

Swapnil Rao's CAED compilation

CSE(CY); 3rd semester

Preface: over 120 hours put on the book, would appreciate if credits are given during this PDF's circulation / distribution

DEPARTMENT OF MECHANICAL ENGINEERING
RAMAIAH INSTITUTE OF TECHNOLOGY, BENGALURU-560054
(Autonomous Institution affiliated to VTU, Belagavi)

SKETCH BOOK cum RECORD

**Course: COMPUTER AIDED ENGINEERING DRAWING /
MACHINE DRAWING**

Course code: MELC 28

Name of the student : SWAPNIL RAO

Roll No. / U

Branch : CSE (Cyber Security)

Term : June (1/6/23) to 9/9/2023 (Sept)

Faculty In-charge

“Drawing is the language of Engineers”

INDEX SHEET

Part 1 : Sketch work & Lab work

Sl. No.	Particulars	Marks			Initials of the faculty in- charge
		Sketch Work (Out of 15)	Lab work (Out of 15)	Total (Out of 30)	
1	Projection of planes -1	15	-	30	J
2	Projection of planes -2	15	-	30	J
3	Projection of planes -3	15	-	30	J
4	Developments - 1	15	15	30	J
5	Developments - 2	15	15	30	J
6	Projection of solids - 1	15	15	30	J
7	Projection of solids - 2	15	15	30	J
9	Projection of solids - 3	15	15	30	J
9	Projection of solids - 4	15	15	30	J
10	Isometric Projection - 1	15	15	30	J
11	Isometric Projection - 2	15	15	30	J
12	Isometric Projection - 3	15	15	30	J
13	Isometric Projection - 4	15	15	30	J
14					
15					
16					
	TOTAL marks =	390	out of	390	Total out of 30 marks 30

Part 2 : Tests

Part 3 : Assignments

	Test 1		Test 2		Assignment 1		Assignment 2		
Marks	Max.	Obtained	Max.	Obtained	Max.	Obtained	Max.	Obtained	
	10	10	10	10	05	05	05	05	
Initials of faculty in-charge									
TOTAL test marks	10		out of 10		Total assignment marks = 09 out of 10				

CERTIFICATE

This is to certify that _____ bearing USN/Roll No. _____ has satisfactorily completed the course titled "Computer Aided Engineering Drawing / Machine Drwing " (_____) as part of the BE program of the institute.

Final Marks	49
	50

Signature of the Batch In-charge
Date : _____

PLANES:

REFERENCE PLAYLIST:

**[https://www.youtube.com/watch?
v=e25UM72eNkM&list=PLDN15nk5uLiBVR
22X01vcnvVCuQIkIXGx](https://www.youtube.com/watch?v=e25UM72eNkM&list=PLDN15nk5uLiBVR22X01vcnvVCuQIkIXGx)**

26-6-23

KAED

Assignment

Name Swapnil Rao

Total: 12 questions

Branch: Cyber Security
[CSECCY]

Subject code: MELC 28

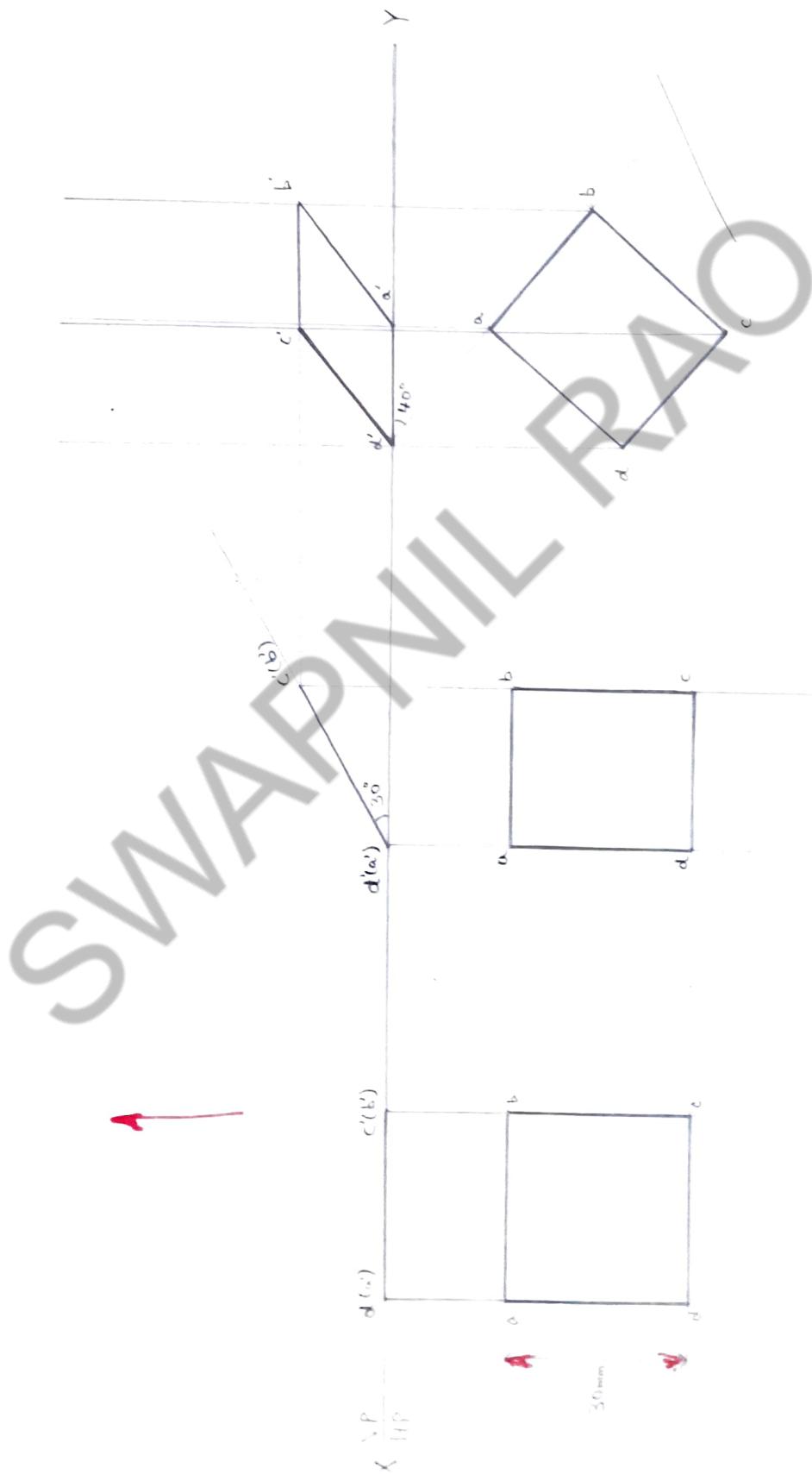
15
15

26/6

SWAPNIL RAO

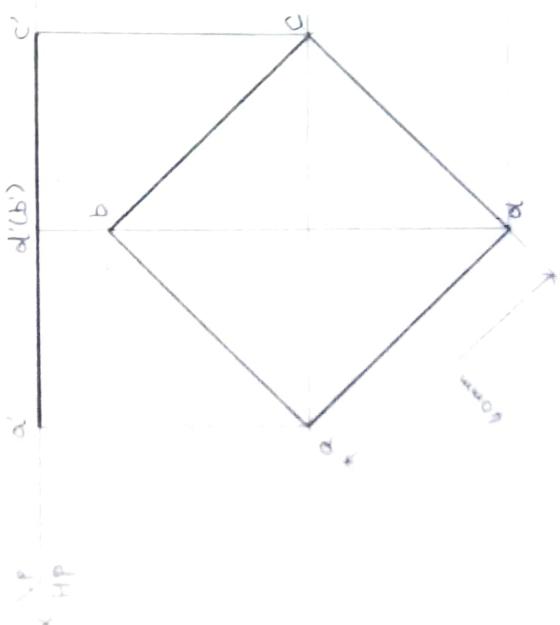
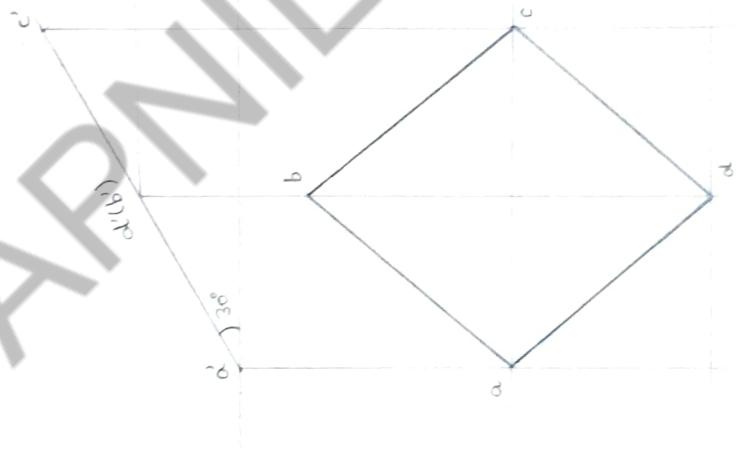
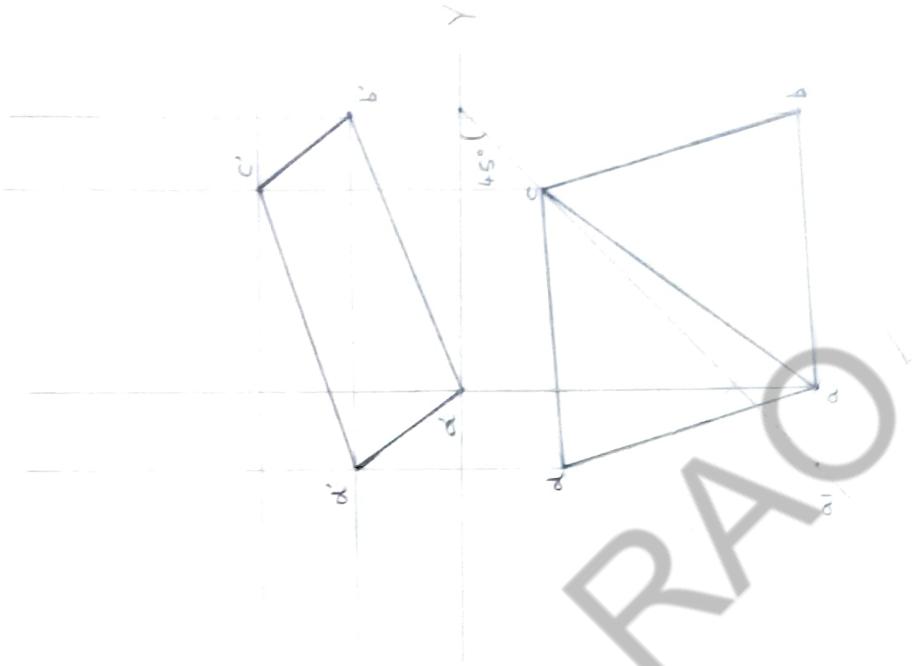
A square lamina of 30mm side rests on H.P. on one of its edge. The edge on which it rests makes an angle of 40° to V.P. and 30° to H.P. Draw the projections of the lamina.

Ans



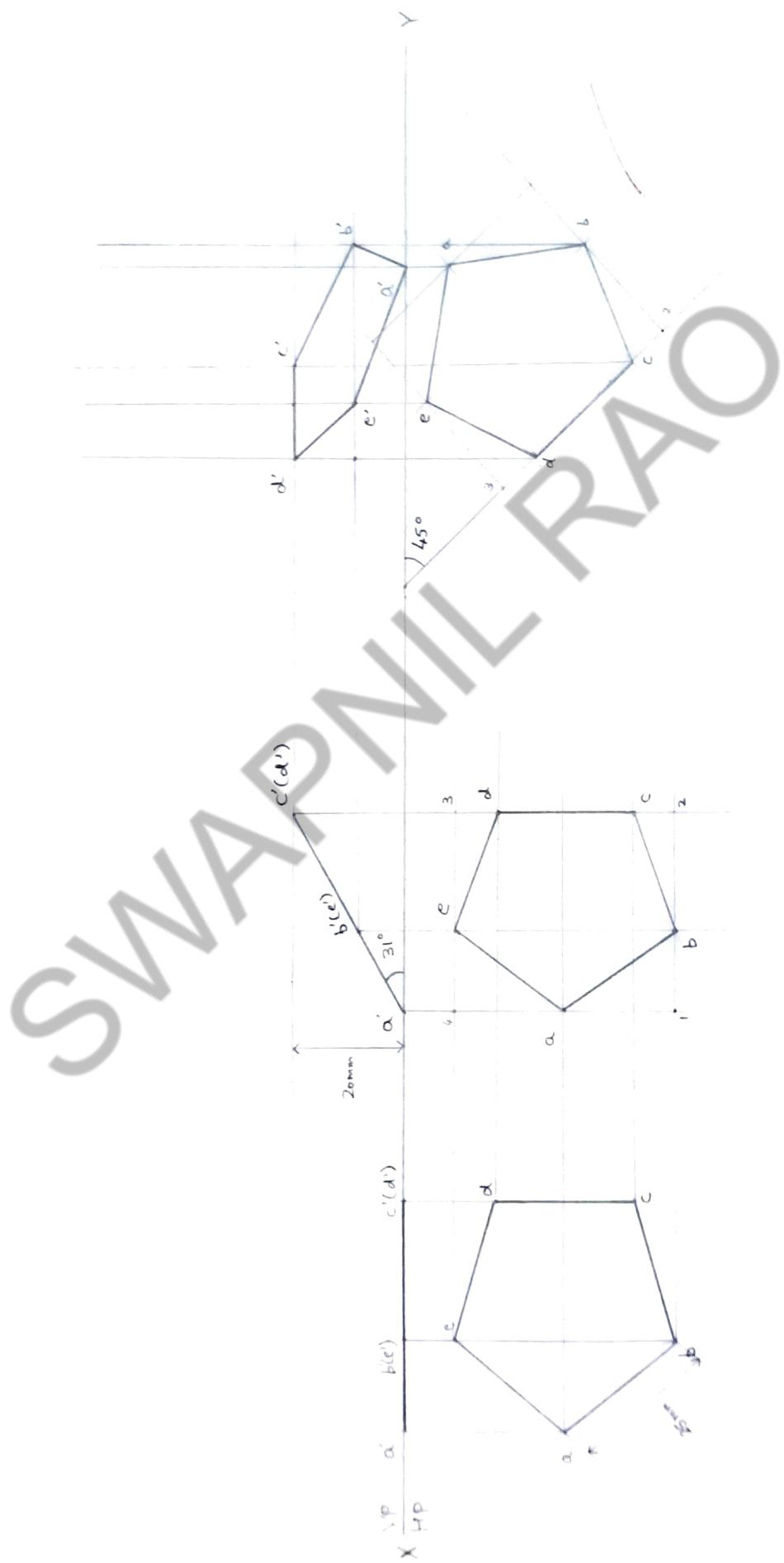
A square plate/lamina of 40mm sides rests on H.P such that one of the diagonals is inclined at 30° to H.P and 45° to V.P Draw its projections

Ans

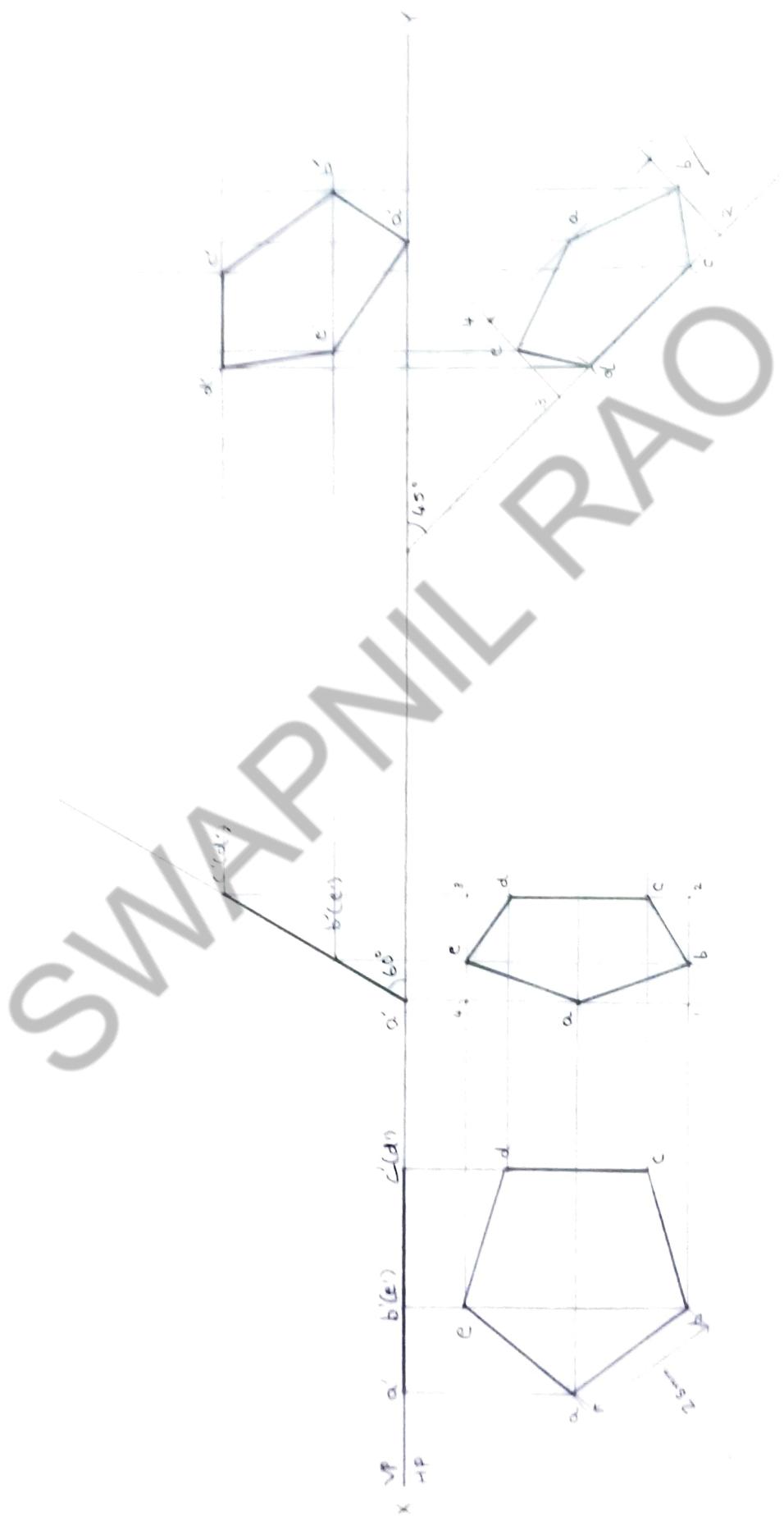


A pentagonal lamina of edges 25 mm is resting on HP with one of its angles such that the edge opposite to this corner is 20 mm above HP & makes an angle 45° with VP. Draw projections & determine inclination with HP.

Ans:

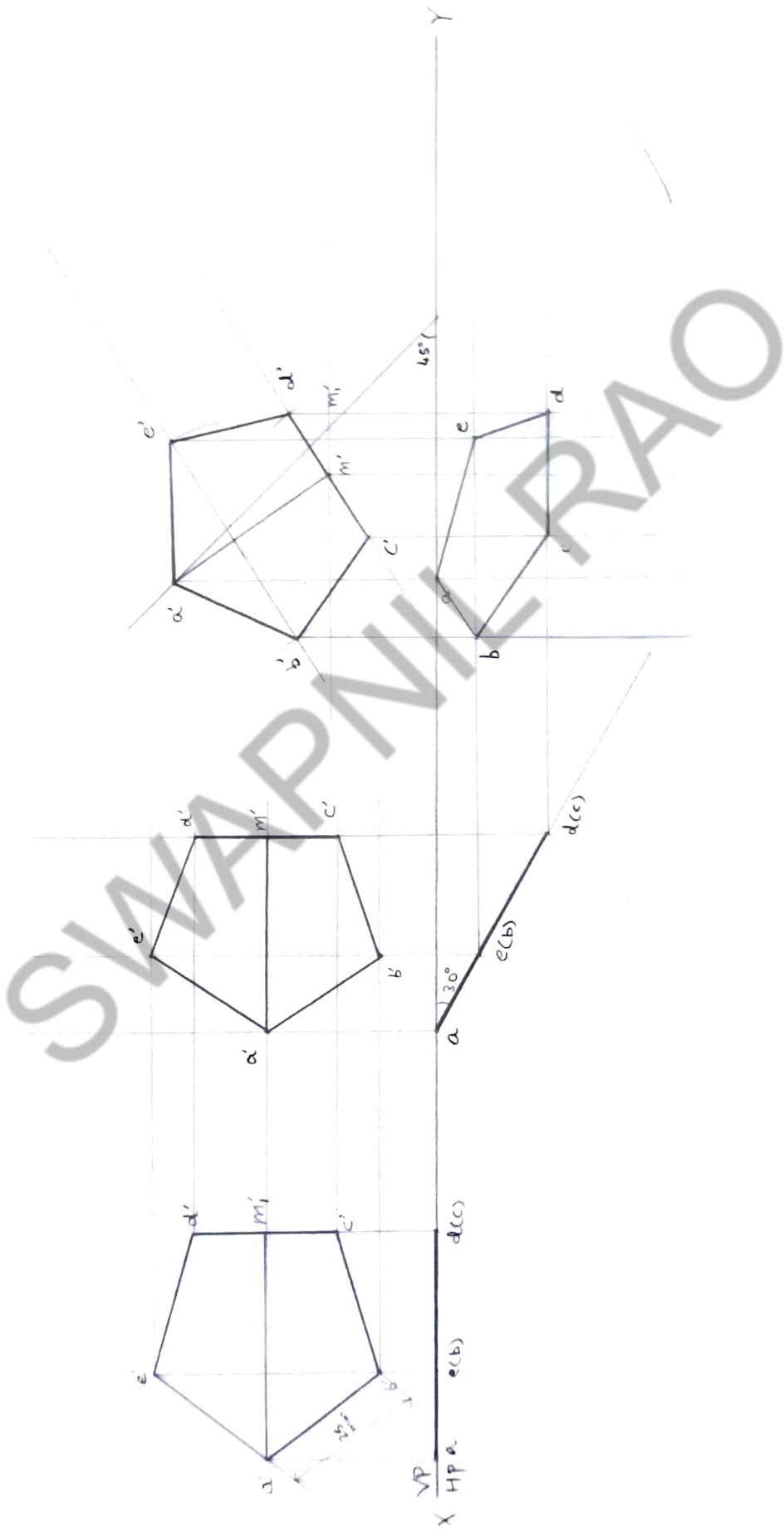


(A pentagonal lamina of edges 25mm is resting on H.P. with one of its sides such that the surface makes an angle 60° with H.P. The edge on which it rests is inclined at 45° to V.P. Draw its projections.



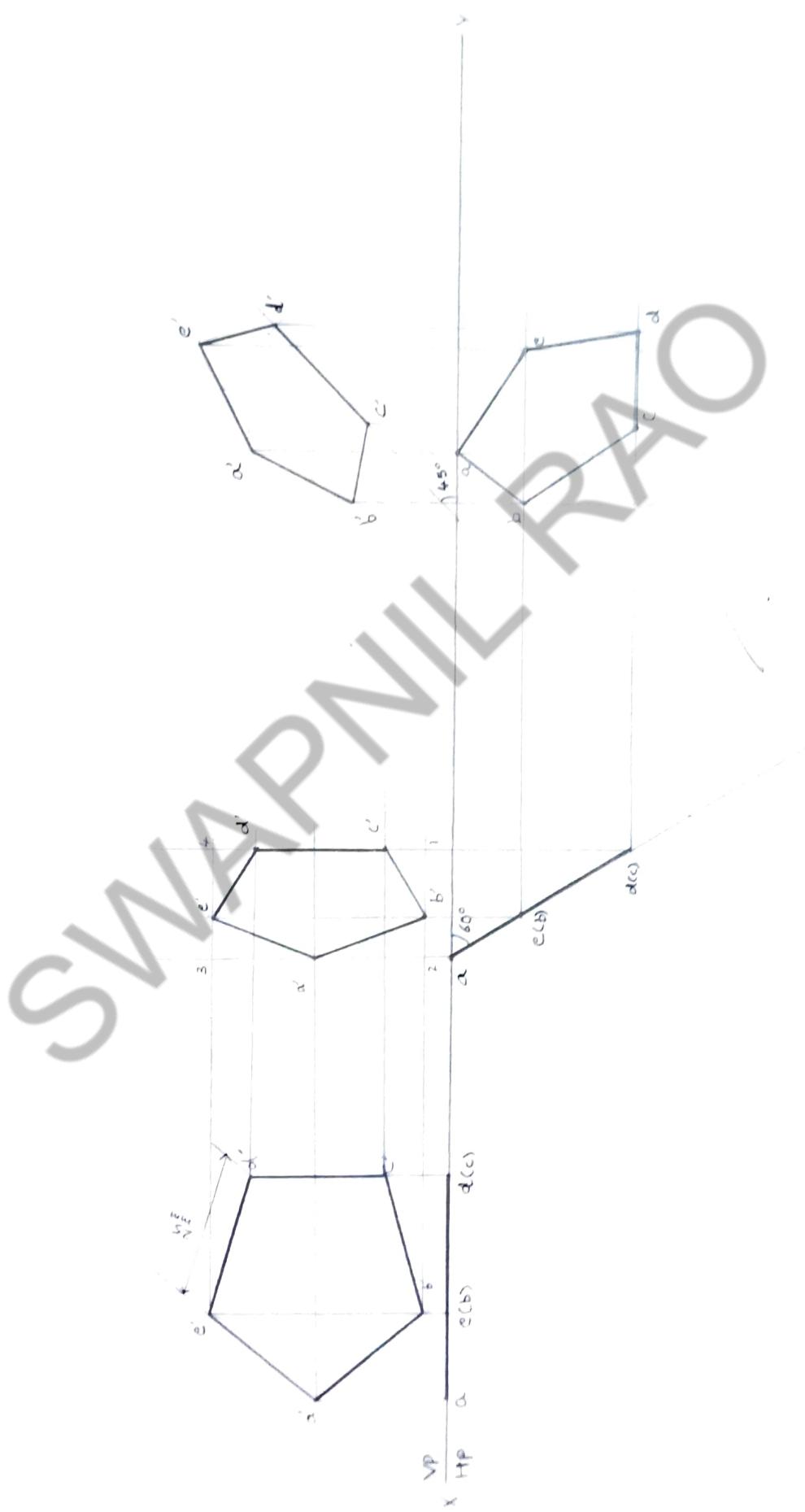
A pentagonal lamina having edges 25mm is placed on one of its corners in VP such that the surface makes an angle 30° with VP and perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 45° to HP. Draw the projections.

