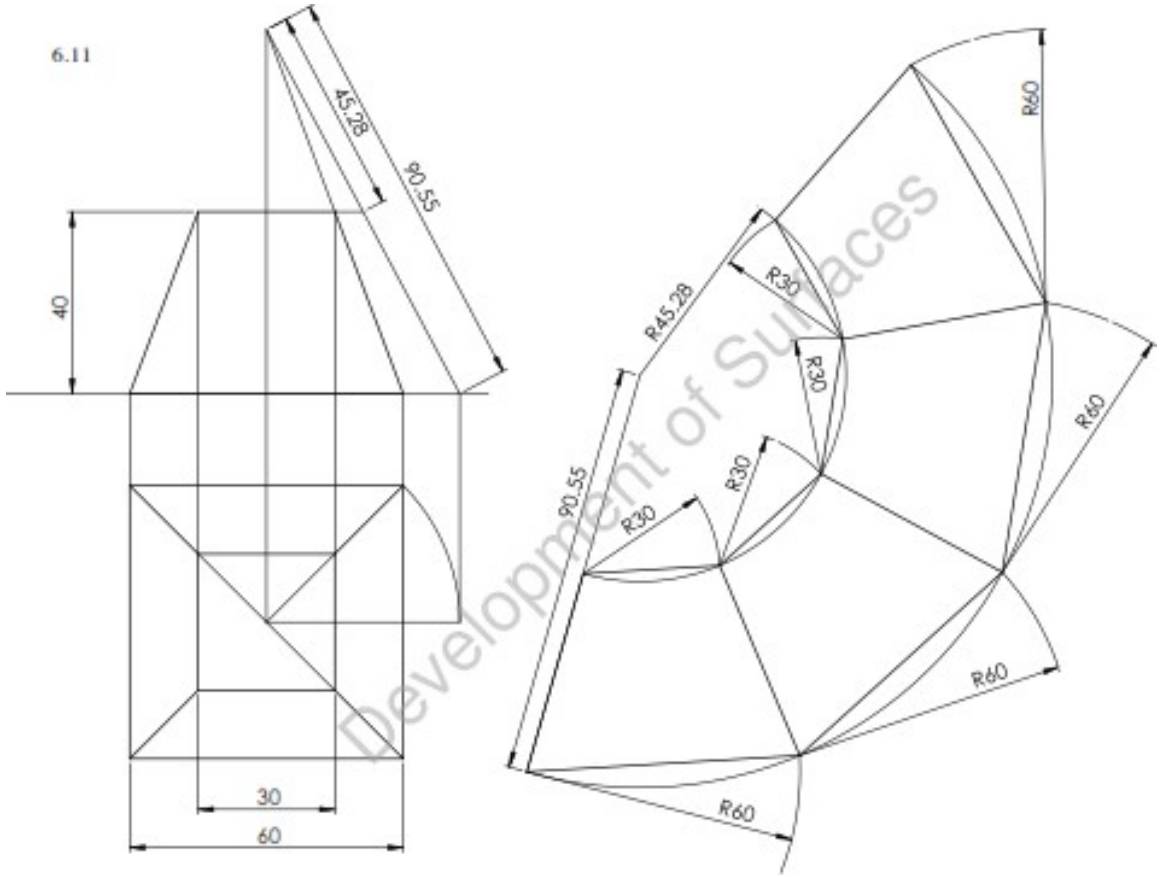


Problem 10.8: A square pyramid side of base 40 mm and axis 65 mm long has its base on HP and all the edges of the base are equally inclined to VP. It is cut with an inclined section plane so that the truncated surface is at 45^0 to the axis bisecting it. Draw the development of the truncated pyramid.

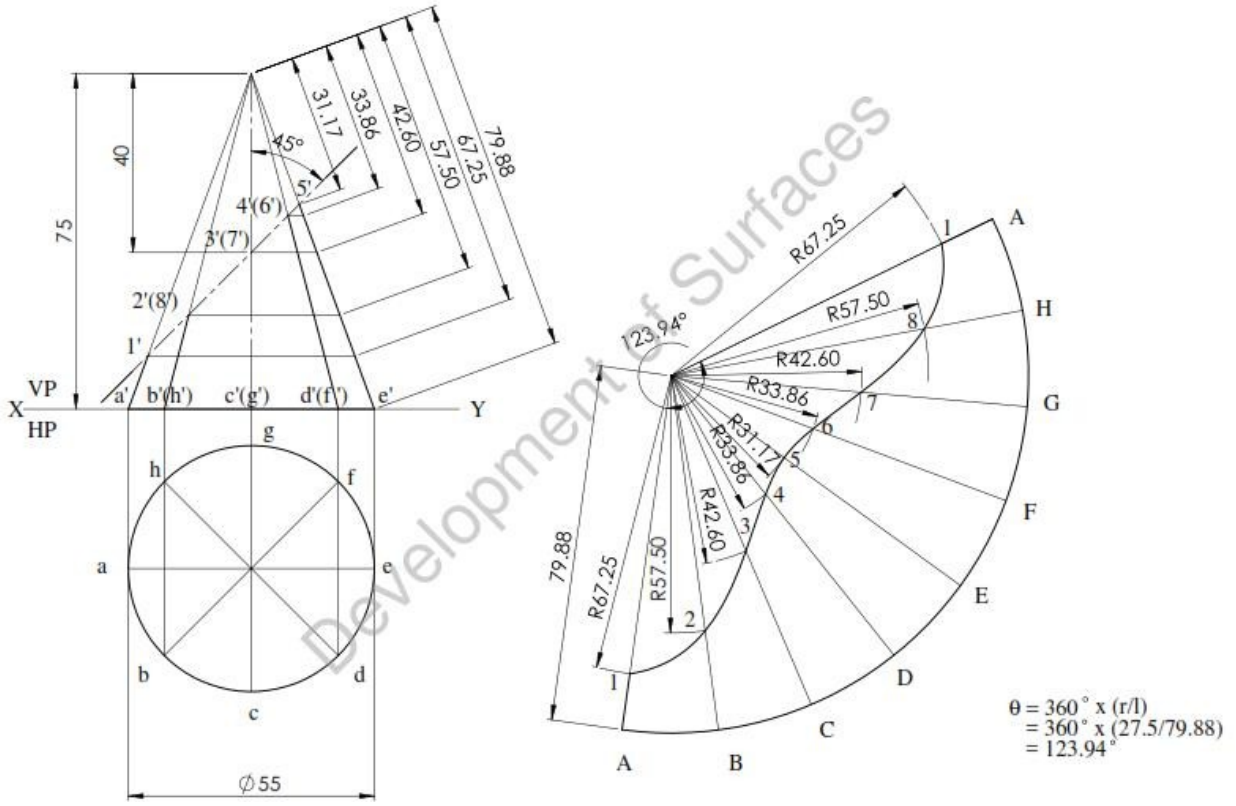




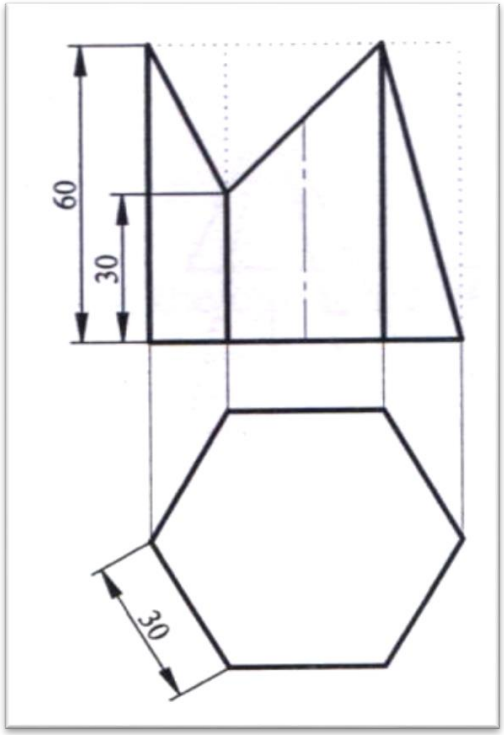
Problem 10.9: The frustum of a square pyramid has is base 60 mm sides, top face 30 mm and height 40 mm. Its axis is vertical and a side of base is parallel to VP. Draw the development of lateral surfaces.