Ans:



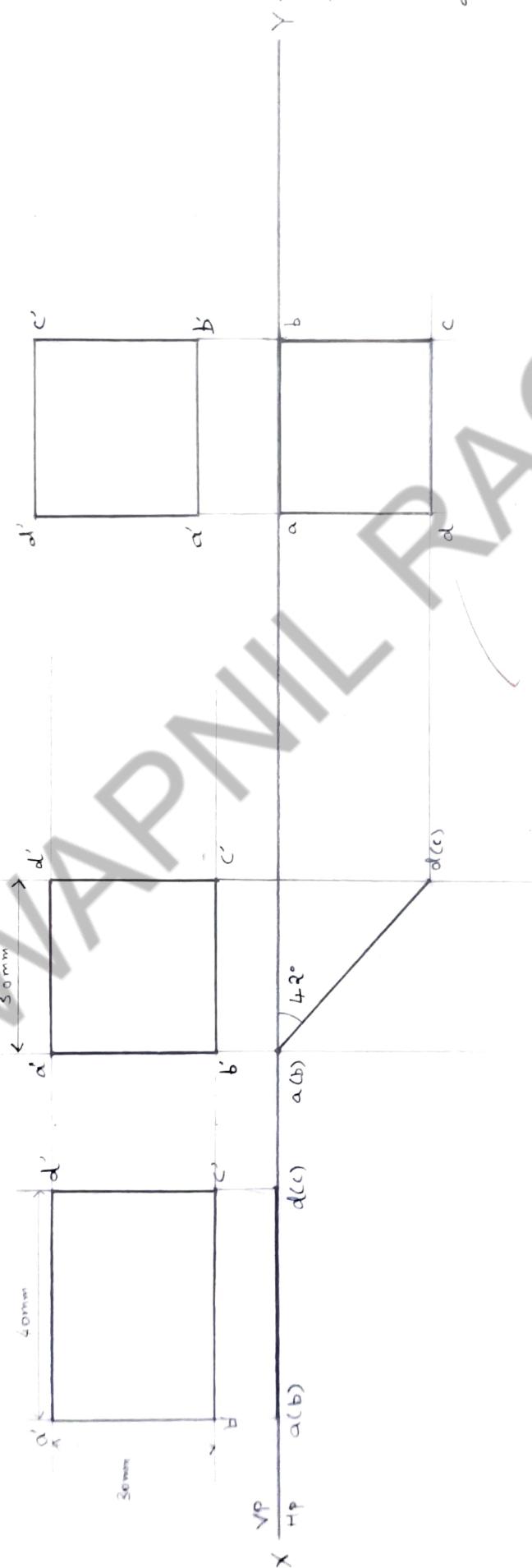
A pentagonal lamina of edge 25 mm is resting on VP with one of its sides in that the surface makes an angle of 60° with VP. The edge on which it rests is inclined at 45° to HP. Draw the projections.

Ans



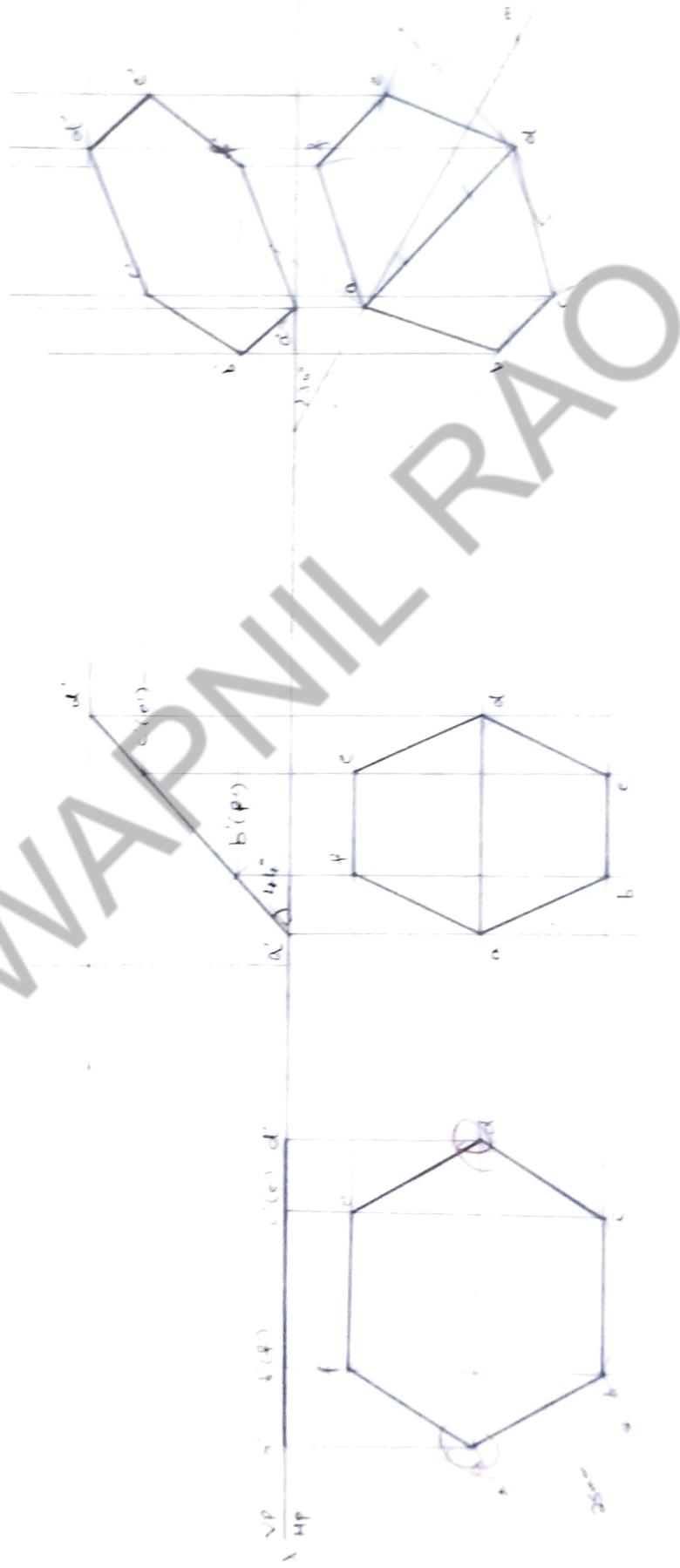
A mirror 30mm X 40mm is inclined to the wall such that its front view is a square of 30mm side. The longer sides of the mirror appear perpendicular to both HP and VP. Draw the projections of mirror below.

Ans



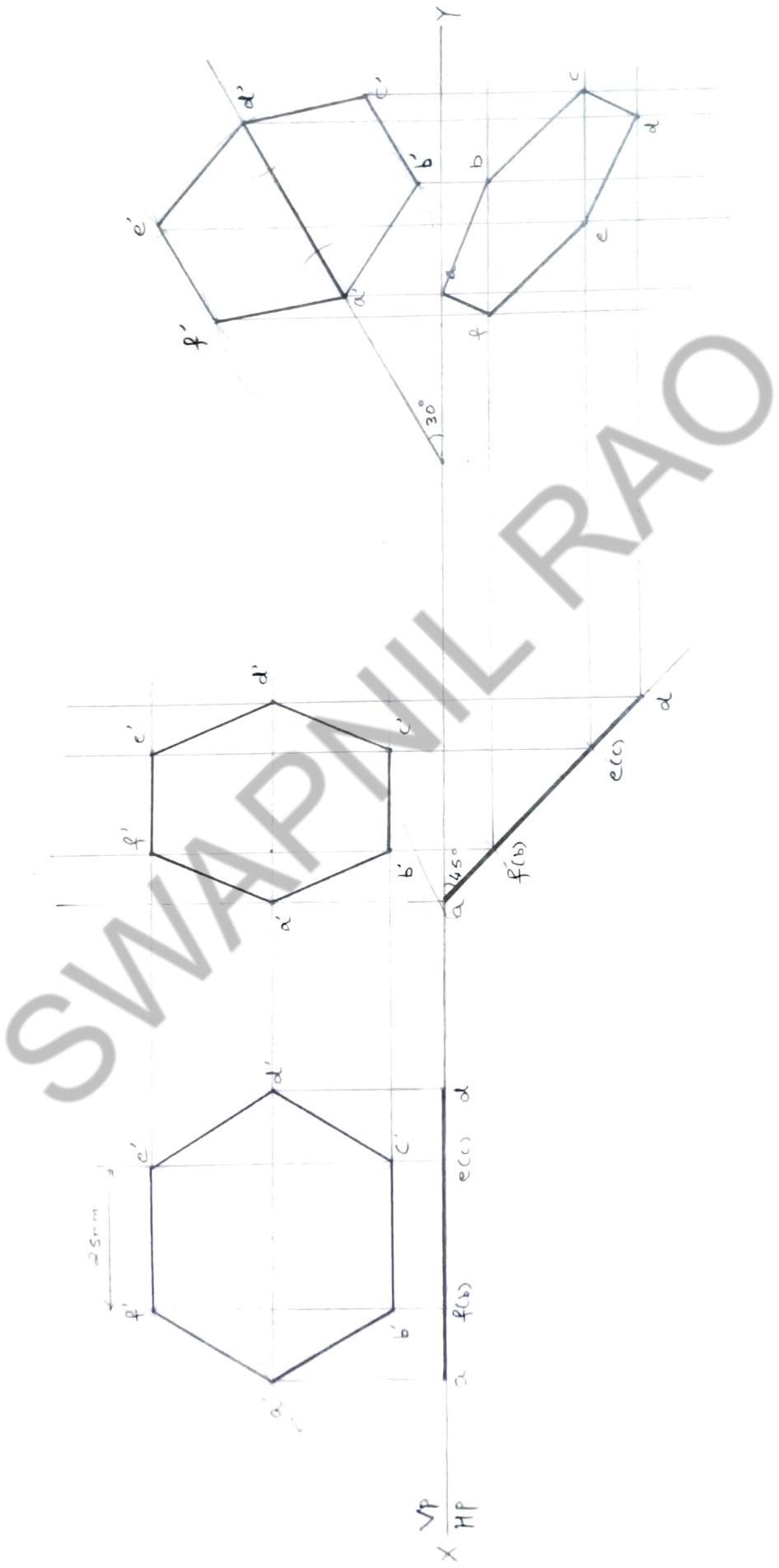
A hexagonal lamina of sides 25mm starts on one of its corner on HP. The other opposite to the corner on which it rests is 35mm above VP and the diagonal passing through the corner on which it rests is inclined at 30° to VP. Draw its projections.

Ans



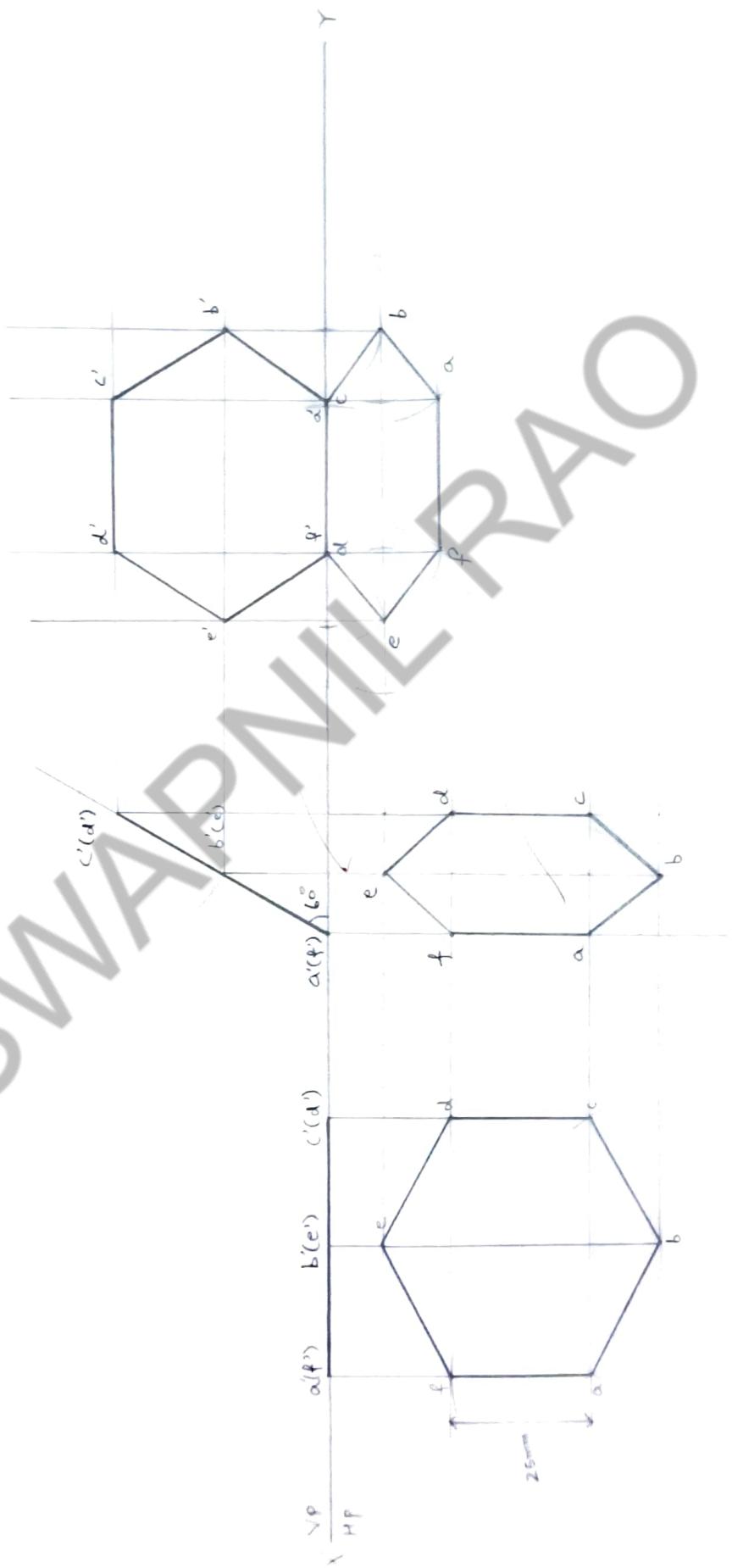
A hexagonal lamina of sides 25 mm rests on one of its corners on VP. The lamina makes 45° to VP and the diagonal passing through the corner on which it rests is inclined 30° to HP. Draw its projections.

Ans



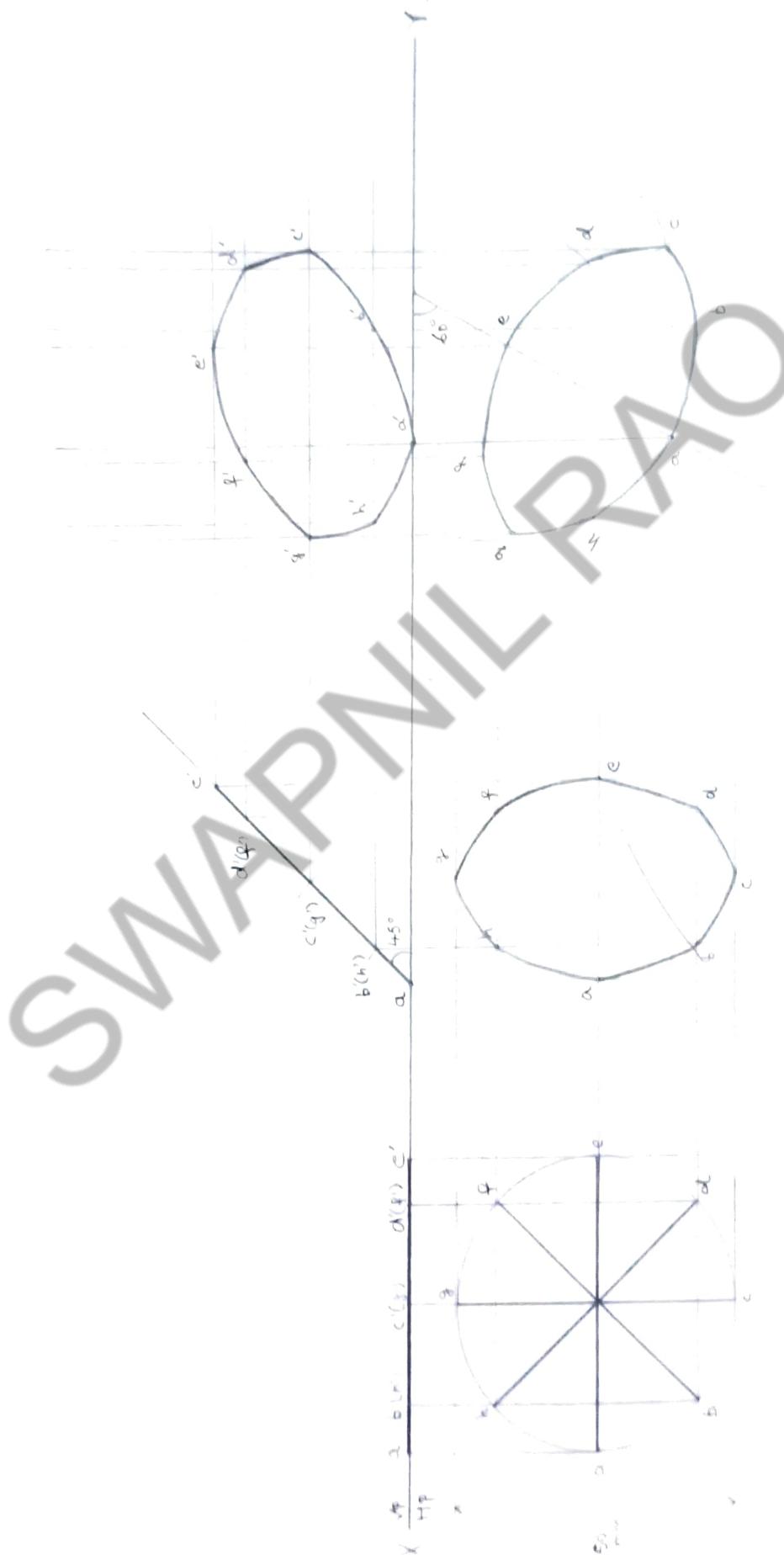
A regular hexagon lamina of sides 25mm is lying in such a way that one of its sides on HP while the side opposite to the side on which it rests is on VP. If the lamina 60° to HP, draw the projections.

Ans



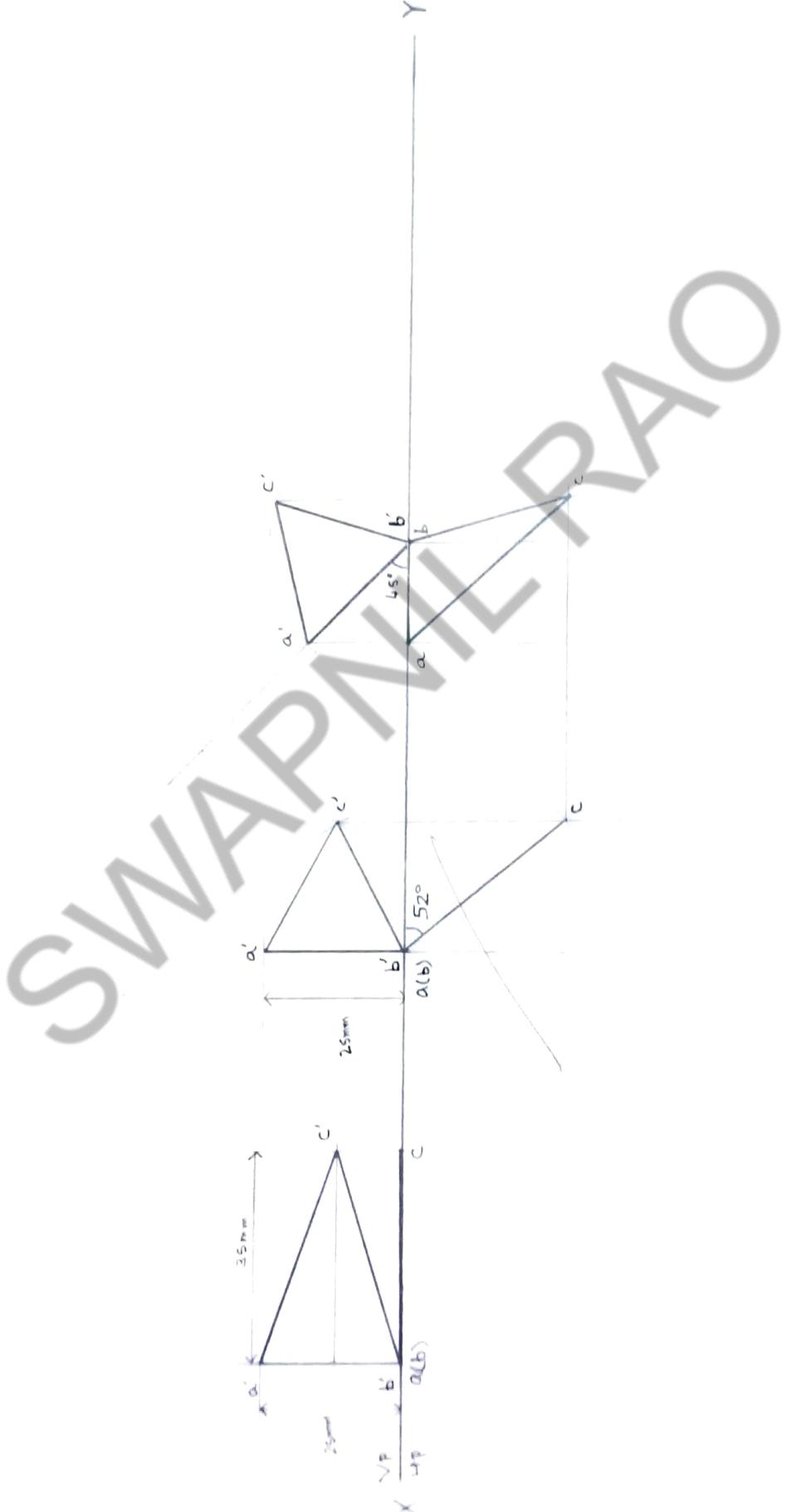
Show the projections of a circular plate of negligible thickness of 25 mm diameter resting on HP on a point A on the circumference, with its plane inclined at 45° to HP and top view of the diameter passing through the resting point makes 60° with VP.

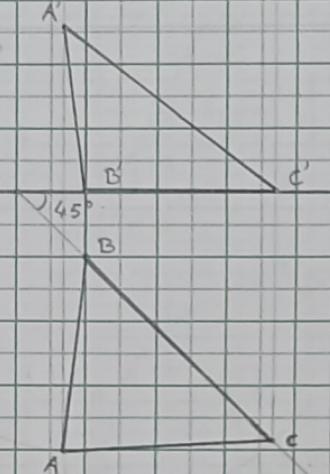
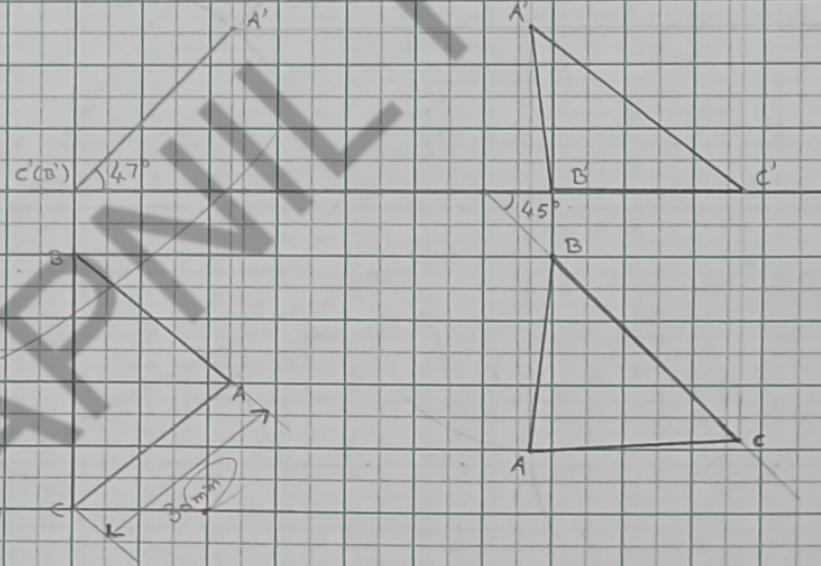
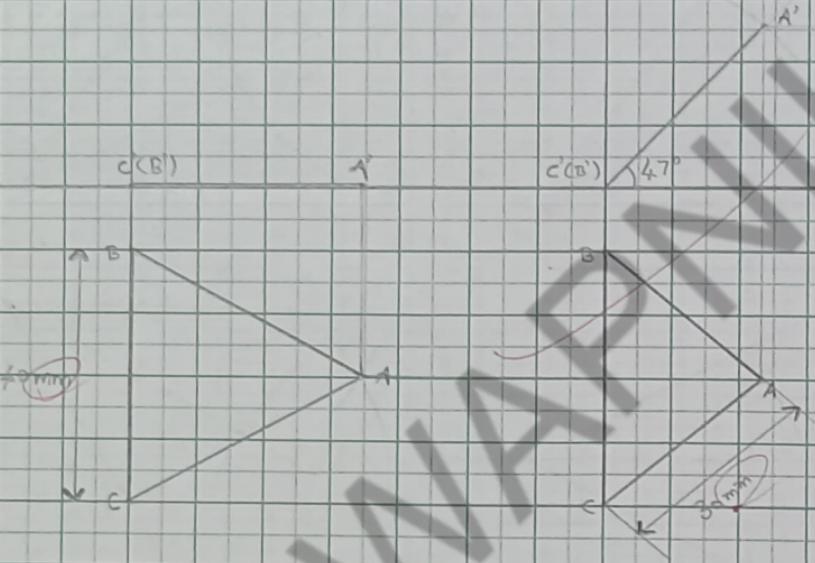
Ans



An isosceles Δ of negligible thickness has base 25mm long and altitude 35mm. It is so placed on HP such that in the front view it is seen as an equilateral Δ of 25mm sides with the side 11^{th} to VP inclined at 45° to HP. Draw the projections and determine the angle of plate with the reference plane.

Ans





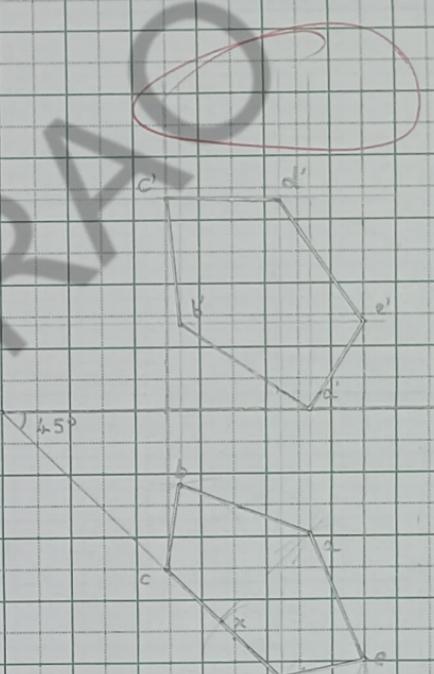
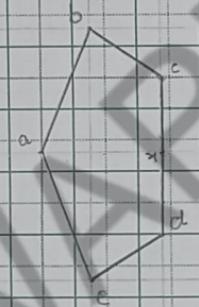
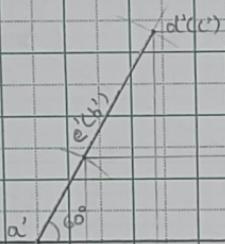
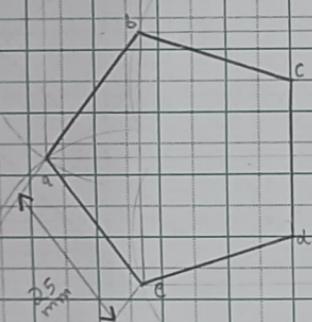
USN :

Signature:

X

VP a' e'(B') d'(C')

HP

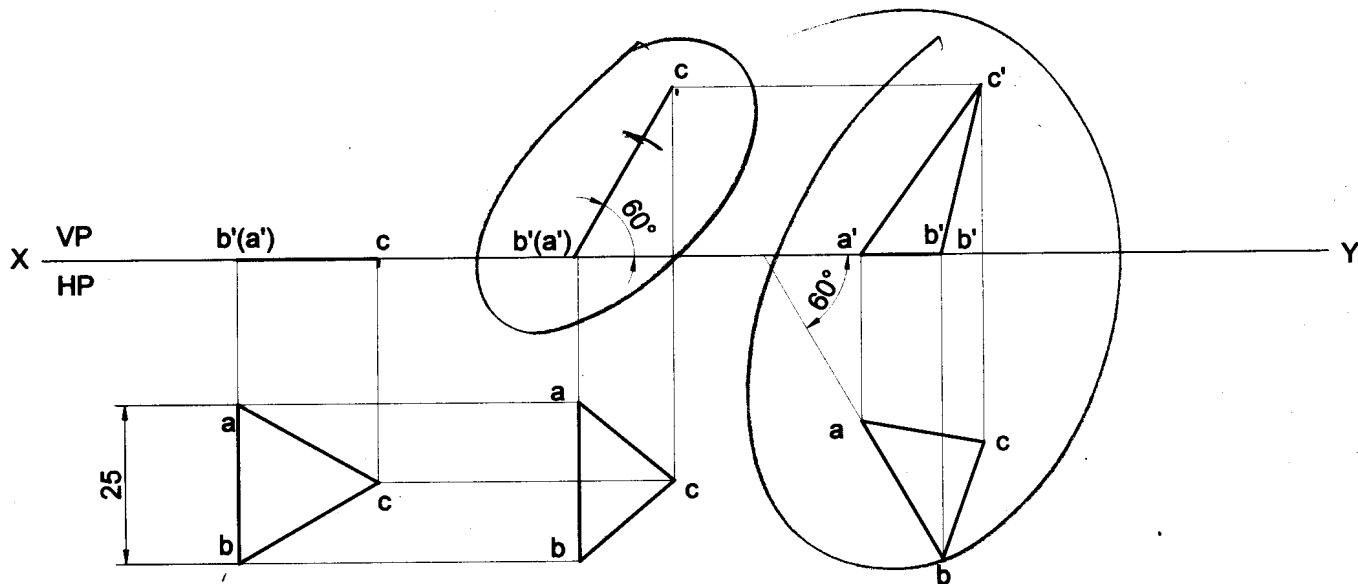


CHAPTER 3

PROJECTIONS OF PLANE SURFACES

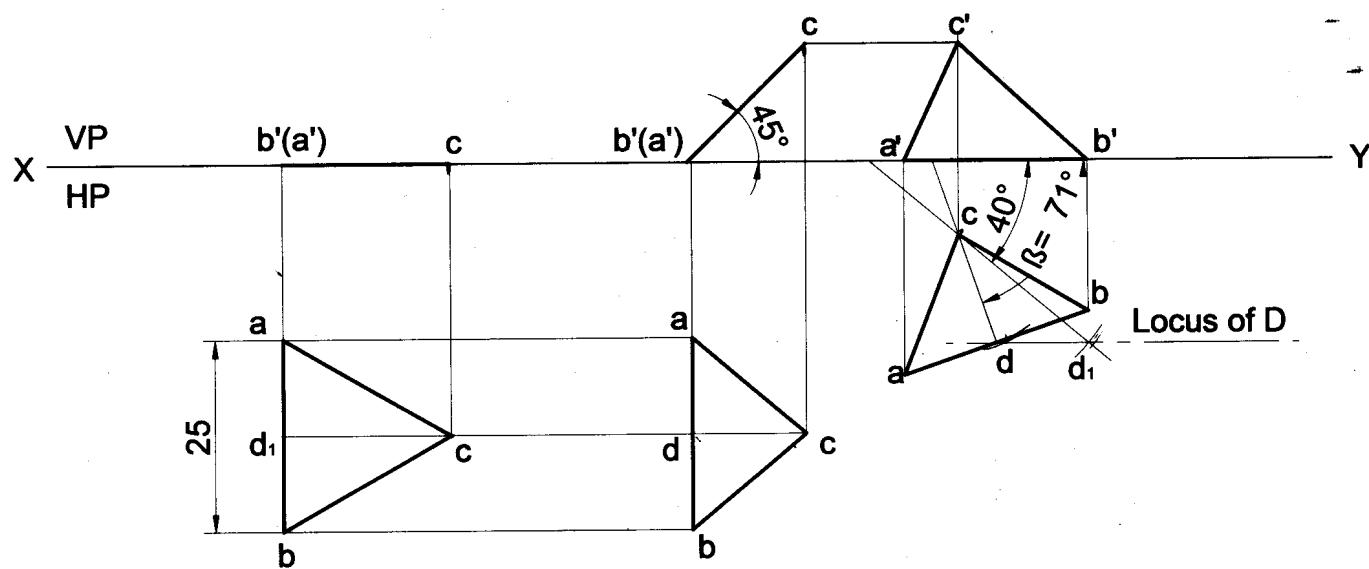
Problem 1 An equilateral triangular lamina of 25mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60° . The edge on which it rests is inclined to VP at 60° . Draw the projections.

Solution



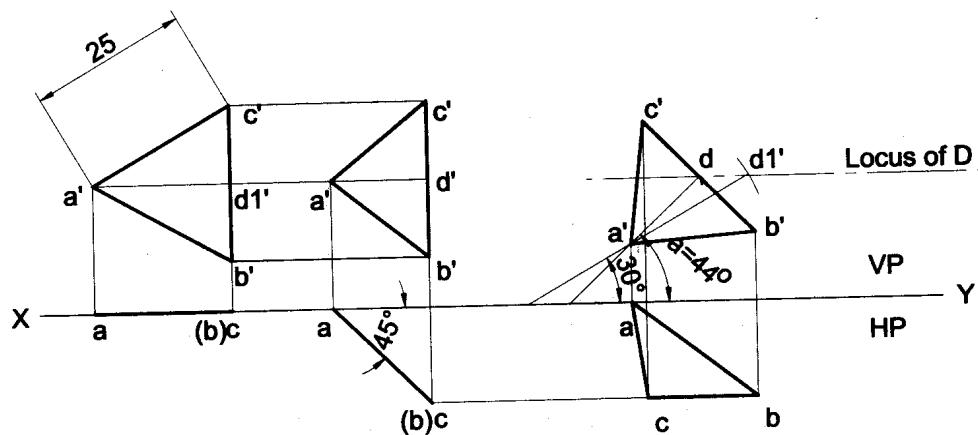
Problem 2 An equilateral triangular lamina of 25mm side lies on one of its sides on HP. The lamina makes 45° with HP and one of its medians is inclined at 40° to VP. Draw its projections.

Solution



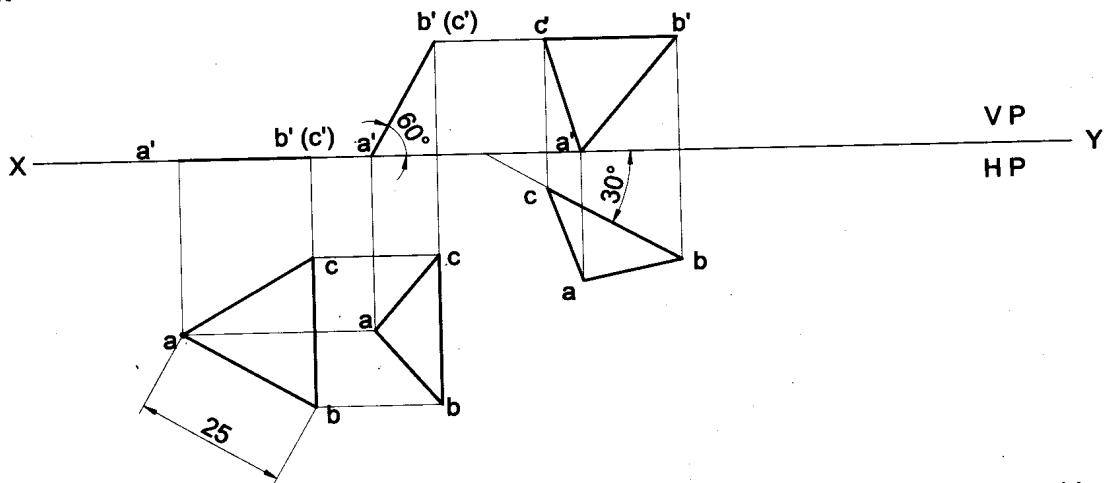
Problem 3 A triangular lamina of 25mm sides rests on one of its corners on VP such that the median passing through the corner on which it rests is inclined at 30° to HP and 45° to VP. Draw its projections.

Solution



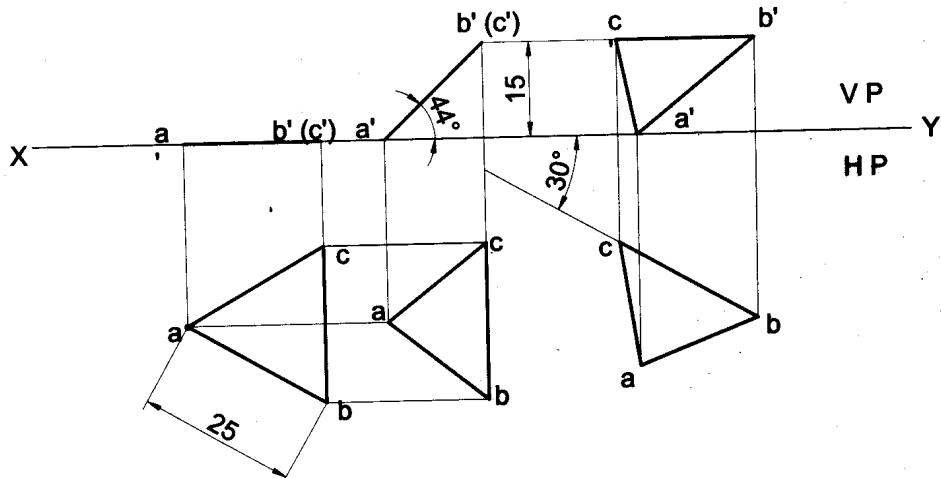
Problem 4 A triangular plane figure of sides 25mm is resting on HP with one of its corners, such that the surface of the lamina makes an angle of 60° with HP. If the side opposite to the corner on which the lamina rests makes an angle of 30° with VP, draw the top and front views in this position.

Solution



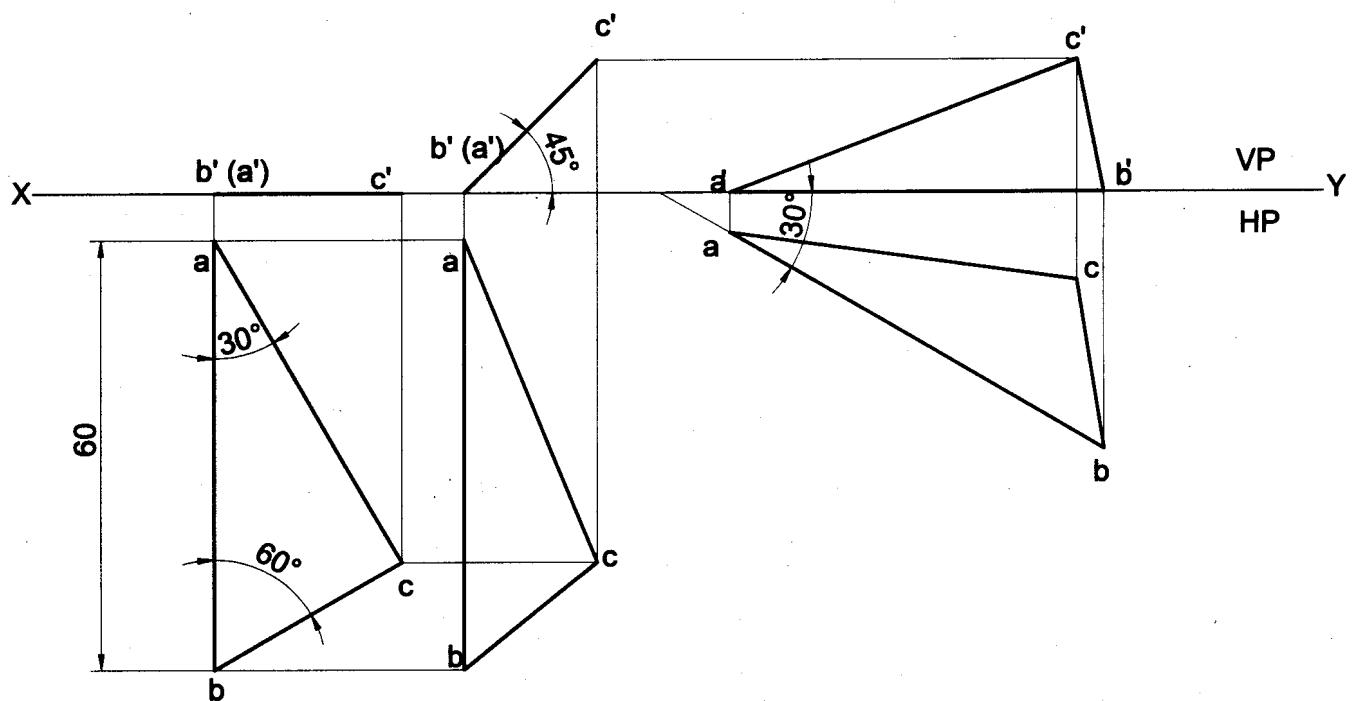
Problem 5 A triangular plane lamina of sides 25mm is resting on HP with one of its corners touching it, such that the side opposite to the corner on which it rests is 15mm above HP and makes an angle of 30° with VP. Draw the top and front views in this position. Also determine the inclination of the lamina to the reference plane.

Solution



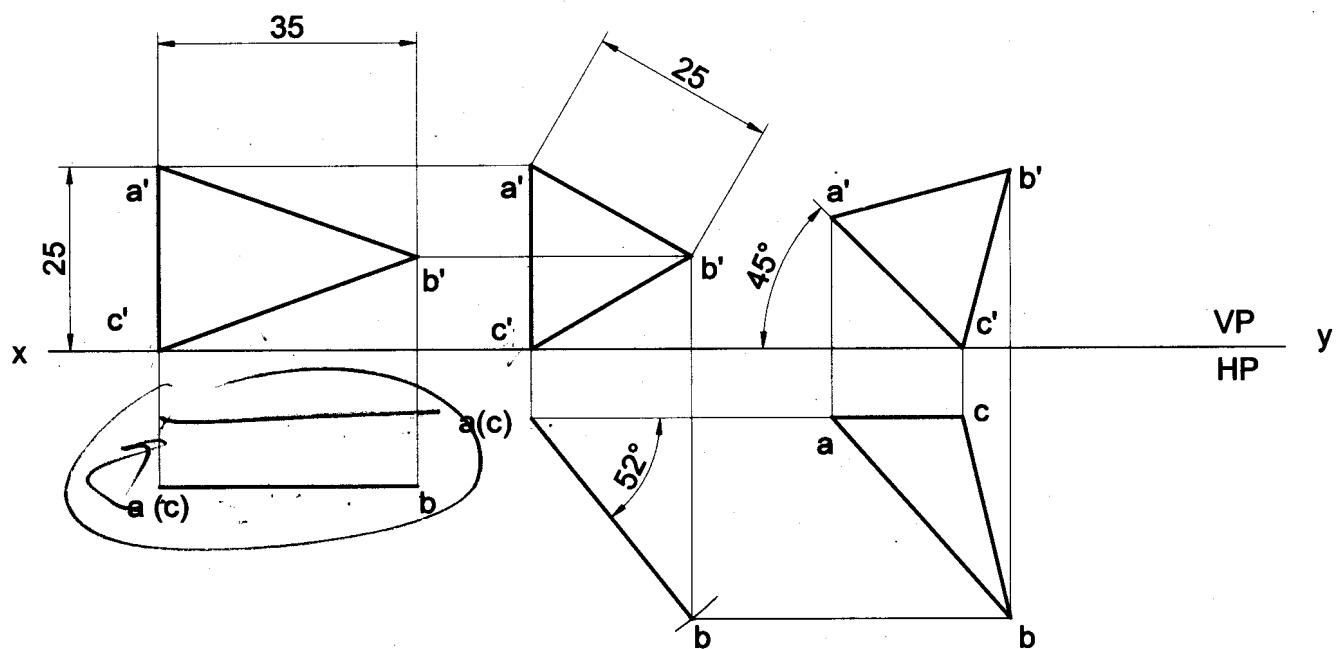
Problem 6 A 30° - 60° setsquare of 60mm longest side is so kept such that the longest side is in HP, making an angle of 30° with VP. The set square itself is inclined at 45° to HP. Draw the projections of the setsquare.

Solution



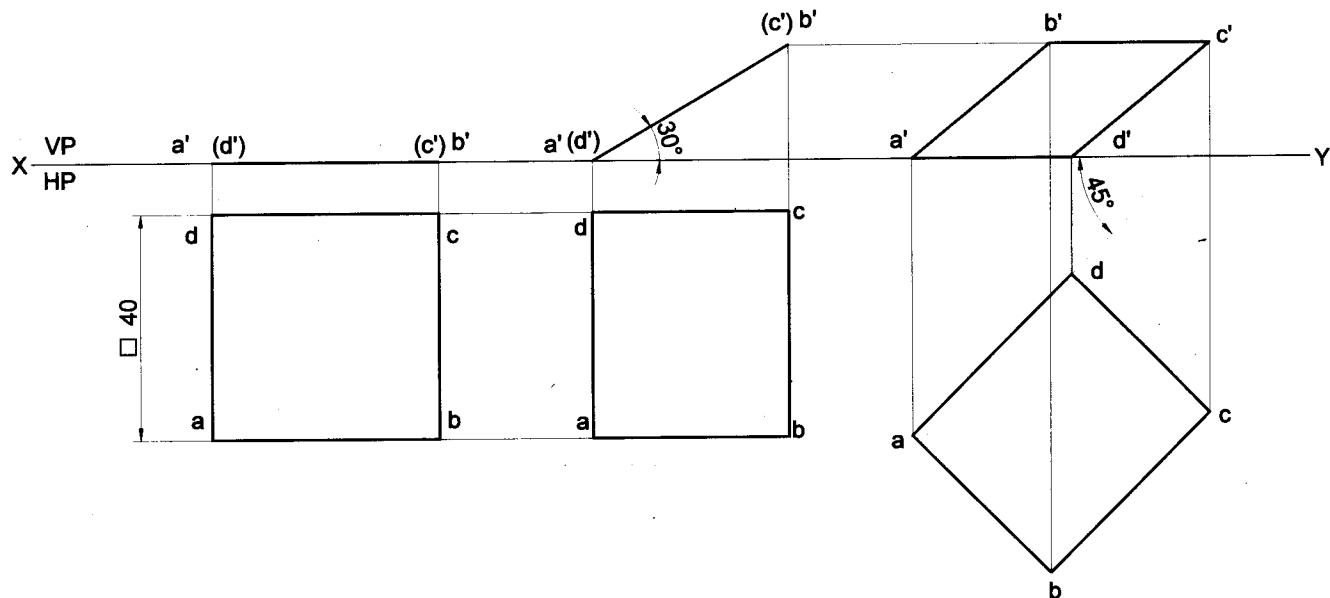
Problem 7 An isosceles triangular plate of negligible thickness has base 25mm long and altitude 35mm. It is so placed on HP such that in the front view it is seen as an equilateral triangle of 25mm sides with the side that is parallel to VP is inclined at 45° to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.

Solution



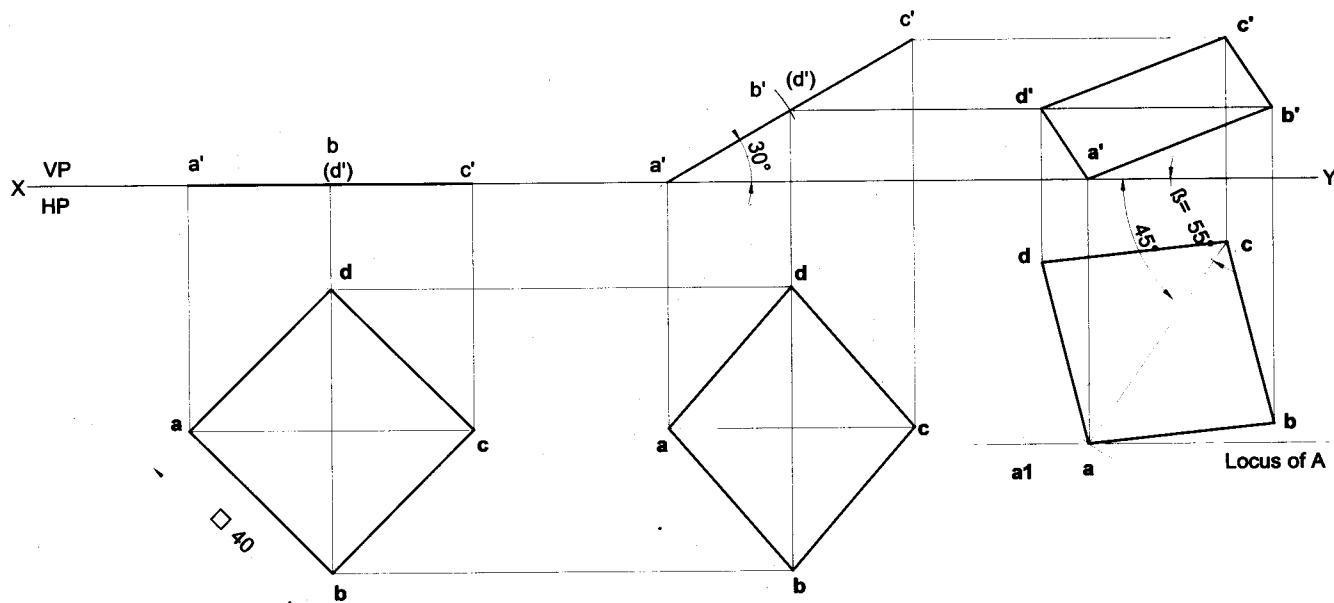
Problem 8 A square lamina of 40mm side rests on one of its sides on HP. The lamina makes 30° to HP and the side on which it rests makes 45° to VP. Draw its projections.

Solution



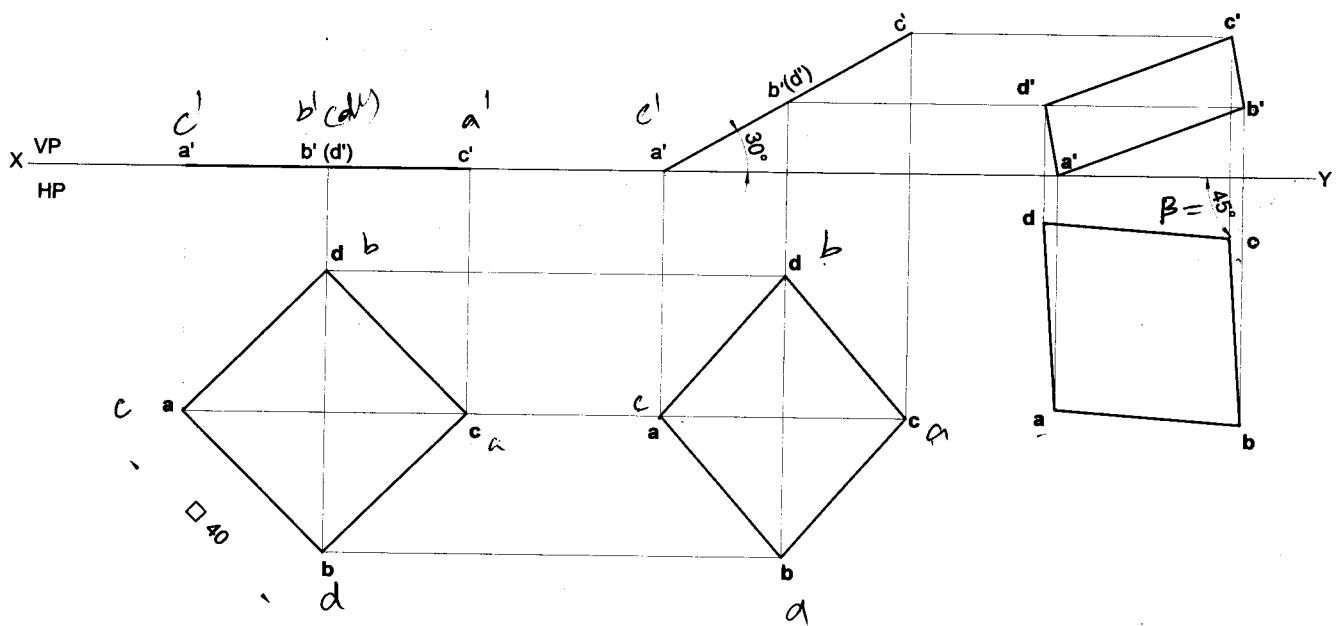
Problem 9 A square plate of 30mm sides rests on HP such that one of the diagonals is inclined at 30° to HP and 45° to VP. Draw its projections.

Solution



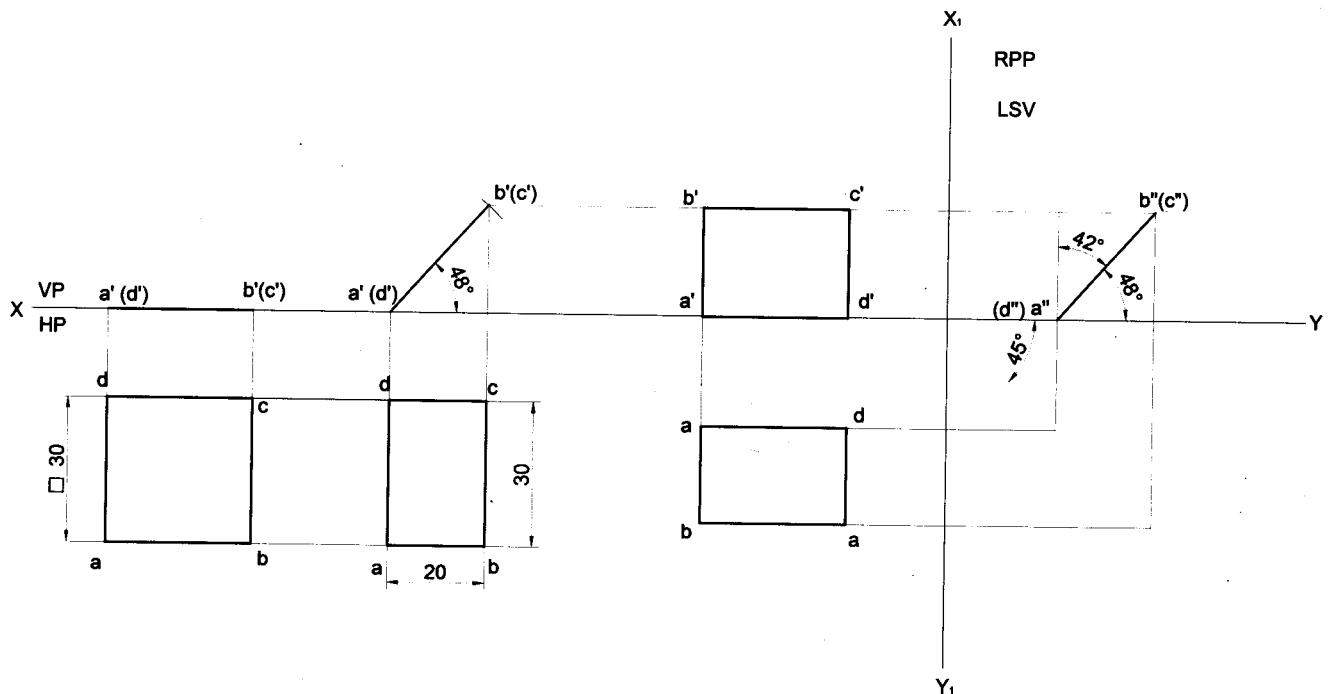
Problem 10 A square lamia ABCD of 40mm side rests on corner C such that the diagonal AC appears to be at 45° to VP. The two sides BC and CD containing the corner C make equal inclinations with HP. The surface of the lamina makes 30° with HP. Draw its top and front views.