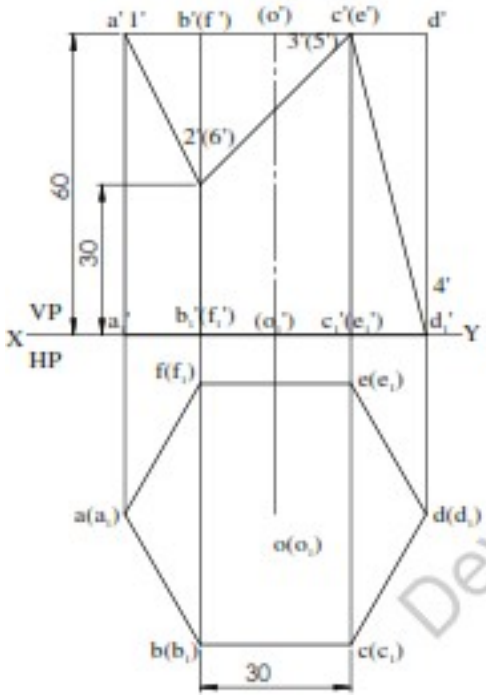


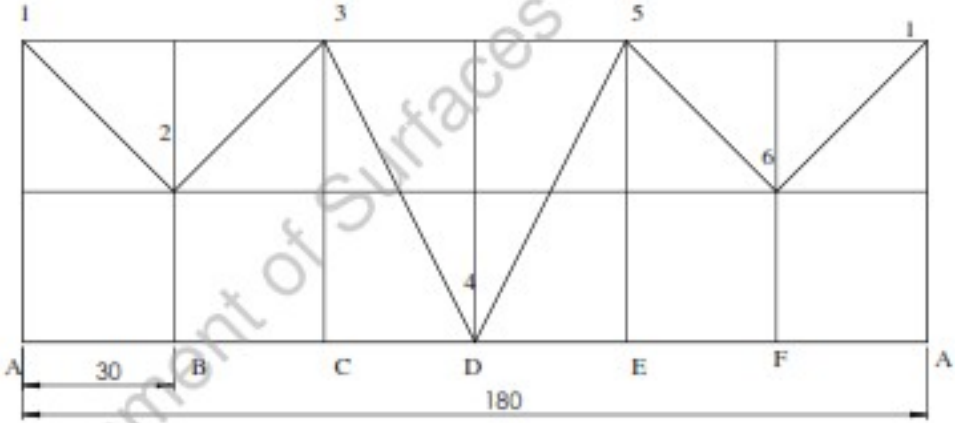
Problem 10.10: A right cone of 55 mm base diameter and 75 mm height stands on its base on HP. It is truncated with its surface inclined at 45^0 to the axis lying at a distance of 40 mm from the apex of the cone. Obtain the development of the lateral surface of the truncated cone.