Solution



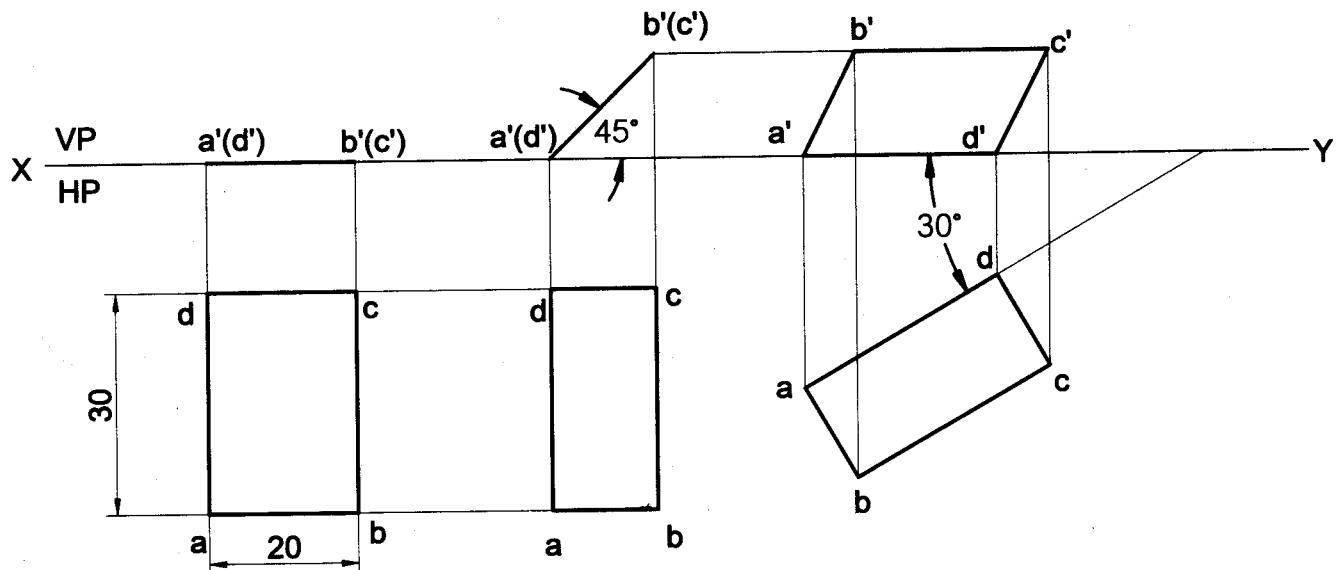
Problem 11 The top view of a square lamia of side 30mm is a rectangle of sides 30mm x 20mm with the longer side of the rectangle being parallel to both HP and VP. Draw the top and front views of the square lamina. What is the inclination of the surface of the lamina with HP and VP?

Solution



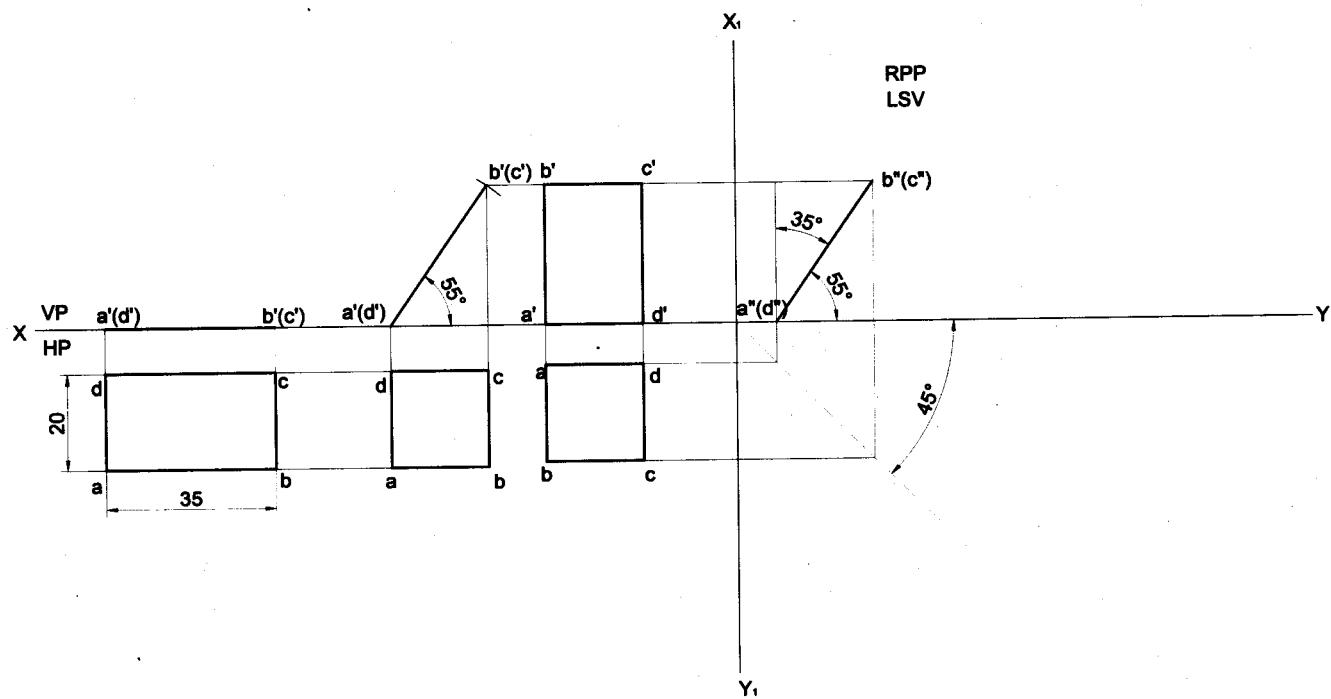
Problem 12 A rectangular lamina of sides 20mm x 30mm rests on HP on one of its longer edges. The lamina is tilted about the edge on which it rests till its plane surface is inclined to HP at 45° . The edge on which it rests is inclined at 30° to VP. Draw the projections of the lamina.

Solution



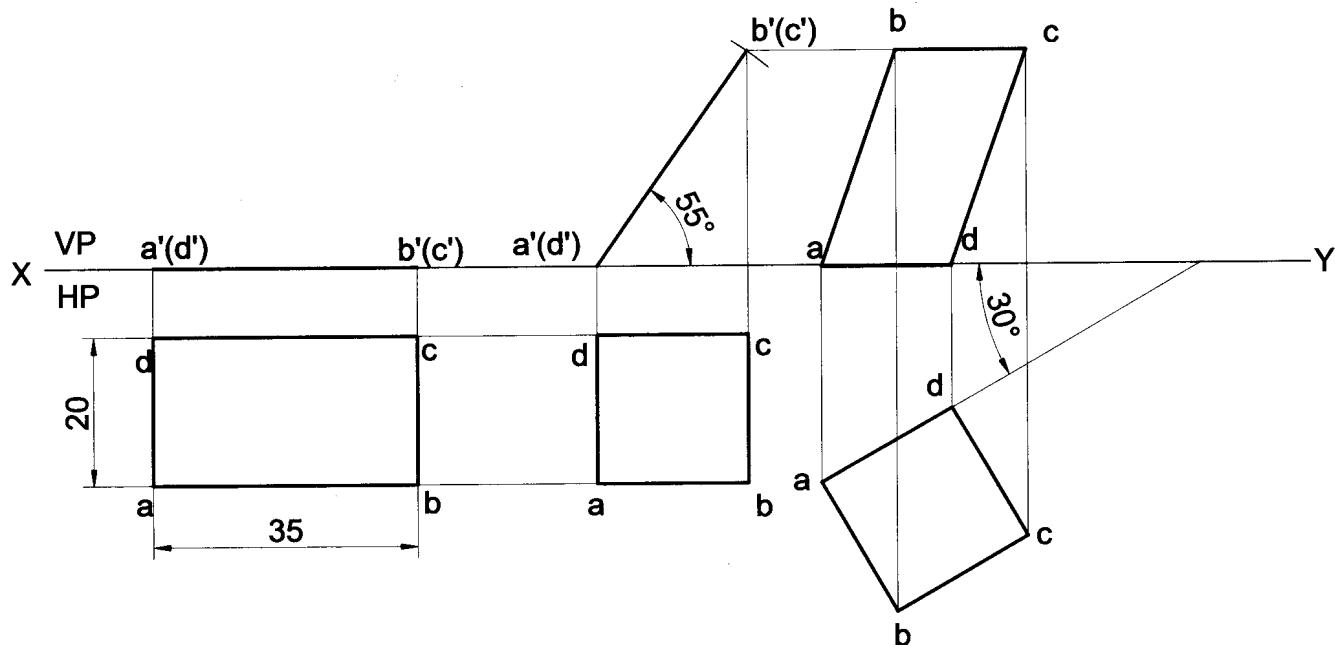
Problem 13 A rectangular lamina of 35mm x 20mm rests on HP on one of its shorter edges. The lamina is rotated about the edge on which it rests till it appears as a square in the top view. The edge on which the lamina rests being parallel to both HP and VP. Draw its projections and find its inclinations to HP and VP.

Solution



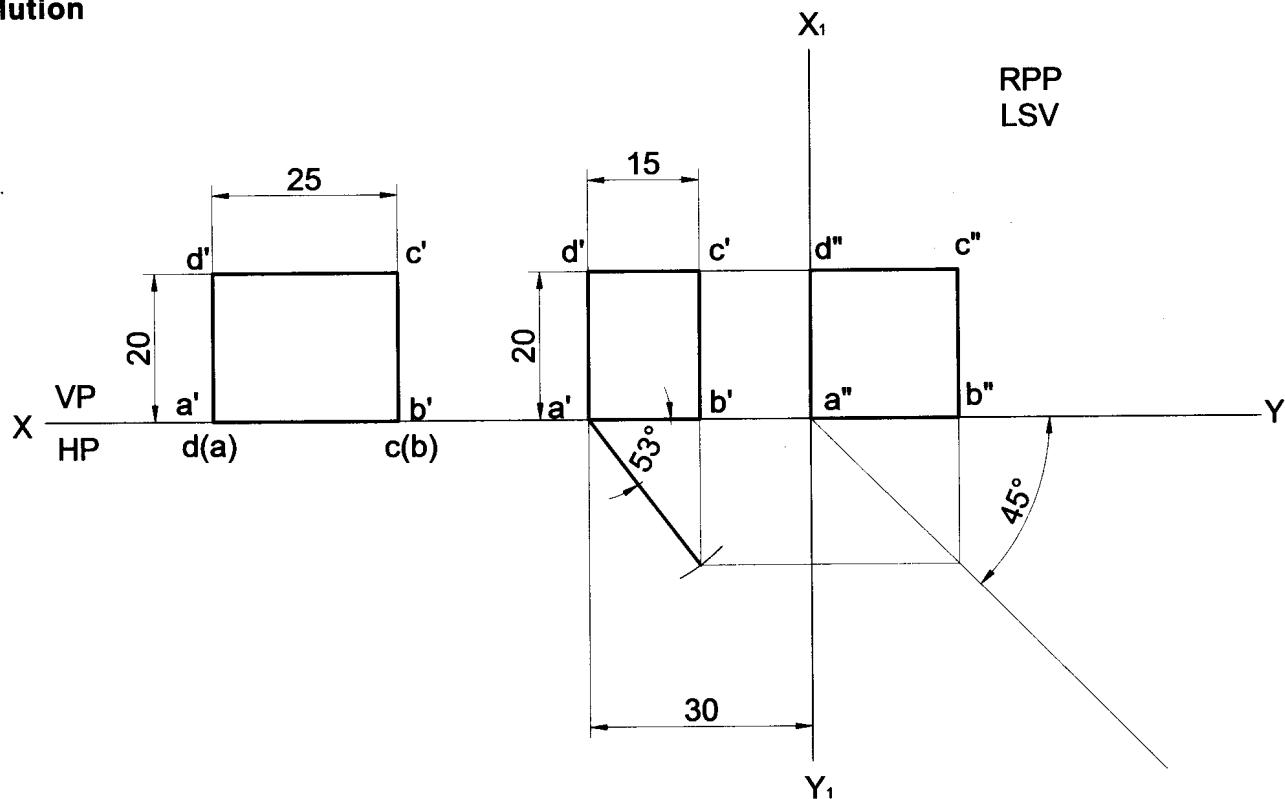
Problem 14 A rectangular lamina of 35mm x 20mm rests on HP on one of its shorter edges. The lamina is rotated about the edge on which it rests till it appears as a square in the top view. The edge on which the lamina rests is inclined 30° to VP. Draw its projections and find its inclination to HP.

Solution



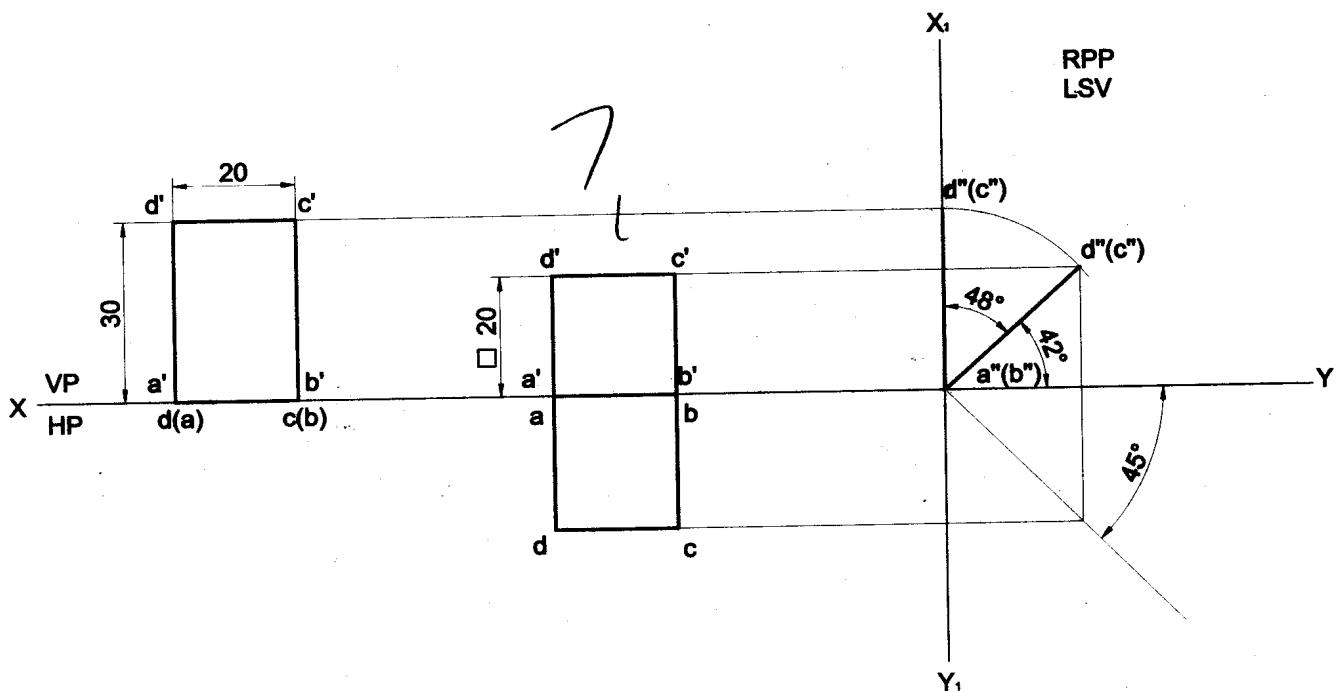
Problem 15 A rectangular lamina of sides 20mm x 25mm has an edge in HP and adjoining edge in VP, is tilted such that the front view appears as a rectangle of 20mm x 15mm. The edge, which is in VP, is 30mm from the right profile plane. (a) Draw the top view, front view and the left profile view in this position. (b) Find its inclinations with the corresponding principal planes.

Solution



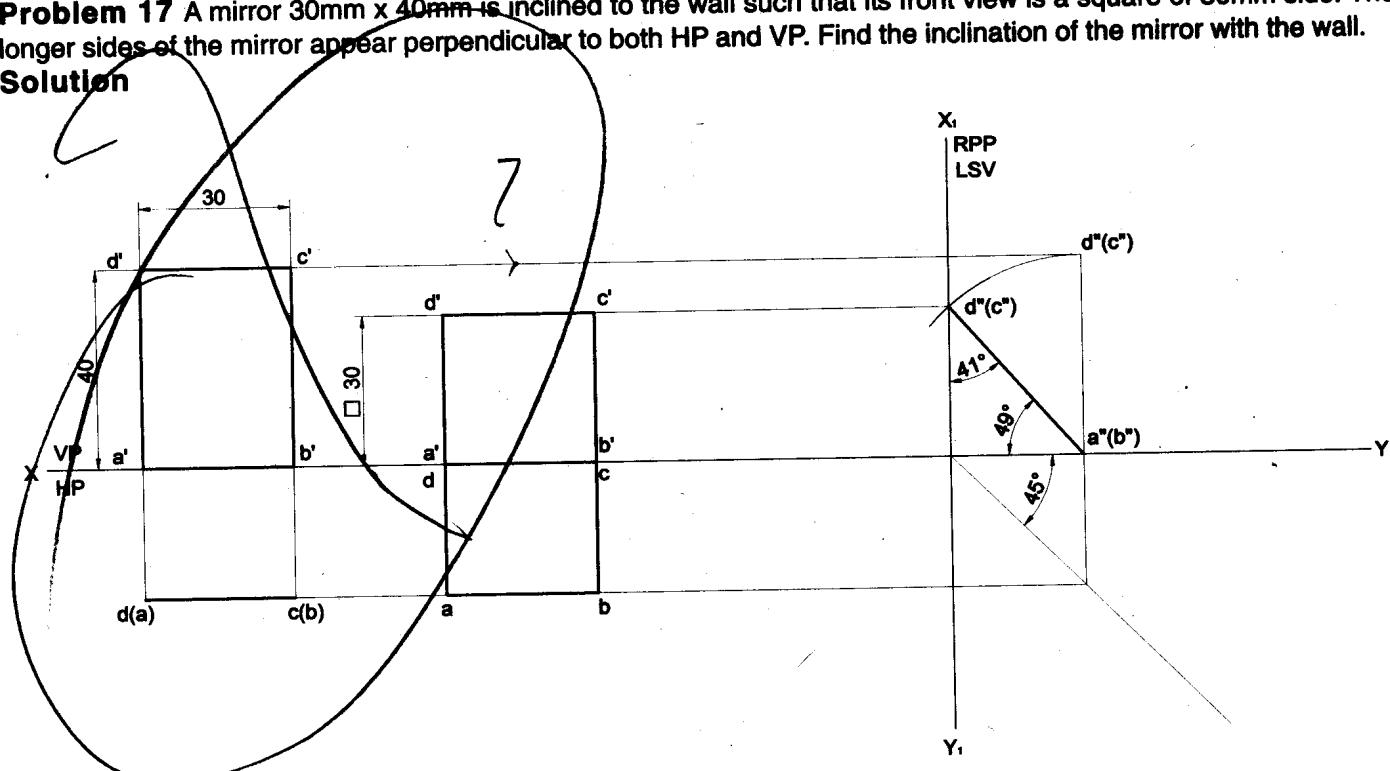
Problem 16 The front view of a rectangular lamina of sides 30mm x 20mm is square of 20mm sides. Draw the projections and determine the inclinations of the surface of the lamina with HP and VP.

Solution



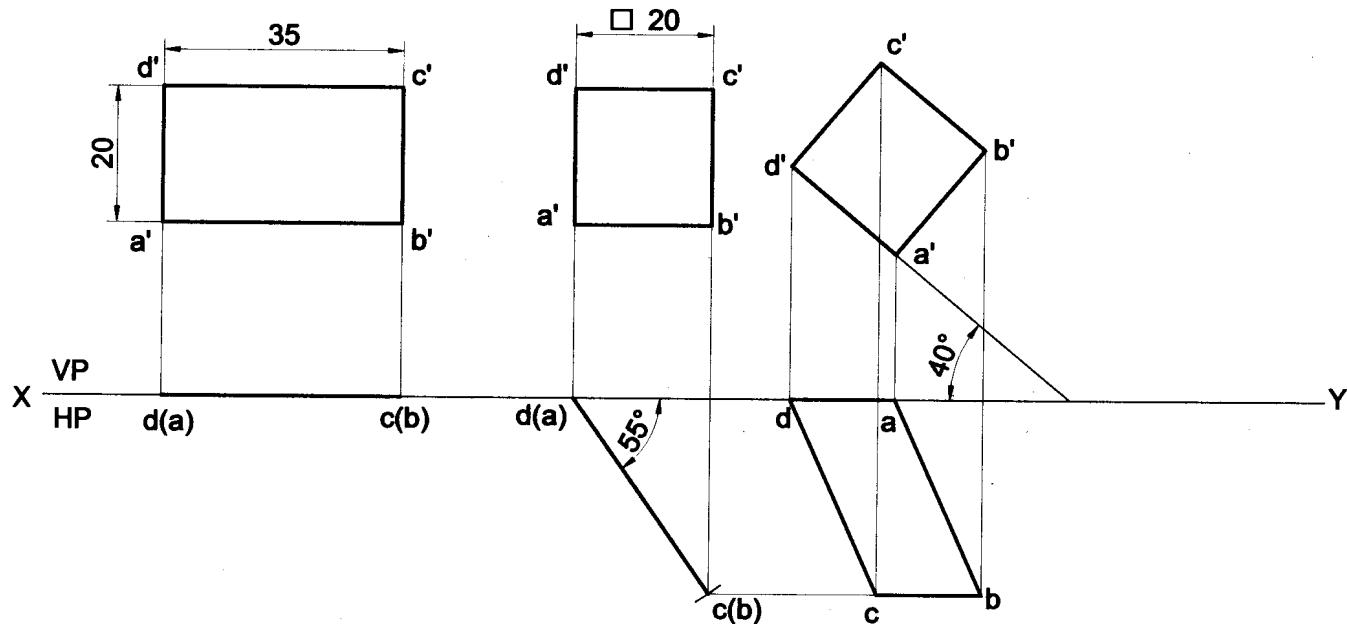
Problem 17 A mirror 30mm x 40mm is inclined to the wall such that its front view is a square of 30mm side. The longer sides of the mirror appear perpendicular to both HP and VP. Find the inclination of the mirror with the wall.

Solution



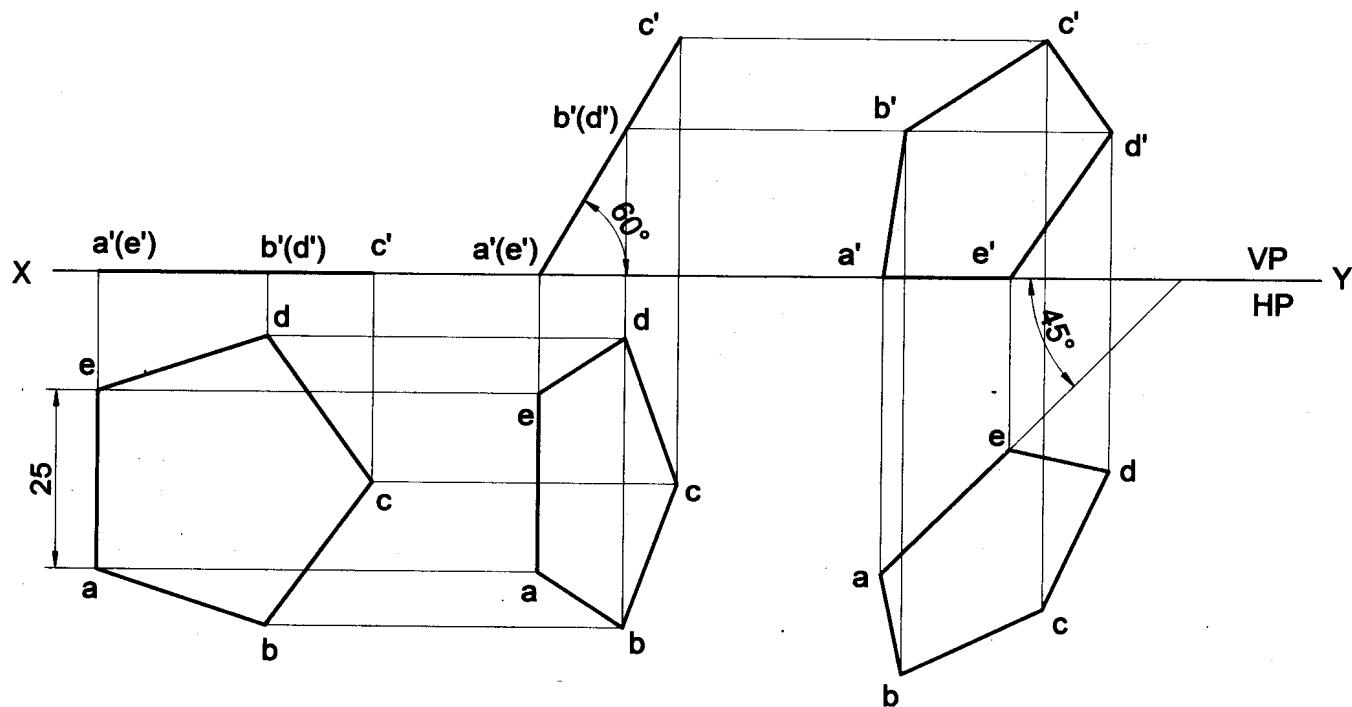
Problem 18 A rectangular plate of negligible thickness of size 35x20mm has one of its shorter edges in VP with that edge inclined at 40° to HP. Draw the top view if its front view is a square of side 20mm.

Solution



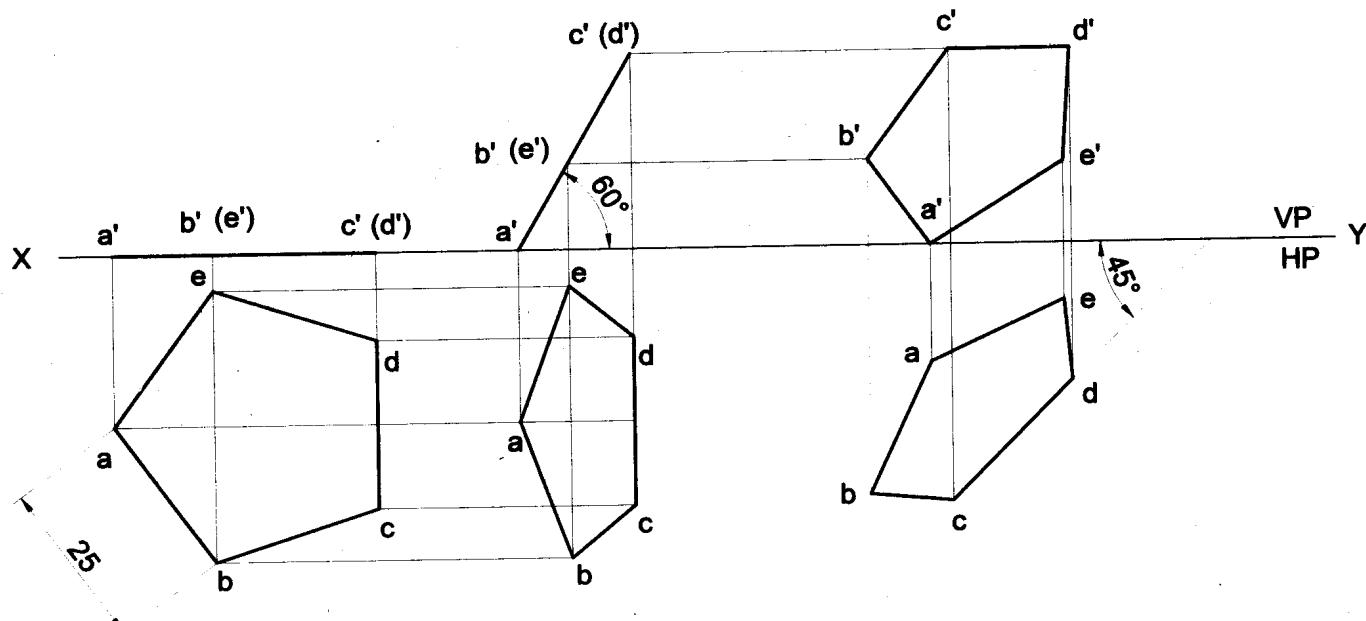
Problem 19 A pentagonal lamina of edges 25mm is resting on HP with one of its sides such that the surface makes an angle of 60° with HP. The edge on which it rests is inclined at 45° to VP. Draw its projections.

Solution



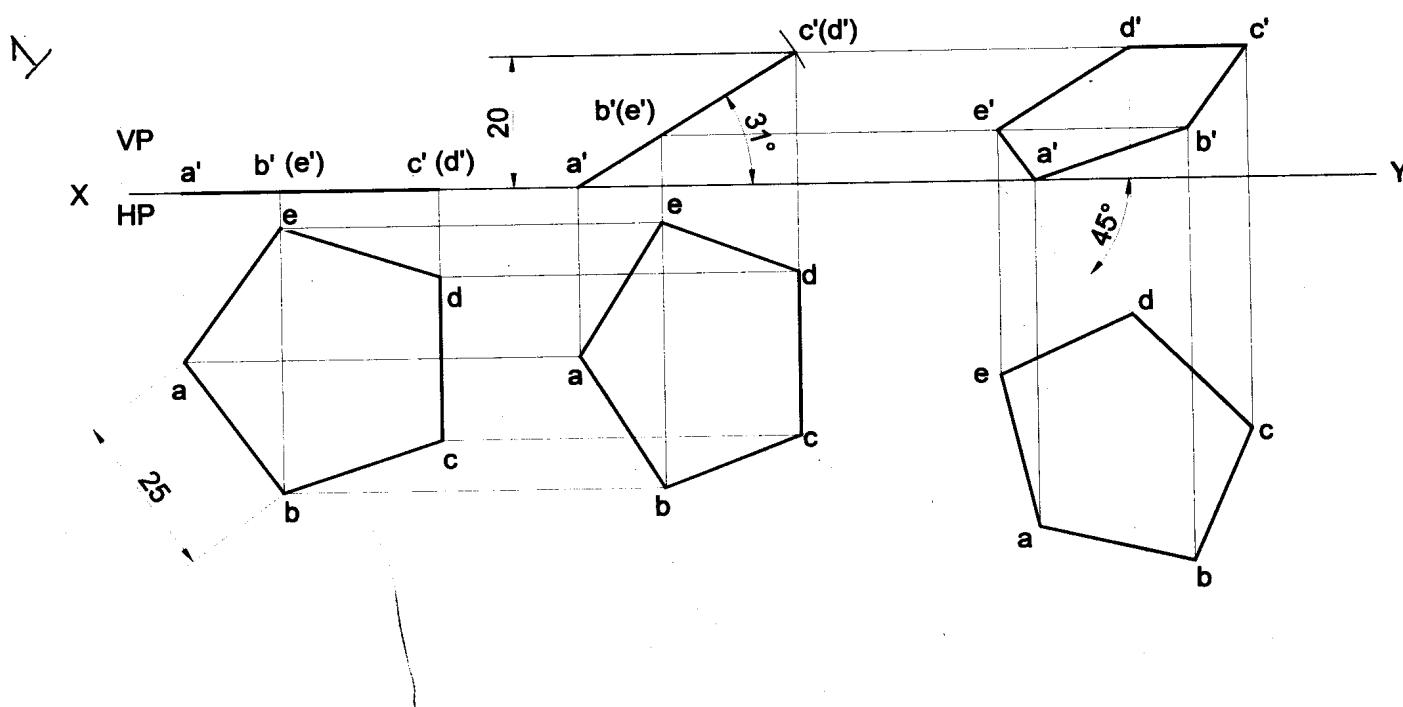
Problem 20 A pentagonal lamina of edges 25mm is resting on HP with one of its corners such that the plane surface makes an angle of 60° with HP. The two of the edges containing the corner on which the lamina rests make equal inclinations with HP. When the edge opposite to this corner make an angle of 45° with VP and nearer to the observer, draw the top and front views of the plane lamina in this position.

Solution



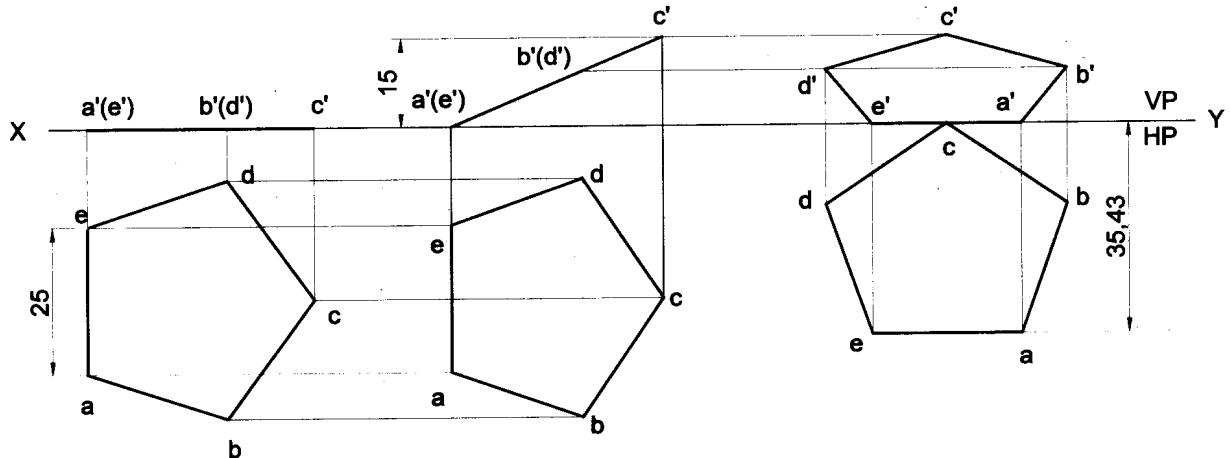
Problem 21 A pentagonal lamina of edges 25mm is resting on HP with one of its corners such that the edge opposite to this corner is 20mm above HP & makes an angle of 45° with VP. Draw the top and front views of the plane lamina in this position. Determine the inclination of the lamina with HP.

Solution



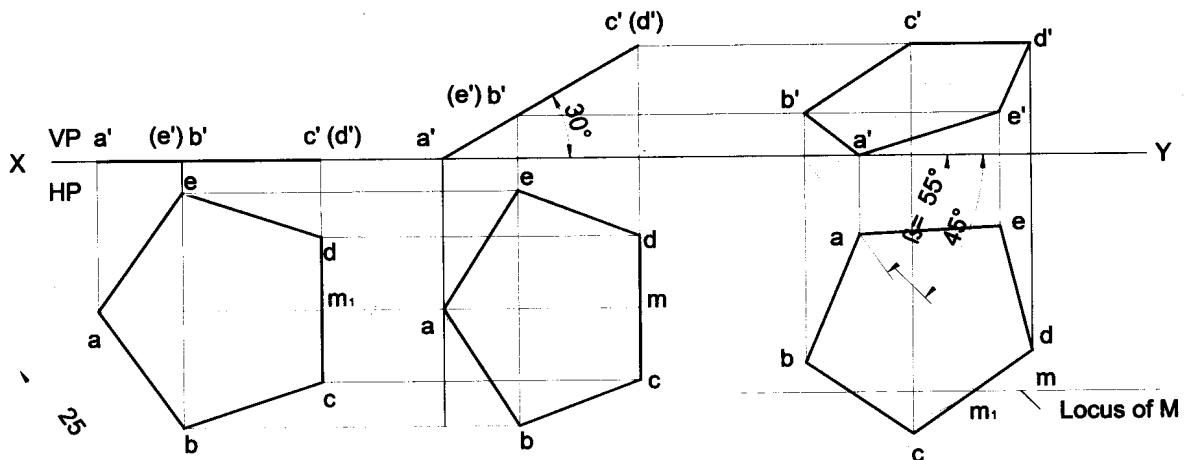
Problem 22 A pentagonal lamina of sides 25mm is resting on one of its edges on HP with the corner opposite to that edge touching VP. This edge is parallel to VP and the corner, which touches VP, is at a height of 15mm above HP. Draw the projections of the lamina and determine the inclinations of the lamina with HP and VP and the distance at which the parallel edge lies from VP.

Solution



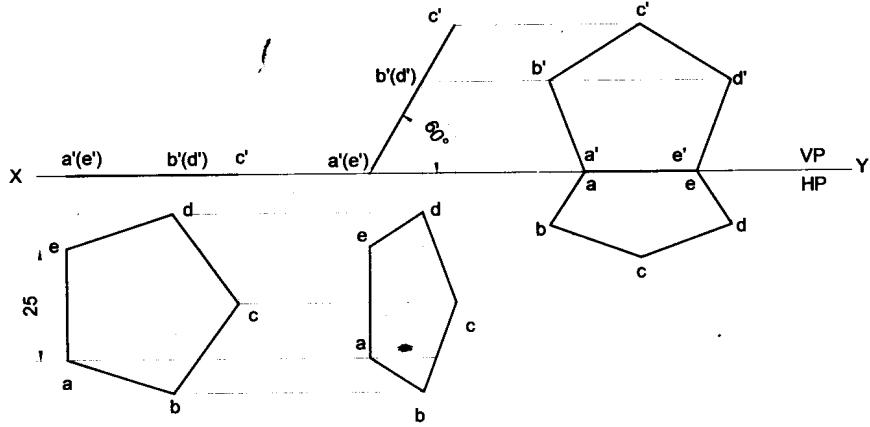
Problem 23 A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30° to HP and 45° VP. Draw the top and front views of the lamina.

Solution



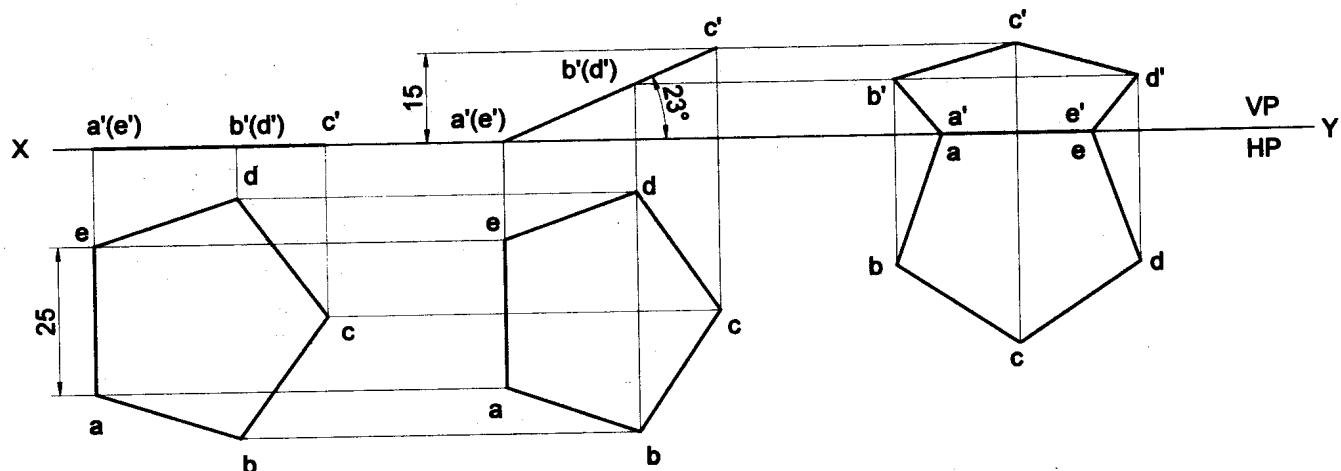
Problem 24 A pentagonal lamina of sides 25mm is having a side both on HP and VP. The corner opposite to the side on which it rests is 15mm above HP. Draw the top and front views of the lamina.

Solution



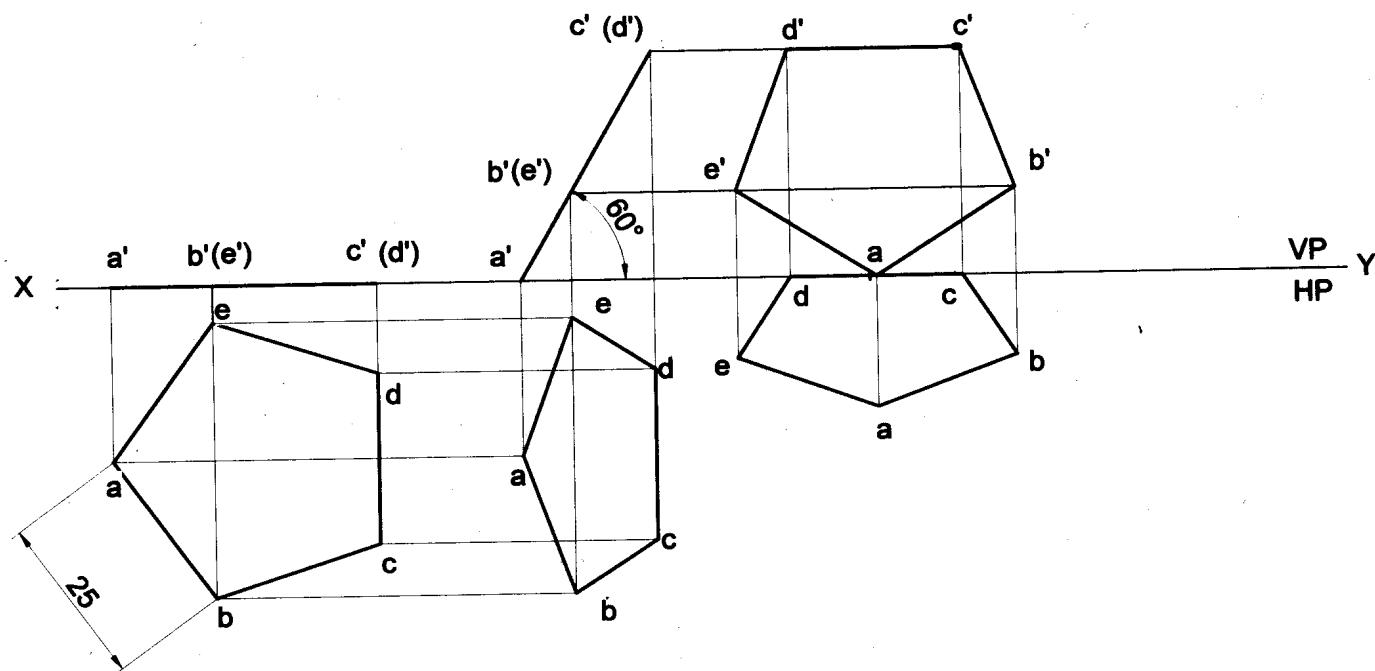
Problem 25 A pentagonal lamina of sides 25mm is having a side both on HP and VP. The surface of the lamina is inclined at an angle of 60° with HP. Draw the top and front views of the lamina.

Solution



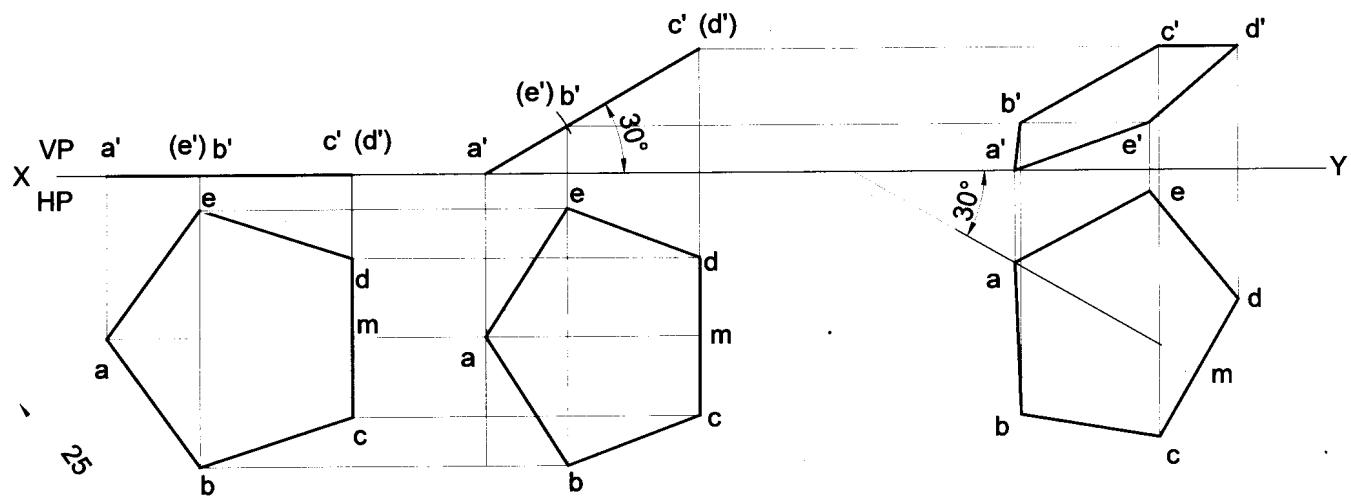
Problem 26 A regular pentagonal lamina of 25mm side is resting on one of its corners on HP while the side opposite to this corner touches VP. If the lamina makes an angle of 60° with HP and 30° with VP, draw the projections of the lamina.

Solution



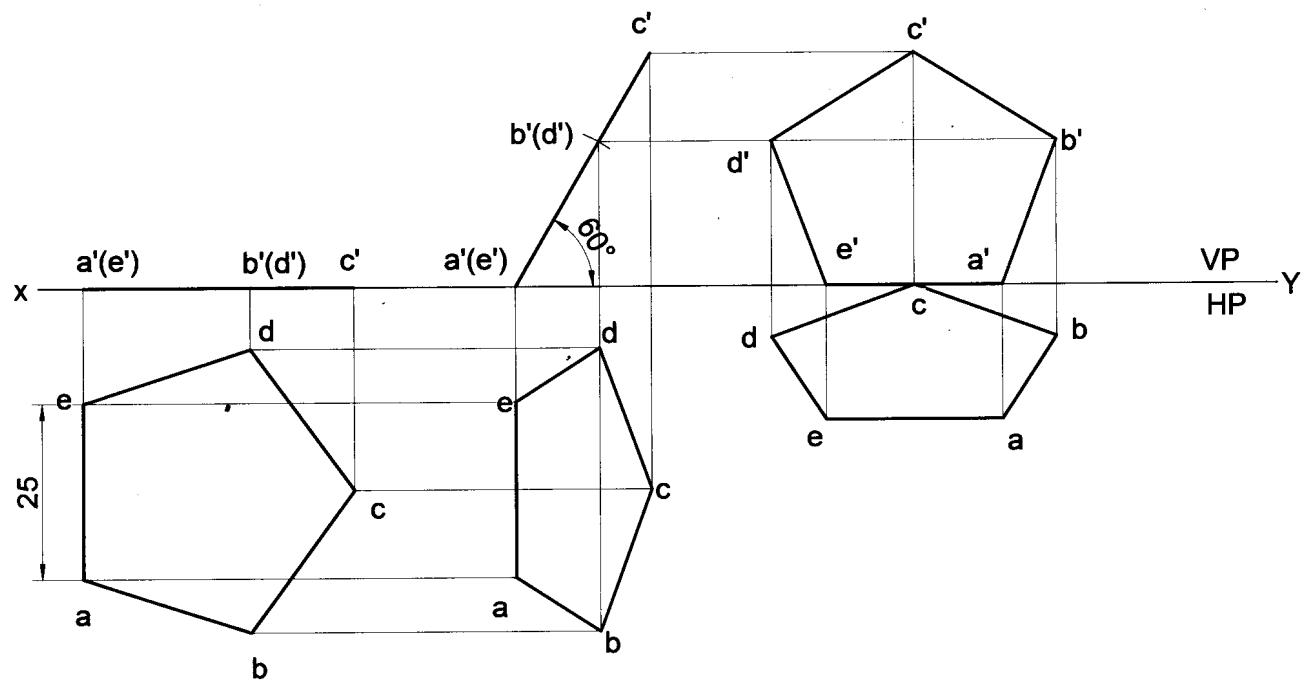
Problem 27 A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the surface makes an angle 30° with HP and perpendicular bisector of the edge passing through the corner on which the lamina rests appears to be inclined at 30° to VP. Draw the top and front views of the lamina.

Solution



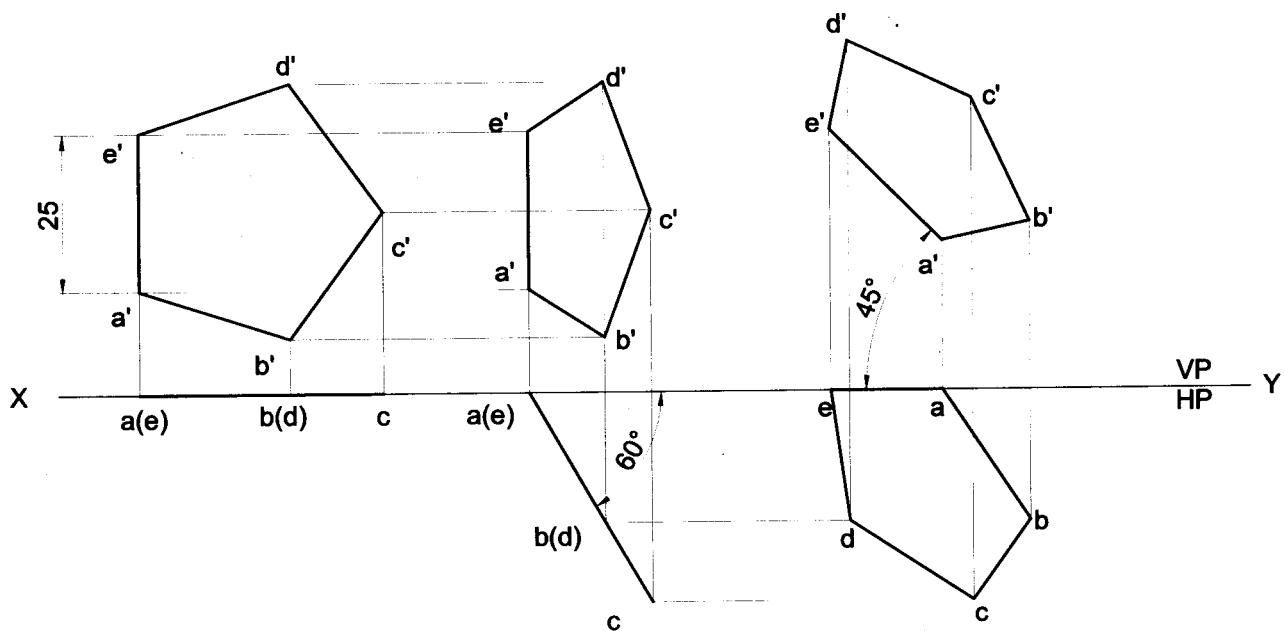
Problem 28 A regular pentagonal lamina of 25mm side is resting on one of its sides on HP while the corner opposite to this side touches VP. If the lamina makes an angle of 60° with HP and 30° with VP, draw the projections of the lamina.

Solution



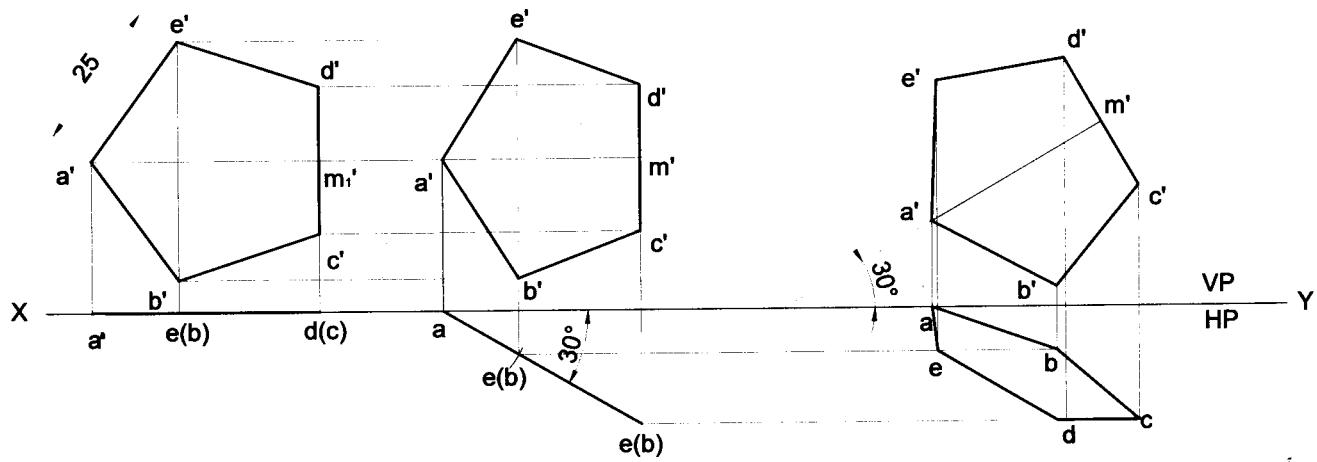
Problem 29 A pentagonal lamina of edges 25mm is resting on VP with one of its sides such that the surface makes an angle of 60° with VP. The edge on which it rests is inclined at 45° to HP. Draw its projections.

Solution



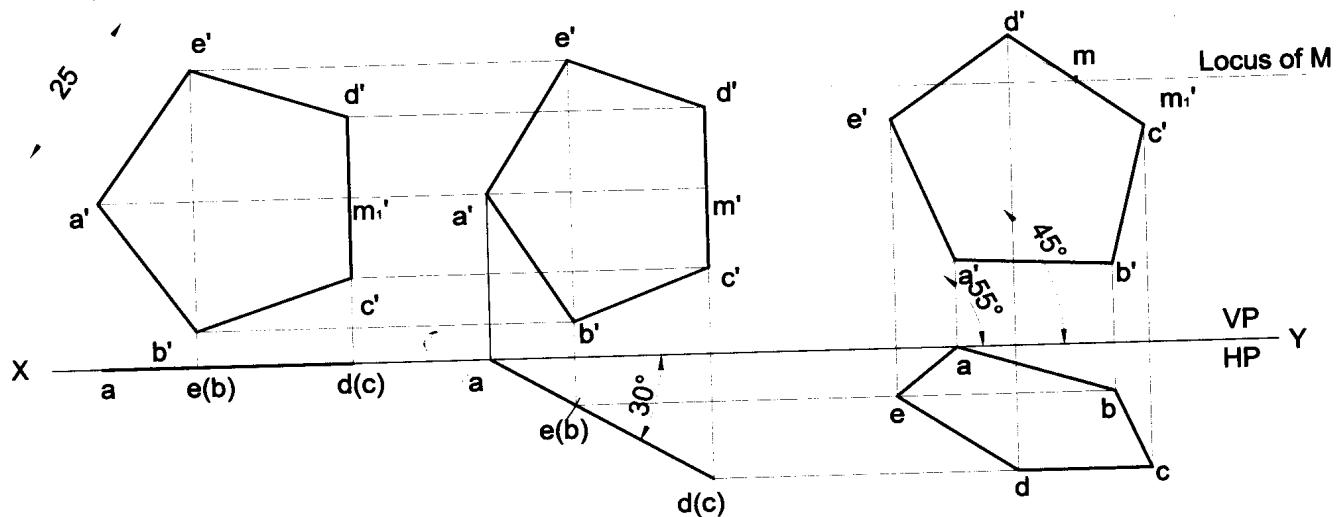
Problem 30 A pentagonal lamina having edges 25mm is placed on one of its corners on VP such that the surface makes an angle 30° with VP and perpendicular bisector of the edge passing through the corner on which the lamina rests appears to be inclined at 30° to HP. Draw the top and front views of the lamina.