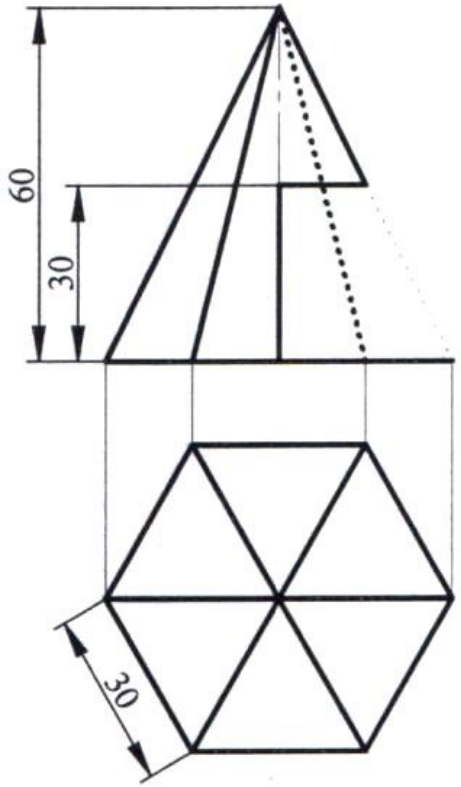
Problem 10.11: A hexagonal prism side of base 30mm and height 60mm is cut as shown in the fig. Draw the development of the lateral surface of the prism.

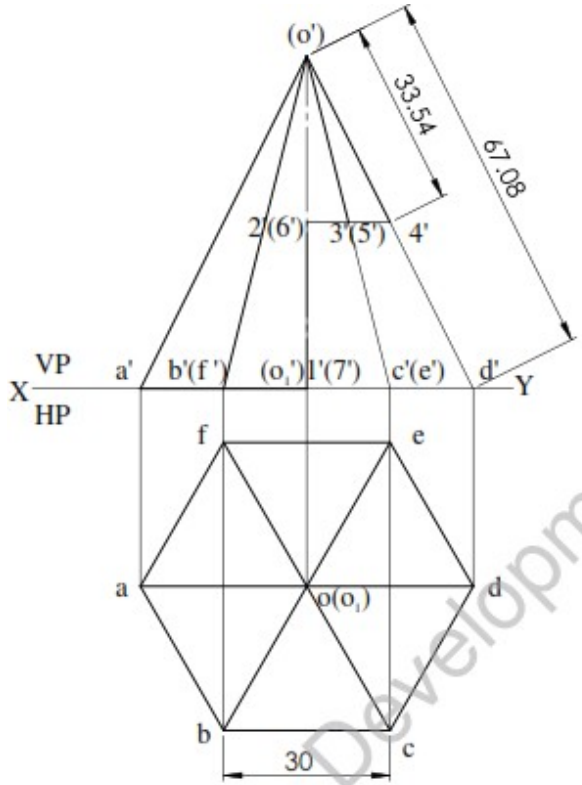


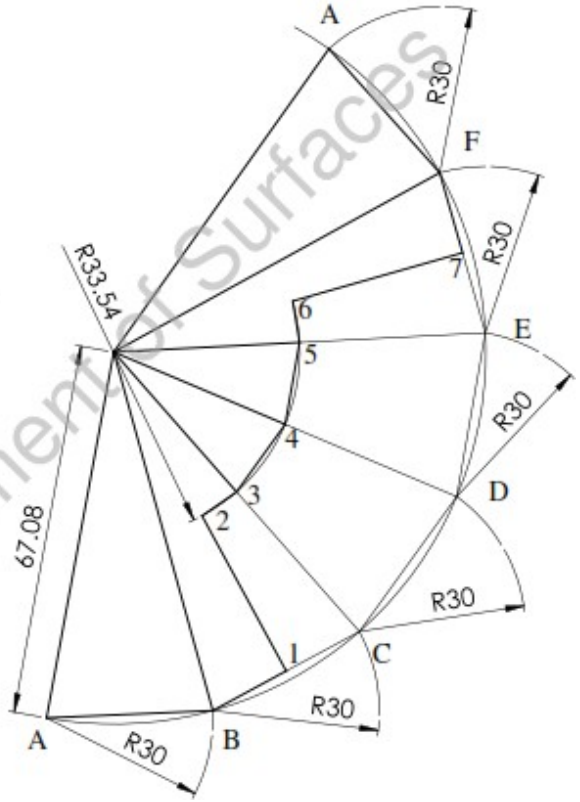




Problem 10.12: Draw the development of the lateral surface of the pyramid shown in fig.








Thank You