Solution



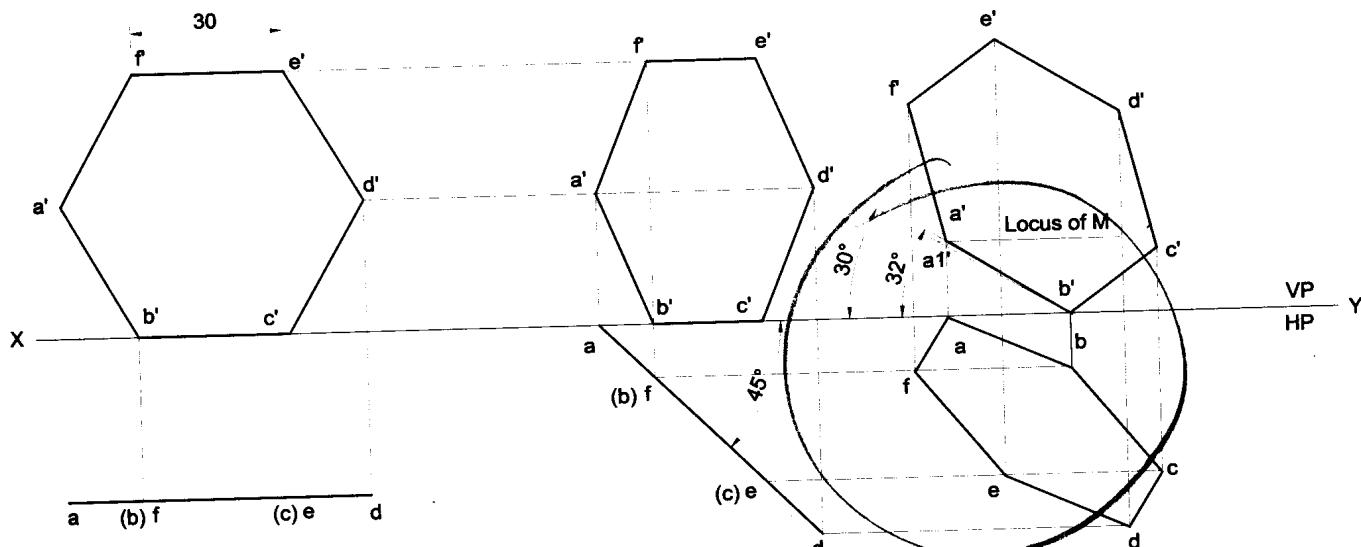
Problem 31 A pentagonal lamina having edges 25mm is placed on one of its corners on VP such that the surface makes an angle 30° with VP and perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 45° to HP. Draw the top and front views of the lamina.

Solution



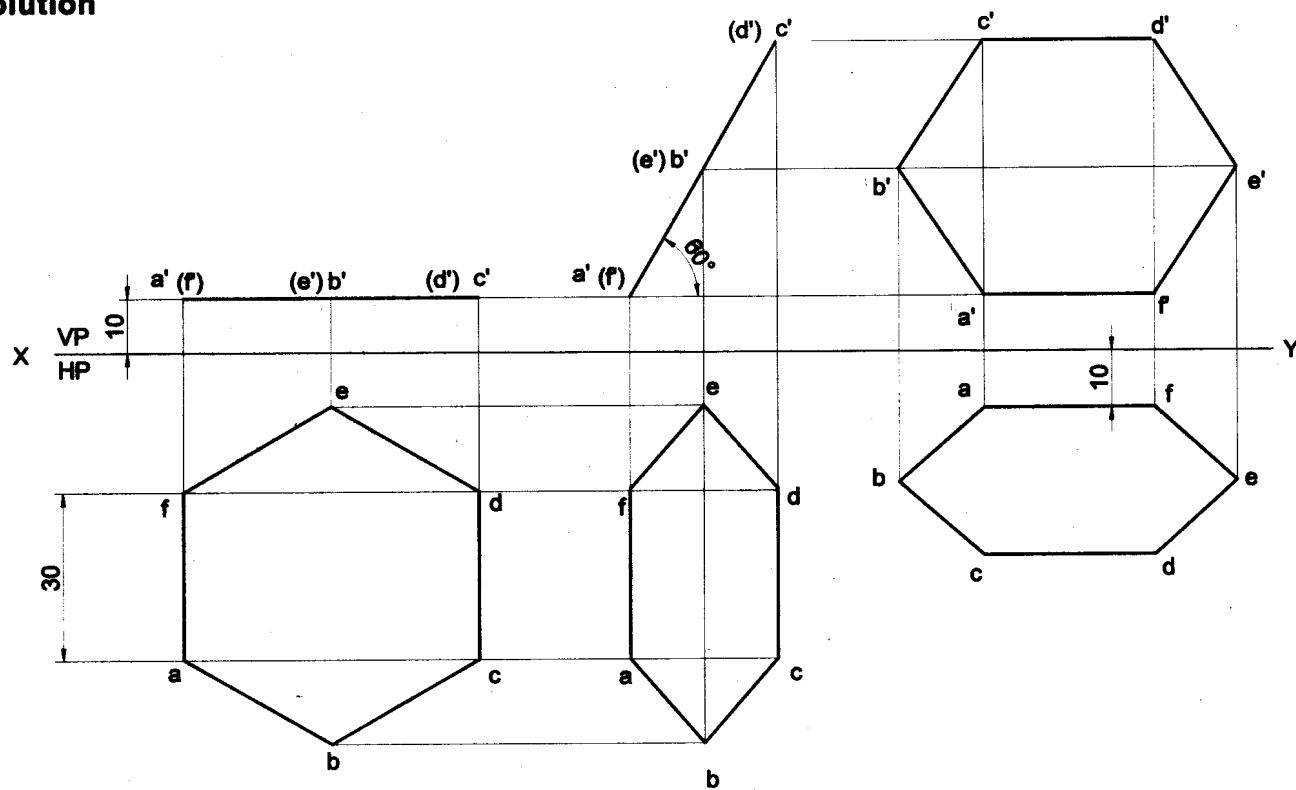
Problem 32 A hexagonal lamina of 30mm sides rests on HP with one of its corners touching VP and surface inclined at 45° to it. One of its edges is inclined to HP at 30° . Draw the front and top views of the lamina in its final position.

Solution



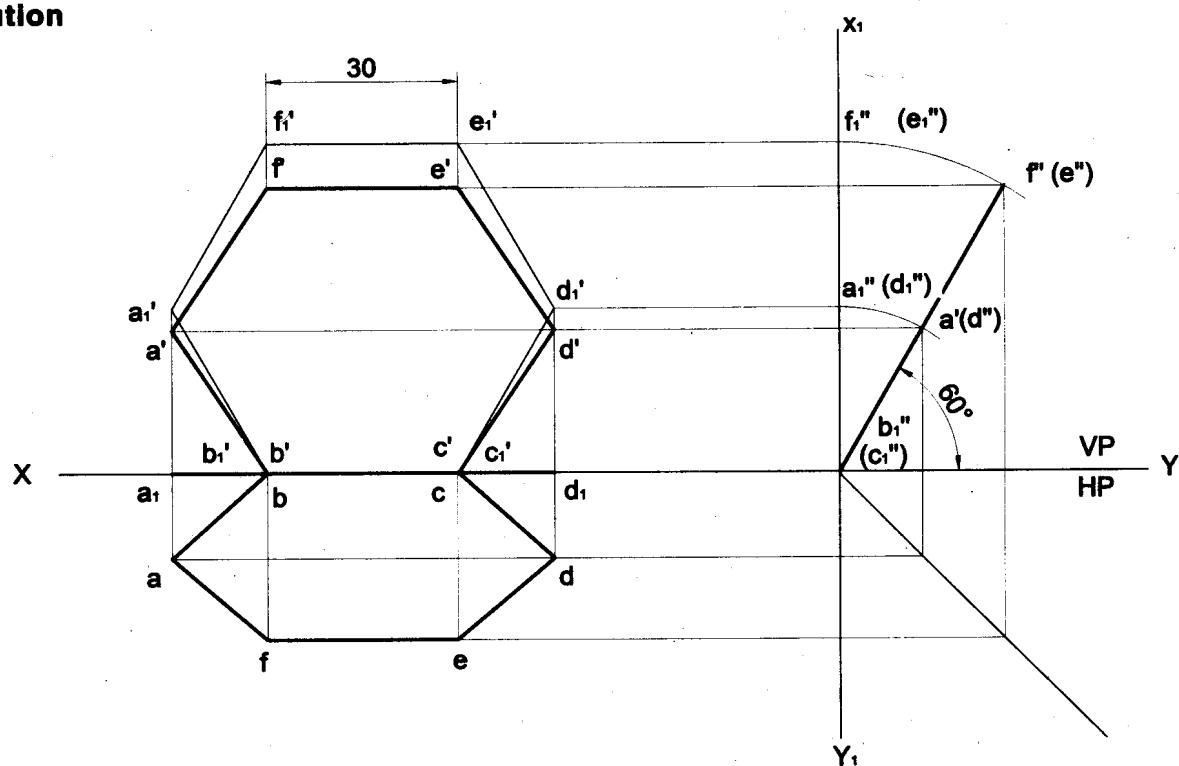
Problem 33 Draw the top and front views of a hexagonal lamina of 30mm sides having two of its edges parallel to both vertical and horizontal planes and one of its edges is 10mm from each of the planes of projection. The surface of the lamina is inclined at an angle of 60° to the HP.

Solution



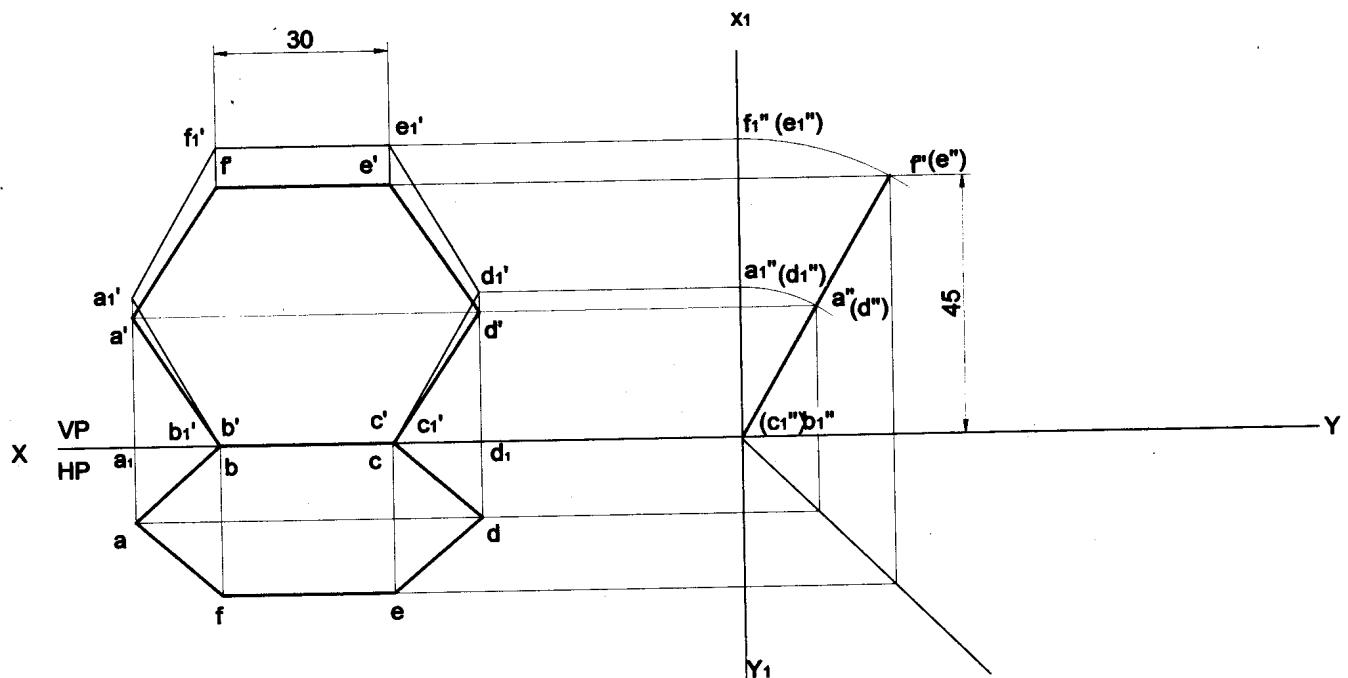
Problem 34 A regular hexagonal lamina of sides 30mm is lying in such a way that one of its sides touches both the reference planes. If the lamina makes 60° with HP, draw the projections of the lamina.

Solution



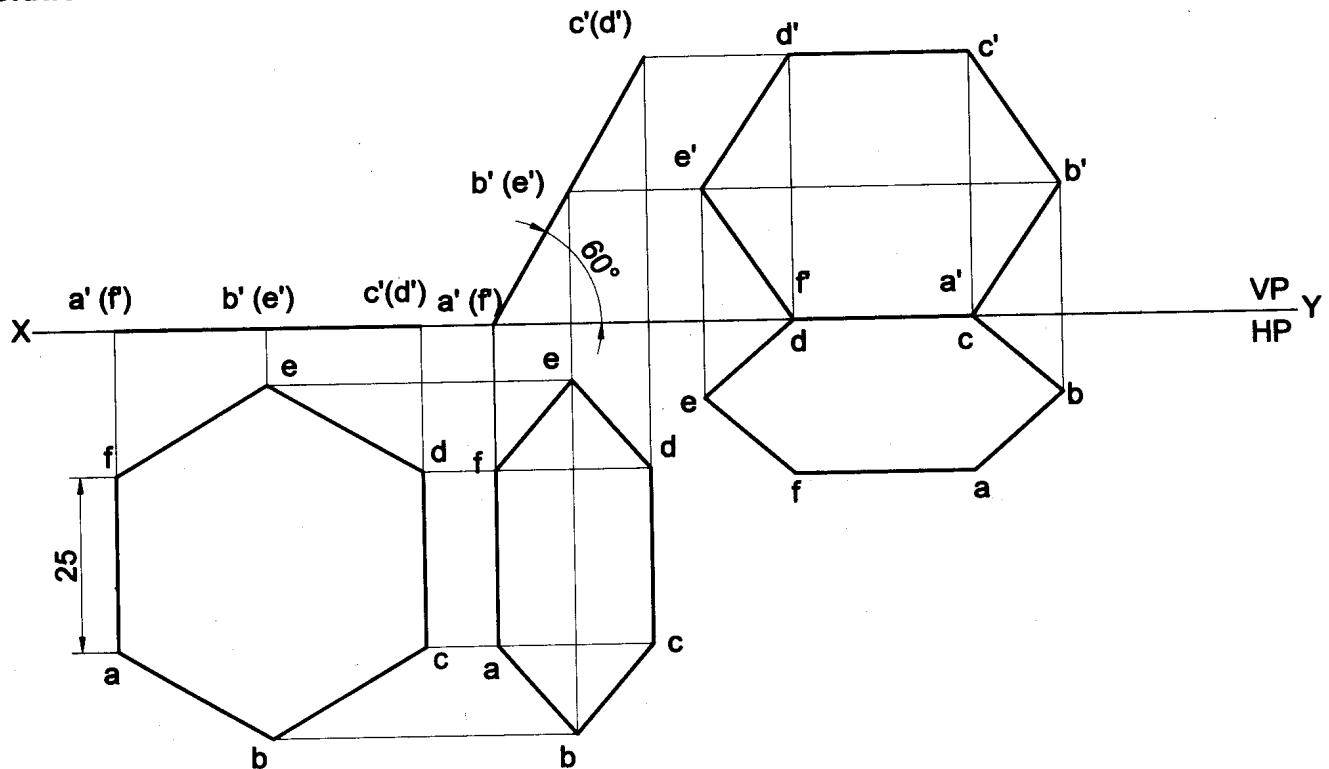
Problem 35 A regular hexagonal lamina of side 30mm is lying in such a way that one of its sides touches both the reference planes. If the side opposite to the side on which it rests is 45mm above HP, draw the projections of the lamina.

Solution



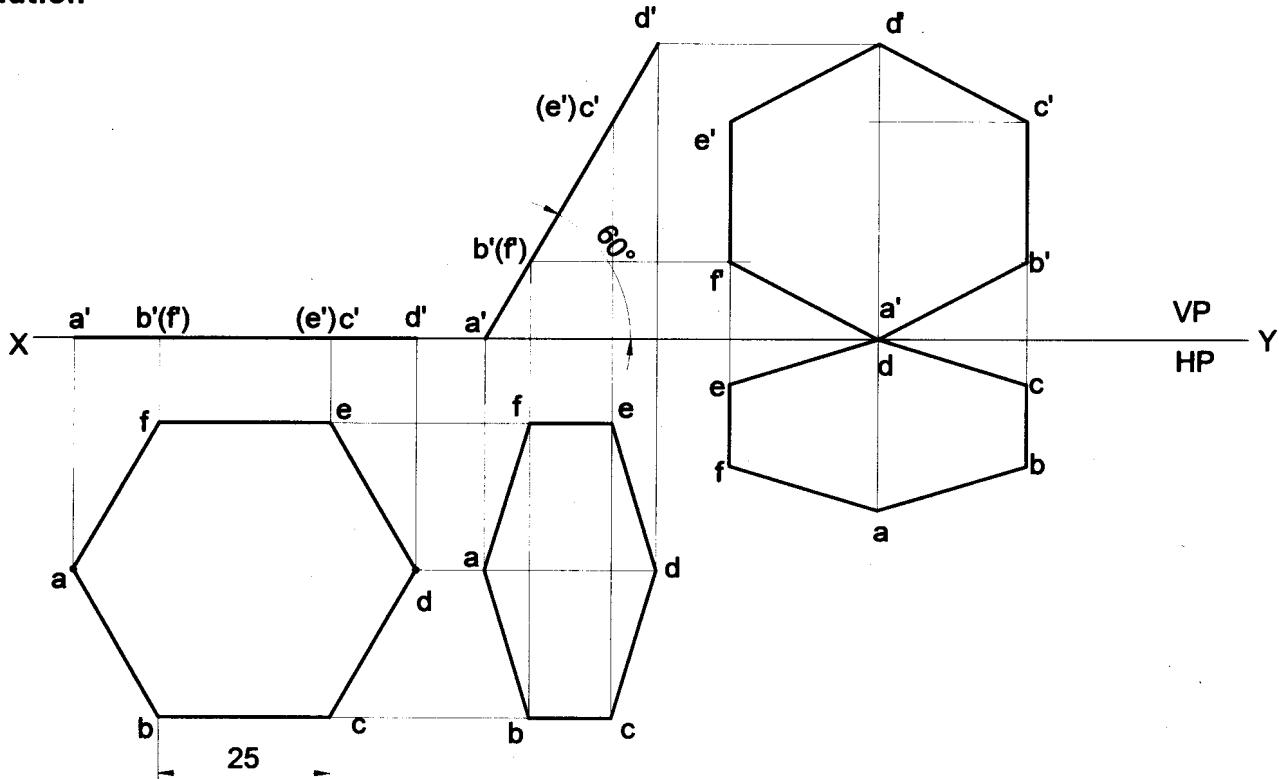
Problem 36 A regular hexagonal lamina of sides 25mm is lying in such a way that one of its sides on HP while the side opposite to the side on which it rests is on VP. If the lamina makes 60° to HP, Draw the projections of the lamina.

Solution



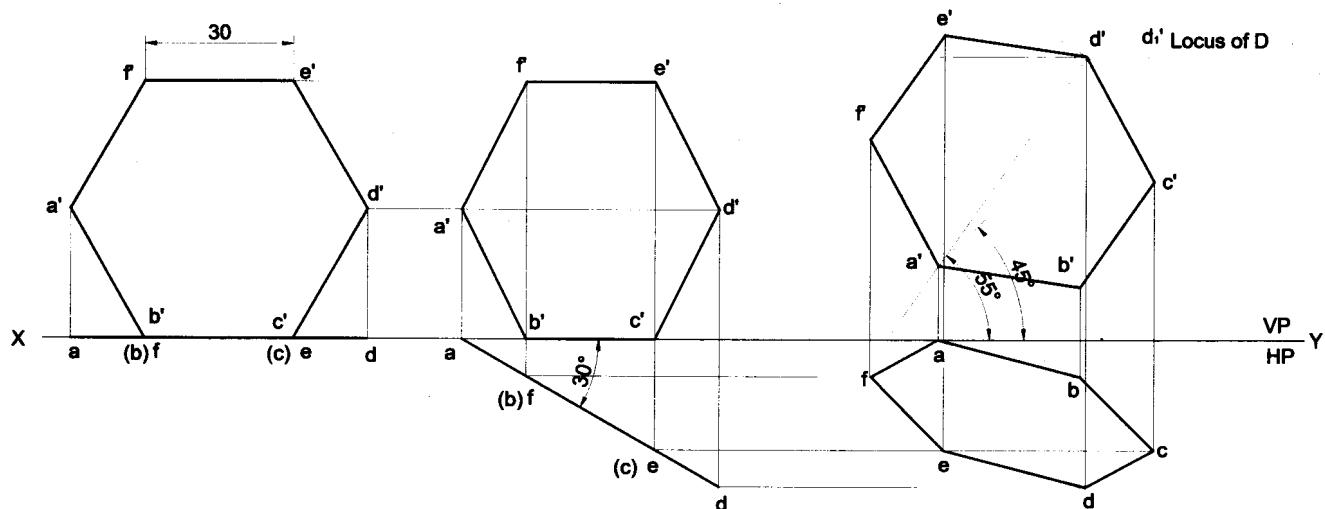
Problem 37 A regular hexagonal lamina of side 25mm is lying in such a way that one of its corners on HP while the corner opposite to the corner on which it rests is on VP. If the lamina makes 60° to HP, Draw the projections of the lamina.

Solution



Problem 38 A hexagonal lamina of sides 30mm is resting on HP with one of its corners in VP and its surface inclined at an angle of 30° with VP. The diagonal passing through that corner which is in VP is inclined at 45° to HP. Draw the projections of the lamina.

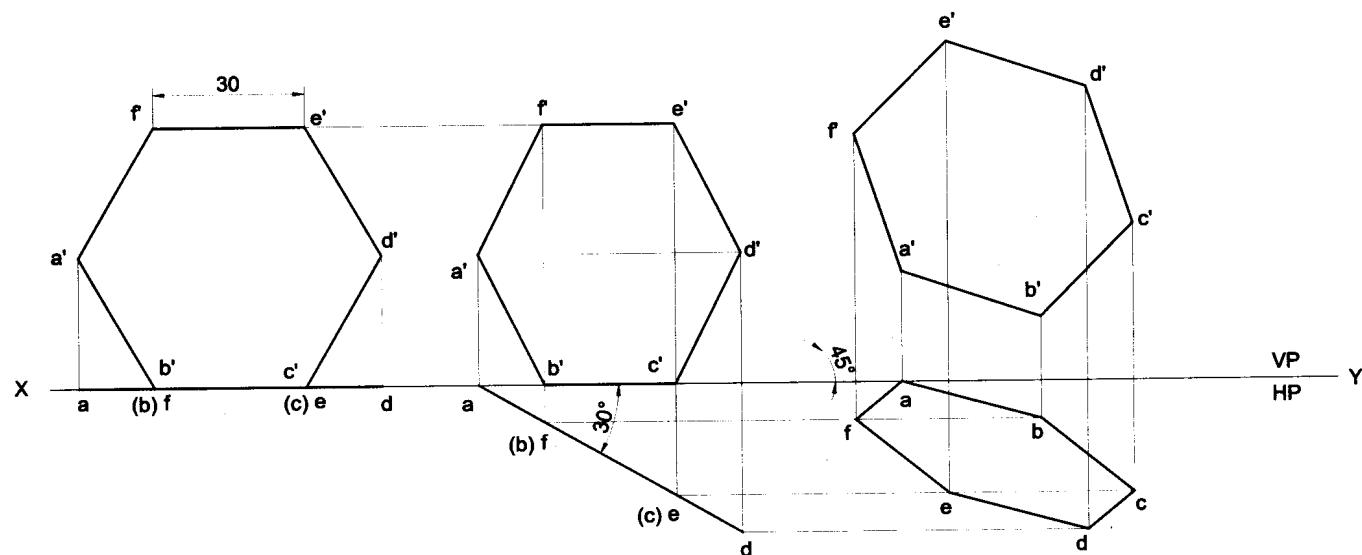
Solution



Scanned - 2009

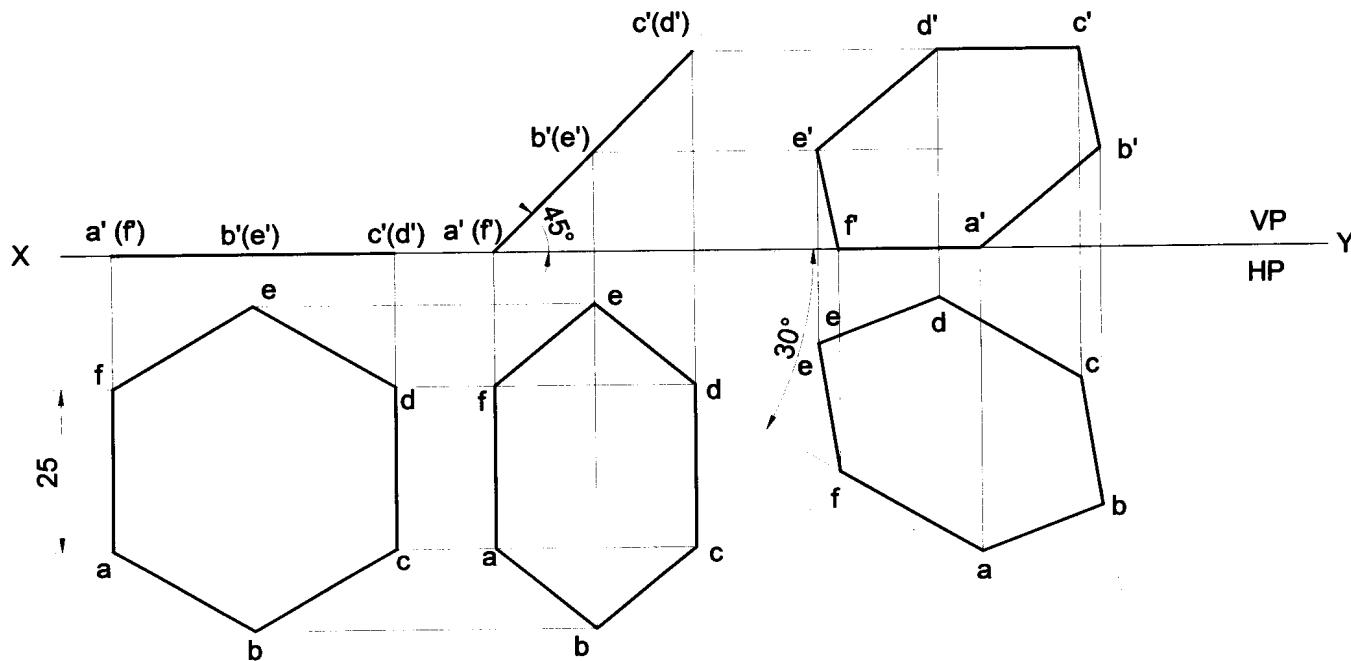
Problem 39 A hexagonal lamina of sides 30mm is resting on HP with one of its corners in VP and its surface inclined at an angle of 30° with VP. The diagonal passing through that corner which is in VP appears to be inclined at 40° to HP. Draw the projections of the lamina.

Solution



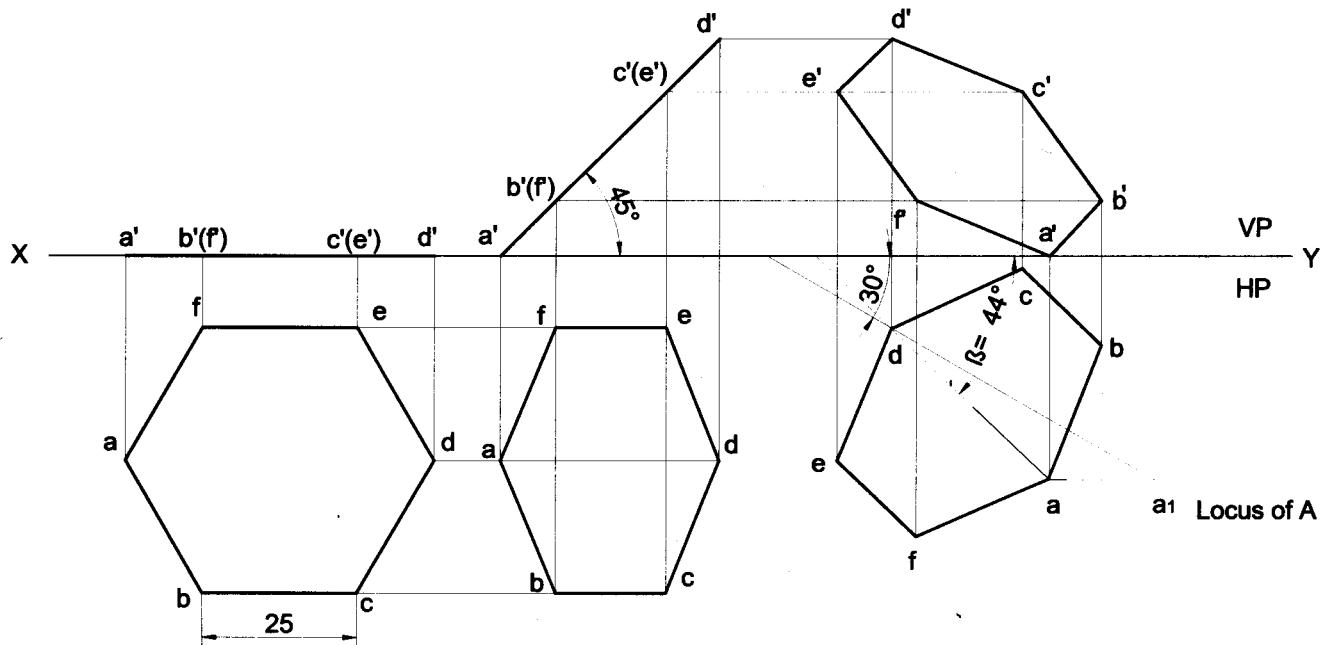
Problem 40 A hexagonal lamina of sides 25mm rests on one of its sides on HP. The lamina makes 45° to HP and the side on which it rests makes 30° to VP. Draw its projections.

Solution



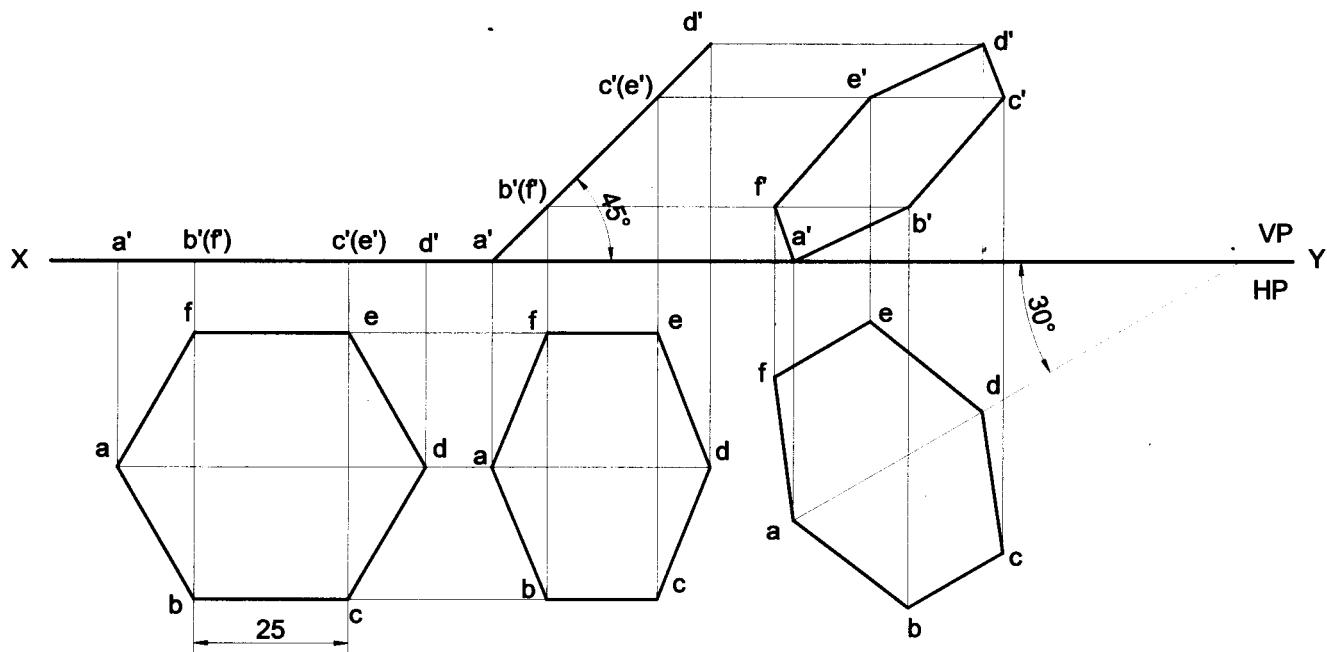
Problem 41 A hexagonal lamina of sides 25mm rests on one of its corners on HP. The lamina makes 45° to HP and the diagonal passing through the corner on which it rests is inclined at 30° to VP. Draw its projections.

Solution



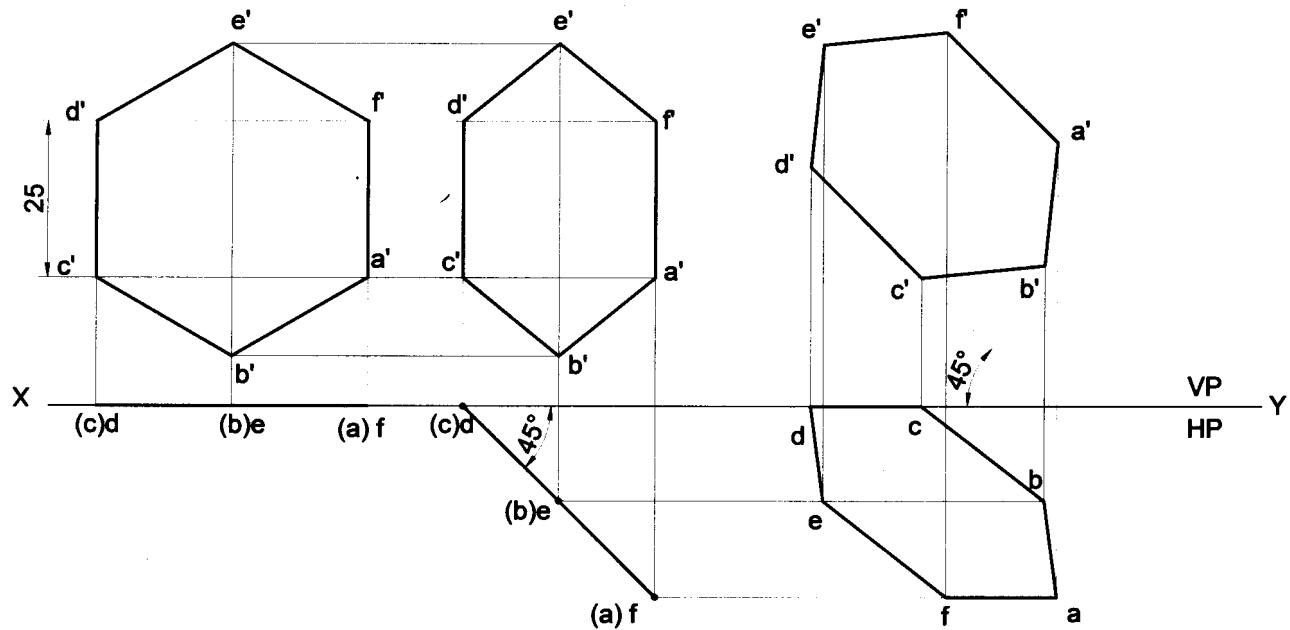
Problem 42 A hexagonal lamina of sides 25mm rests on one of its corners on HP. The lamina makes 45° to HP and the diagonal passing through the corner on which it rests appears to be inclined at 30° to VP. Draw its projections.

Solution



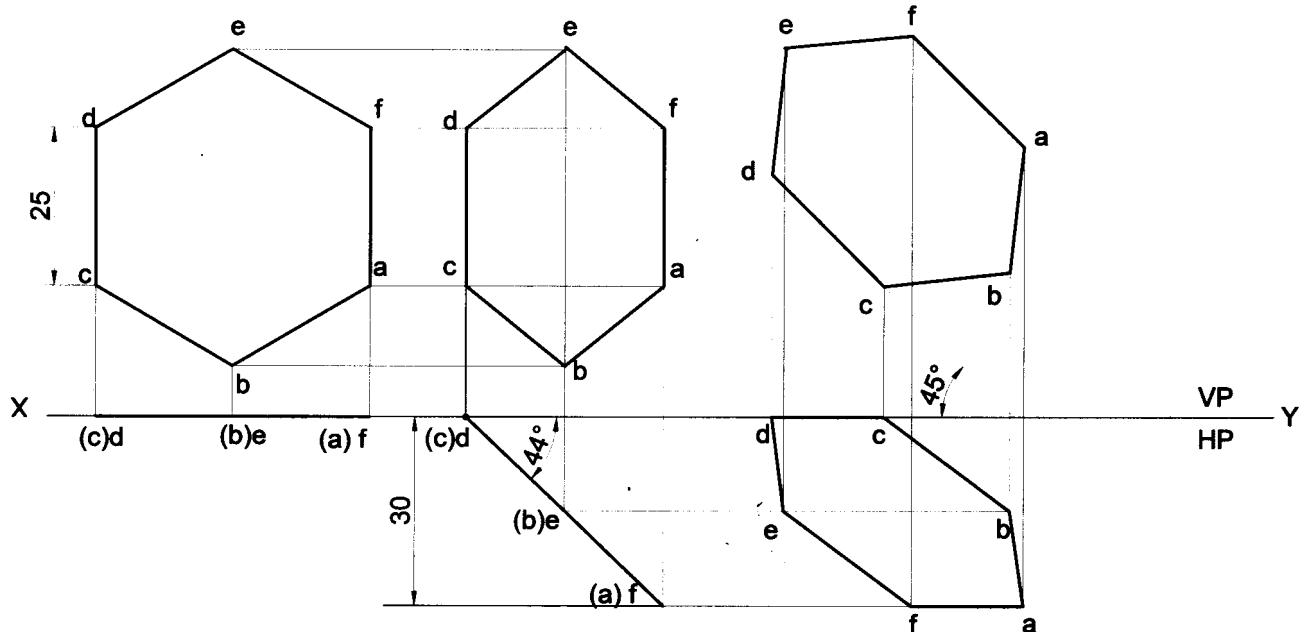
Problem 43 A hexagonal lamina of sides 25mm rests on one of its sides on VP. The lamina makes 45° to VP and the side on which it rests makes 45° to HP. Draw its projections.

Solution



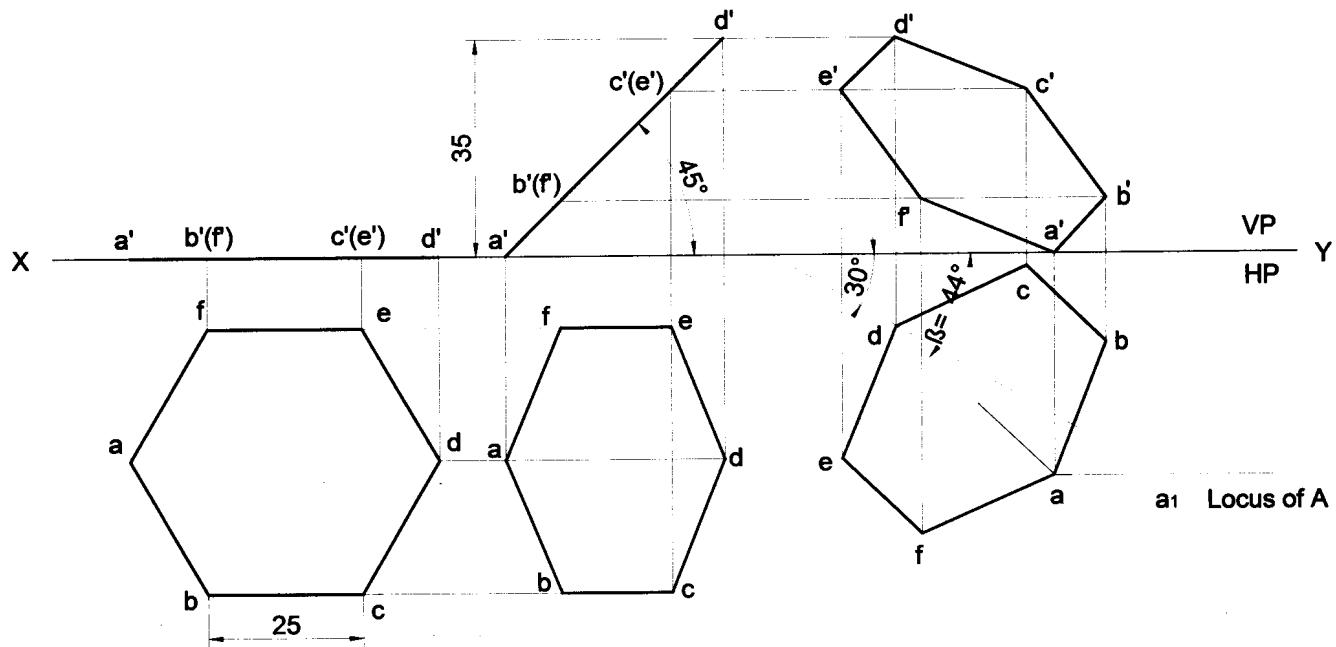
Problem 44 A hexagonal lamina of sides 25mm rests on one of its sides on VP. The side opposite to the side on which it rests is 30mm in front of VP & the side on which it rests makes 45° to HP. Draw its projections. Also determine the inclination of the lamina with the reference plane.

Solution



Problem 45 A hexagonal lamina of sides 25mm rests on one of its corners on HP. The corner opposite to the corner on which it rests is 35mm above HP and the diagonal passing through the corner on which it rests is inclined at 30° to VP. Draw its projections. Find the inclination of the surface with HP.

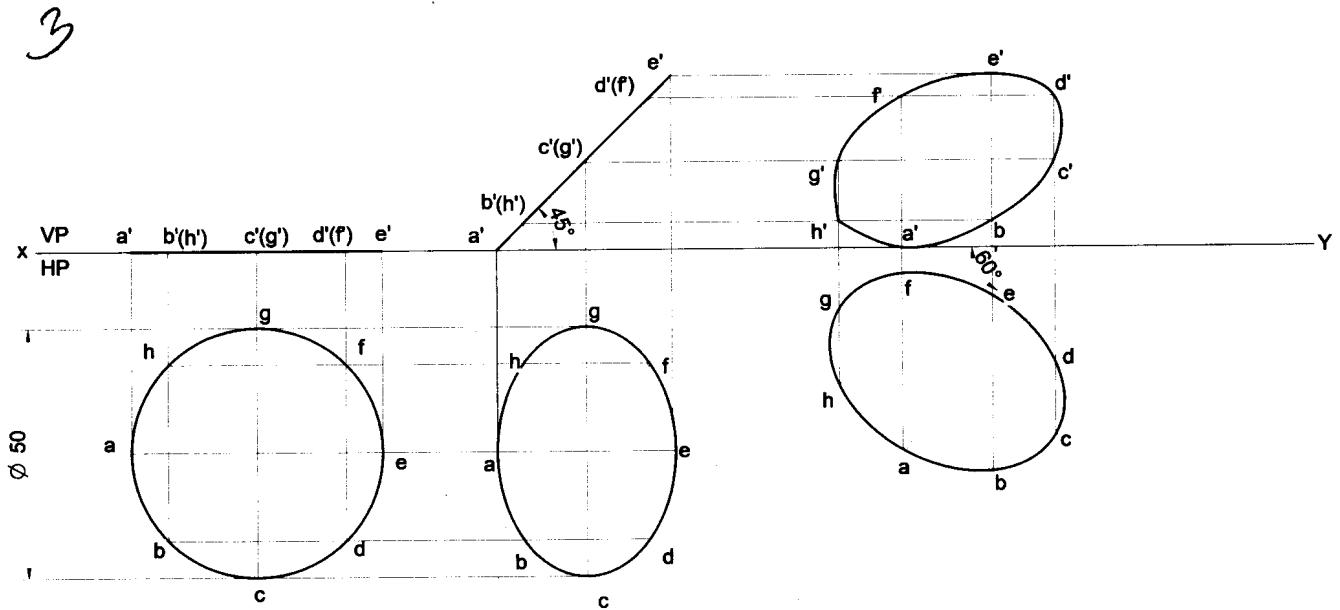
Solution



a1 Locus of A

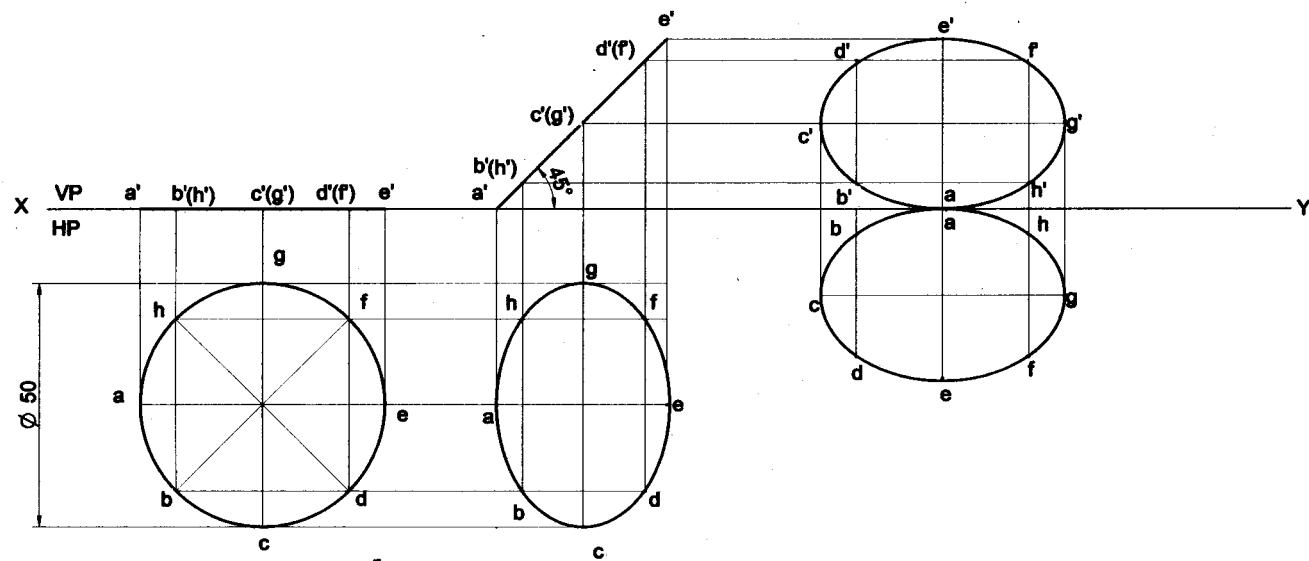
Problem 46 Draw the projections of a circular plate of negligible thickness of 50mm diameter resting on HP on a point A on the circumference, with its plane inclined at 45° to HP and the top view of the diameter passing through the resting point makes 60° with VP.

Solution



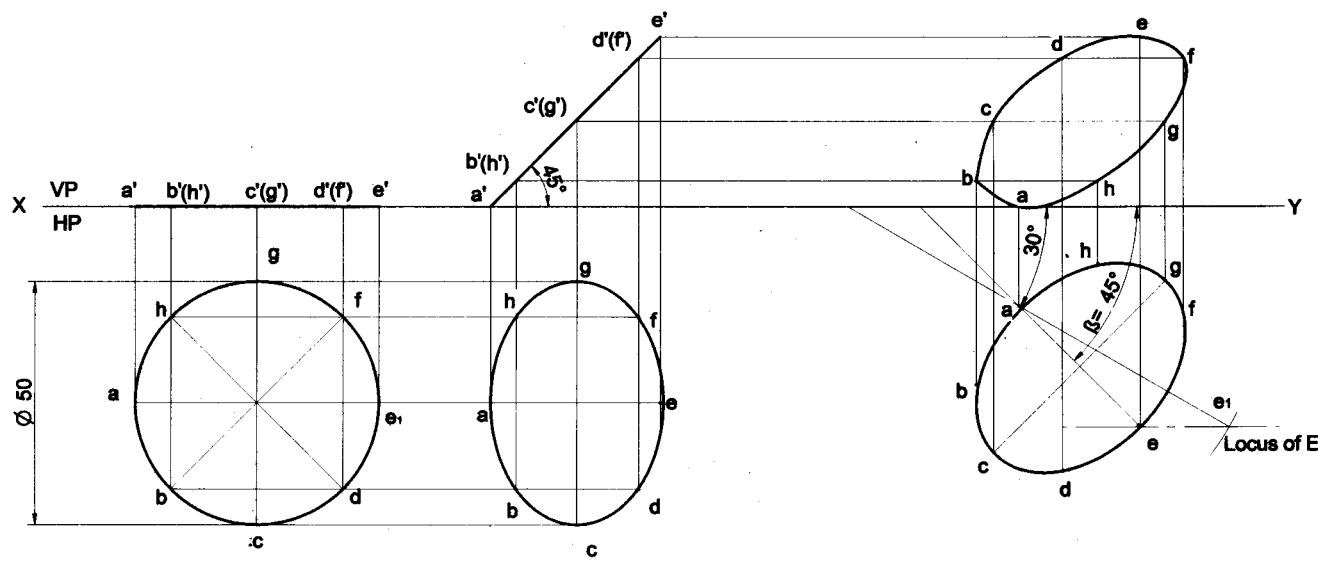
Problem 47 A circular lamina of 50mm diameter is standing with one of its points on the rim on HP and the lamina inclined at 45° to HP. The diameter at right angles to the diameter which is passing through the point on which the lamina rests is parallel to VP. Draw its projections.

Solution



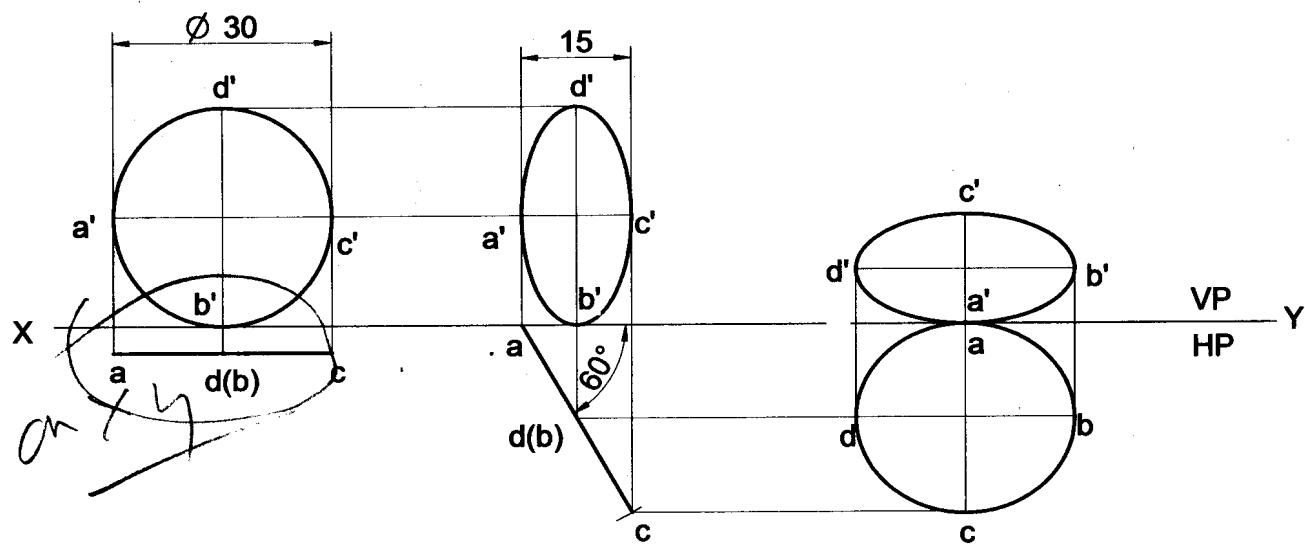
Problem 48 A circular lamina of 50mm diameter rests on HP such that one of its diameters is inclined at 30° to VP and 45° to HP. Draw its top and front views in this position.

Solution



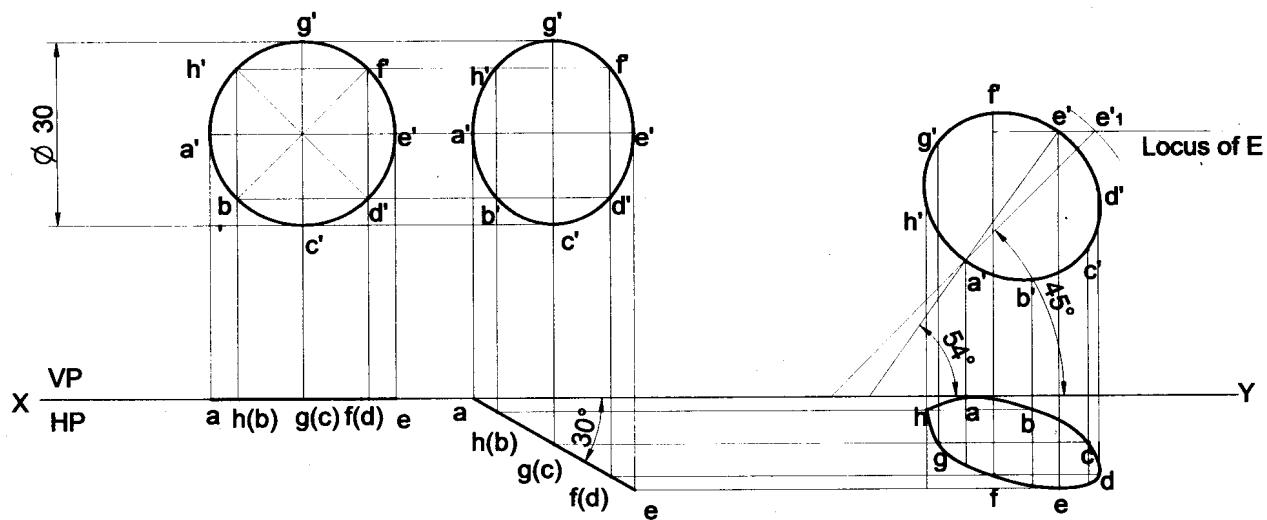
Problem 49 A circular lamina inclined to the VP appears in the front view as an ellipse of major axis 30mm and minor axis 15mm. The major axis is parallel to both HP and VP. One end of the minor axis is in both the HP and VP. Draw the projections of the lamina and determine the inclination of the lamina with the VP.

Solution



Problem 50 A circular lamina of 30mm diameter rests on VP such that one of its diameters is inclined at 30° to VP and 45° to HP. Draw its top and front views in this position.

Solution



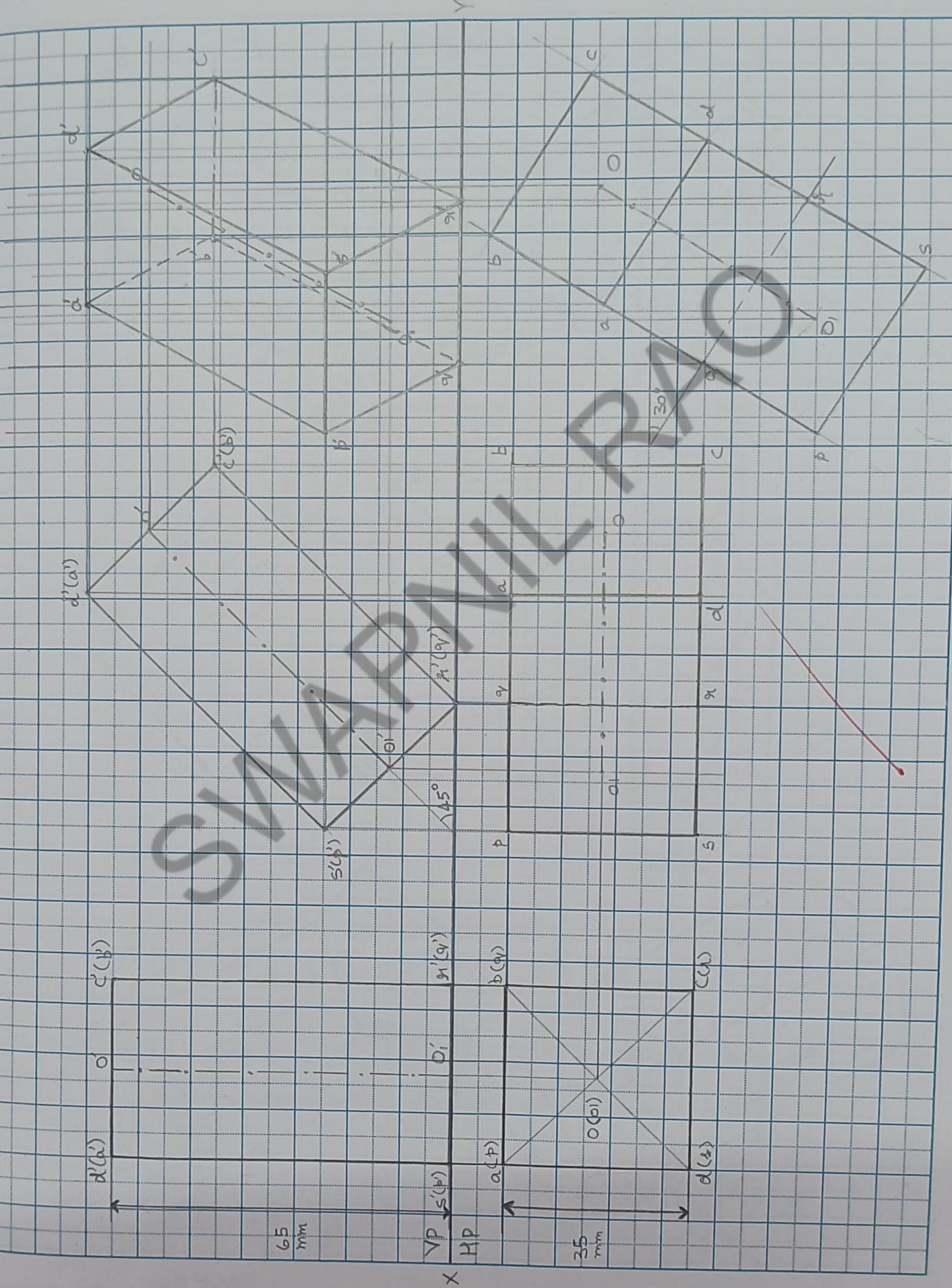
SOLID(S):

REFERENCE PLAYLIST:

**[https://www.youtube.com/watch?
v=f2KuSfj63UE&list=PLDN15nk5uLiA9qy-
OWuoEYoXsu7lsSaE9](https://www.youtube.com/watch?v=f2KuSfj63UE&list=PLDN15nk5uLiA9qy-OWuoEYoXsu7lsSaE9)**

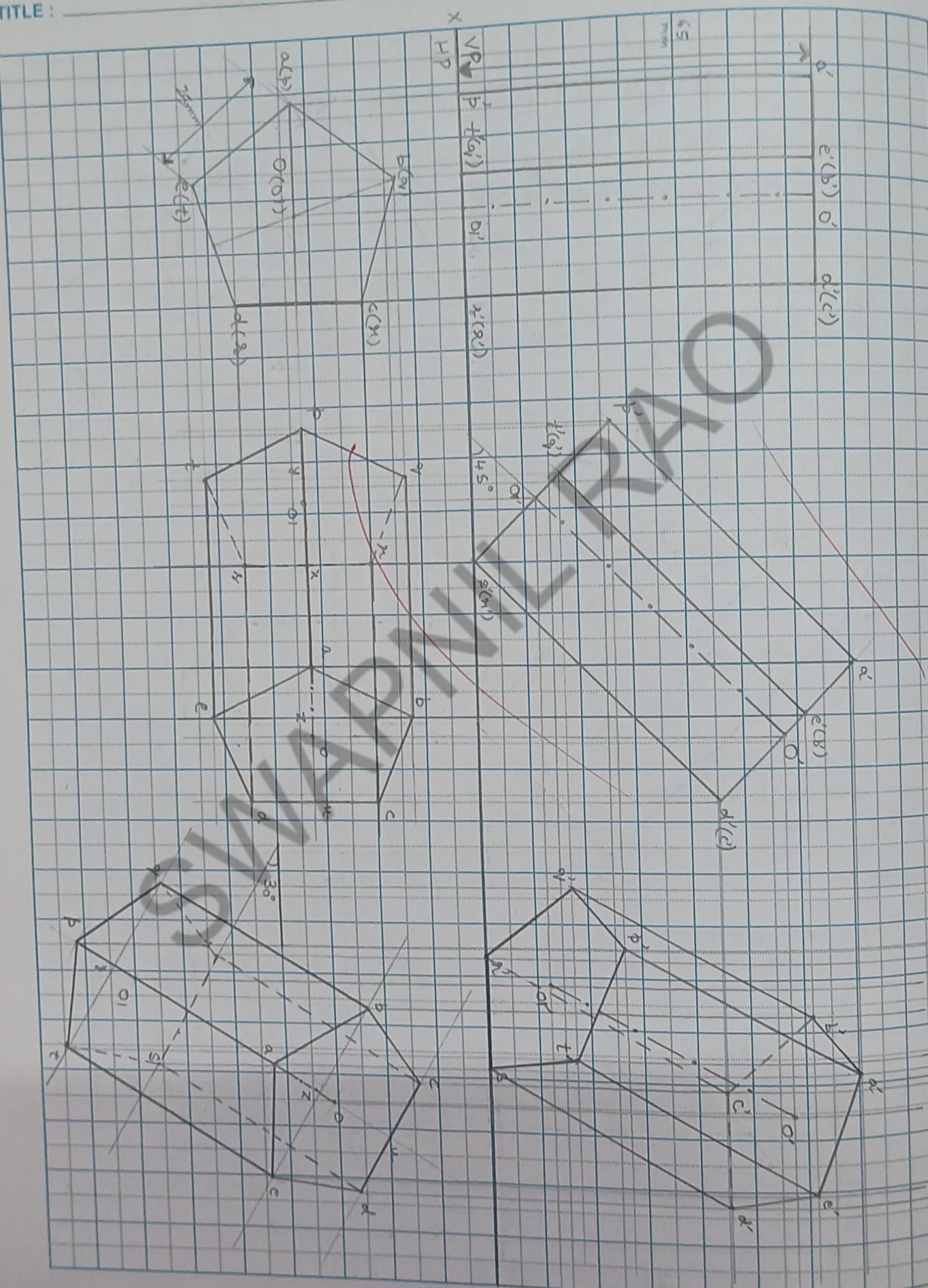
TITLE : _____

SCALE : _____



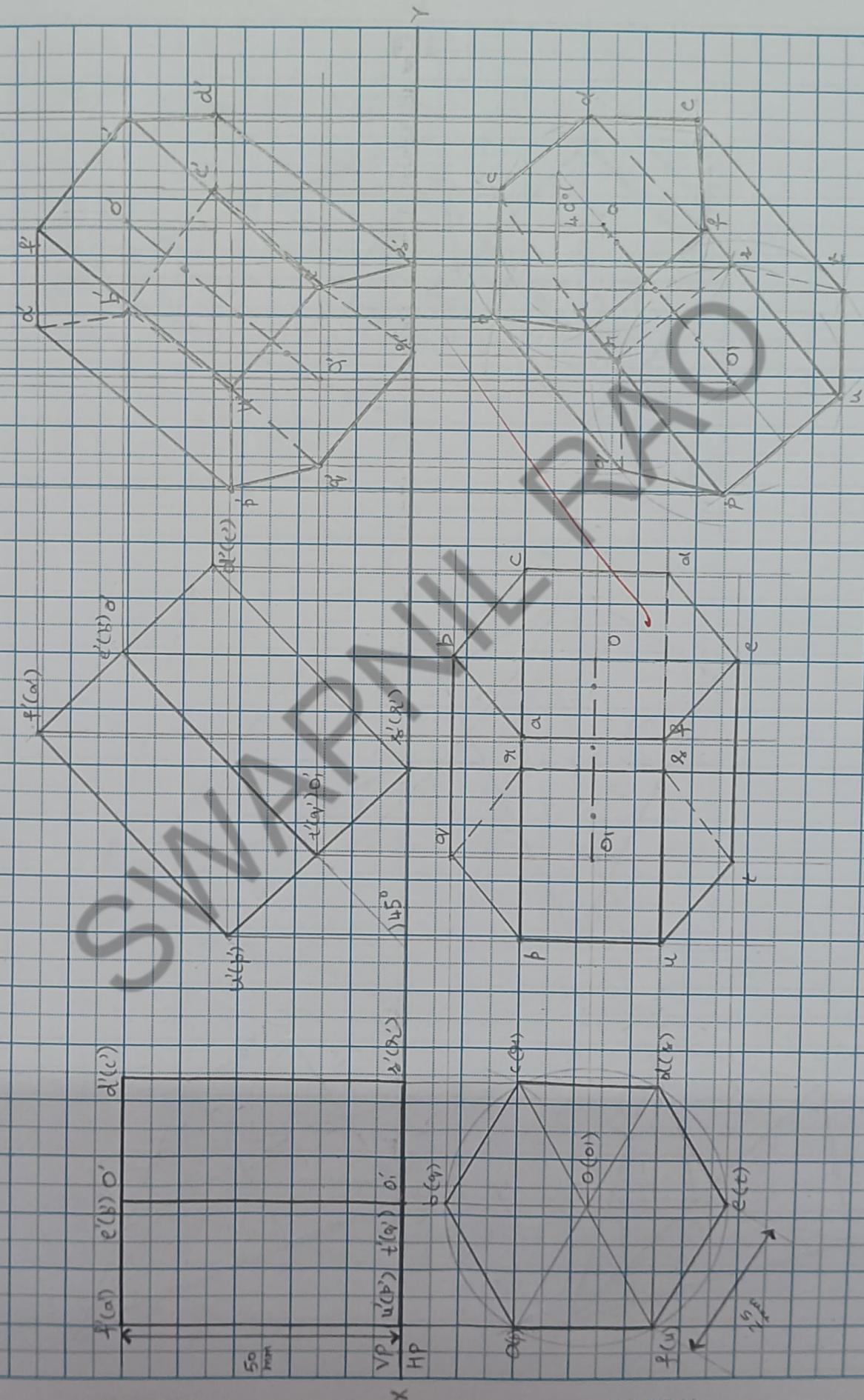
SCALE :

TITLE :



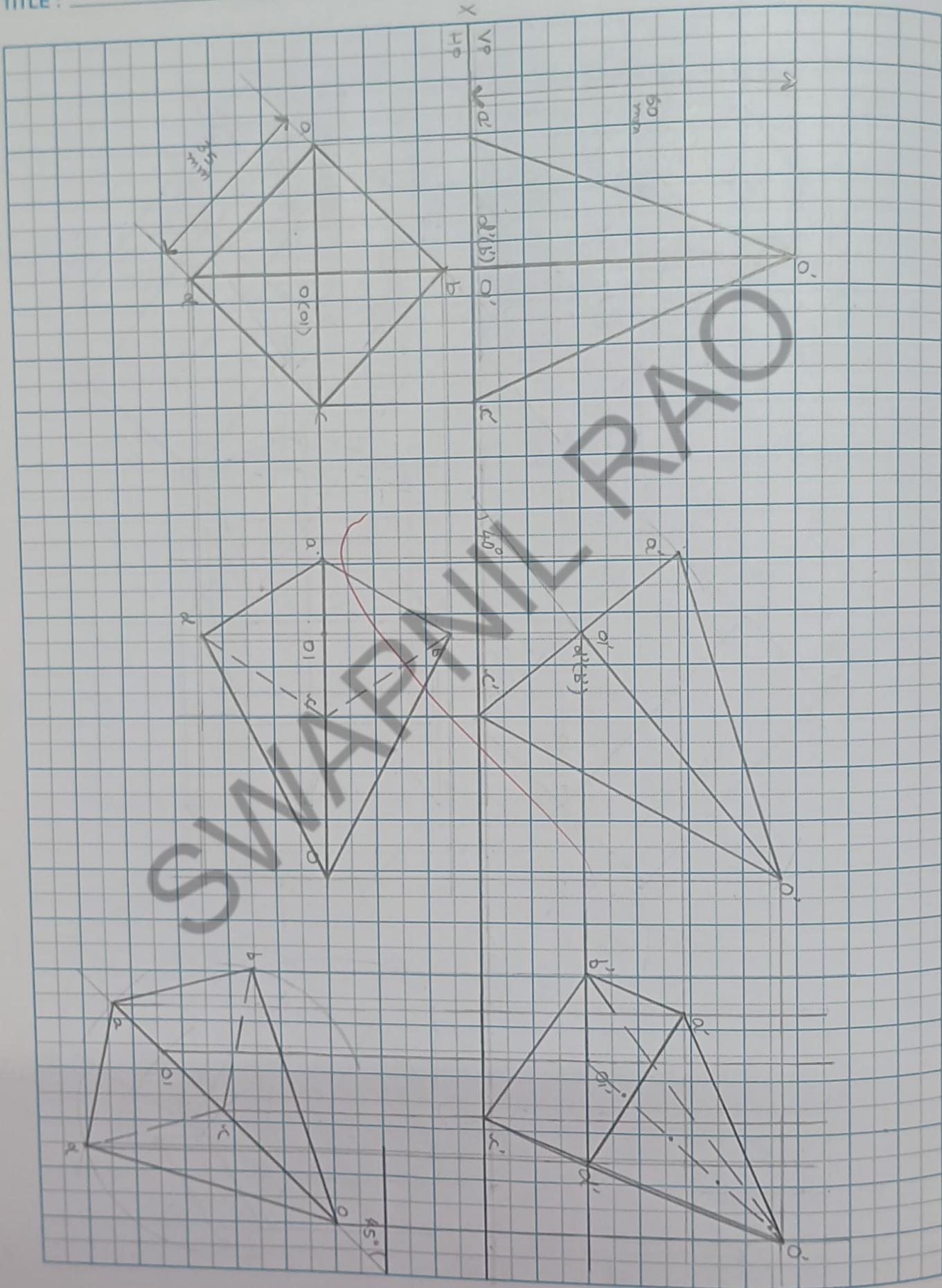
TITLE : _____

SCALE : _____

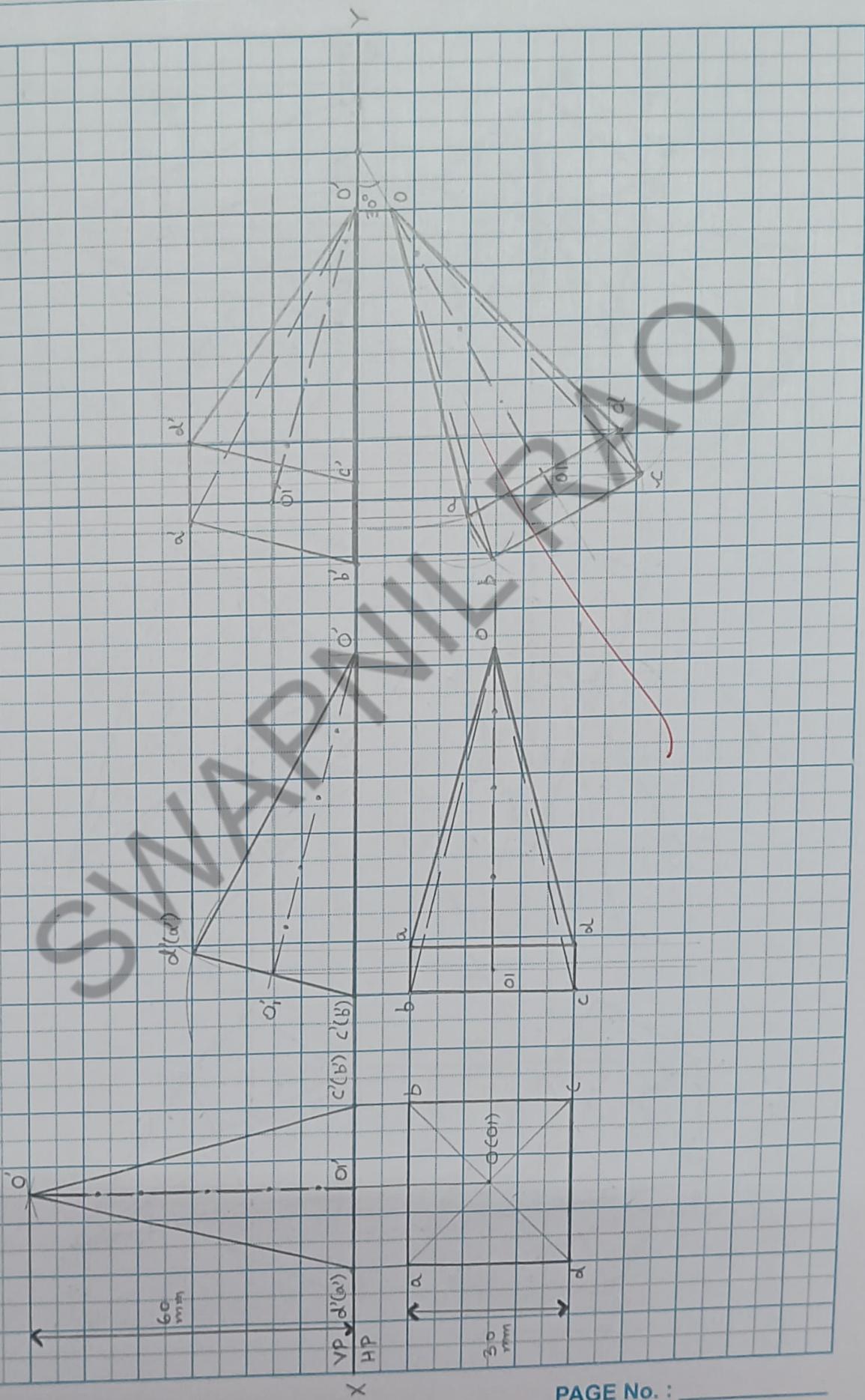


SCALE : _____

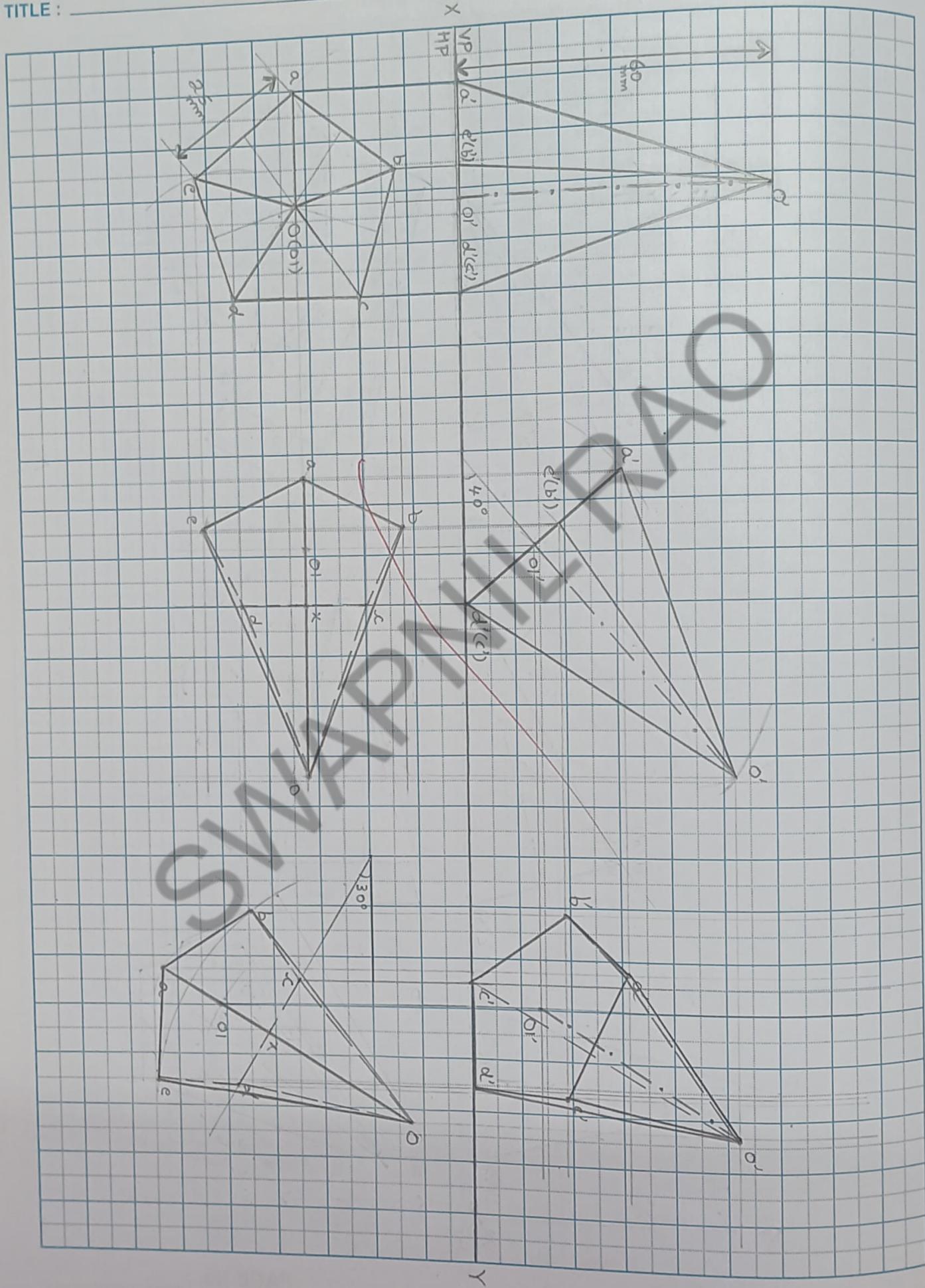
TITLE : _____

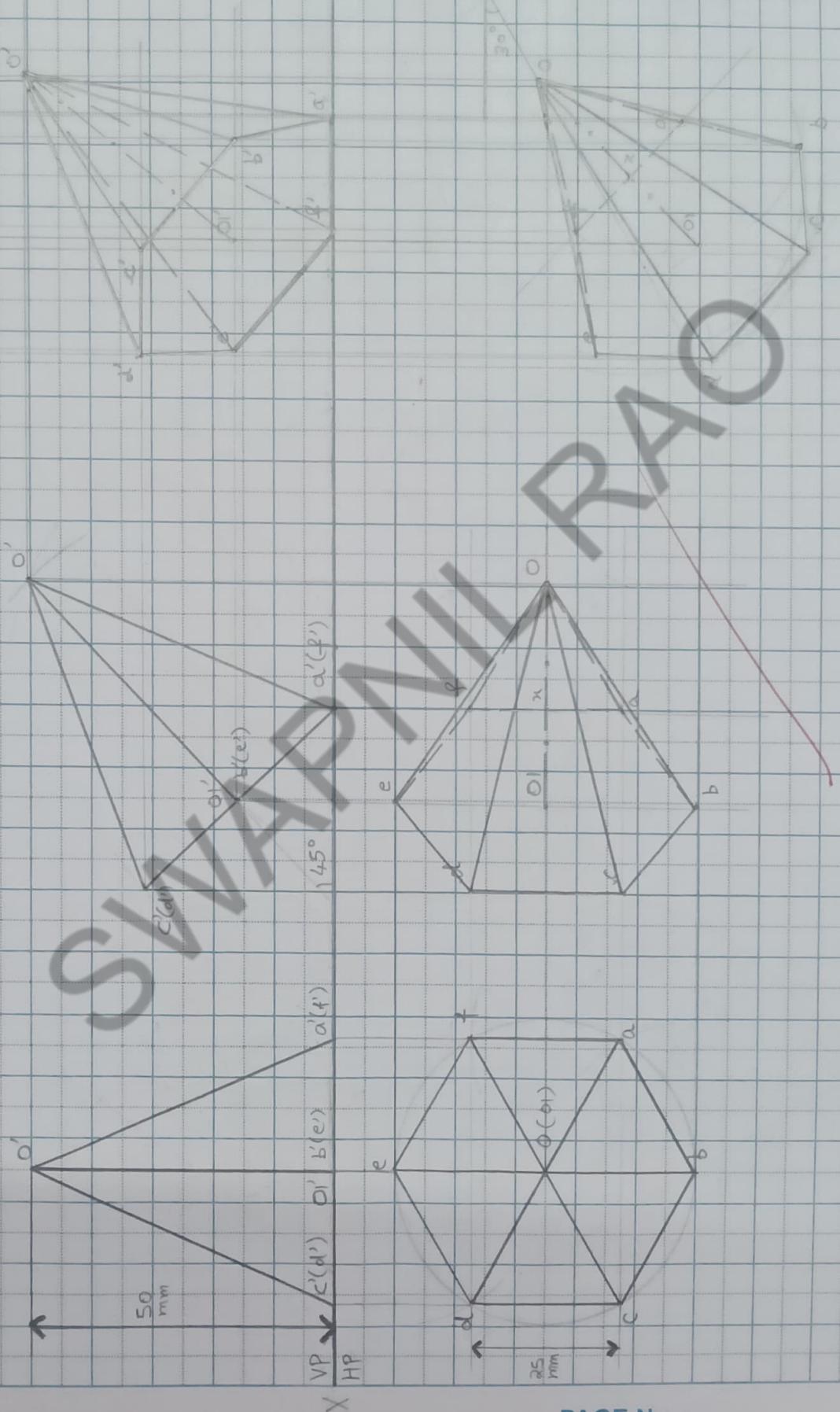


SCALE : _____



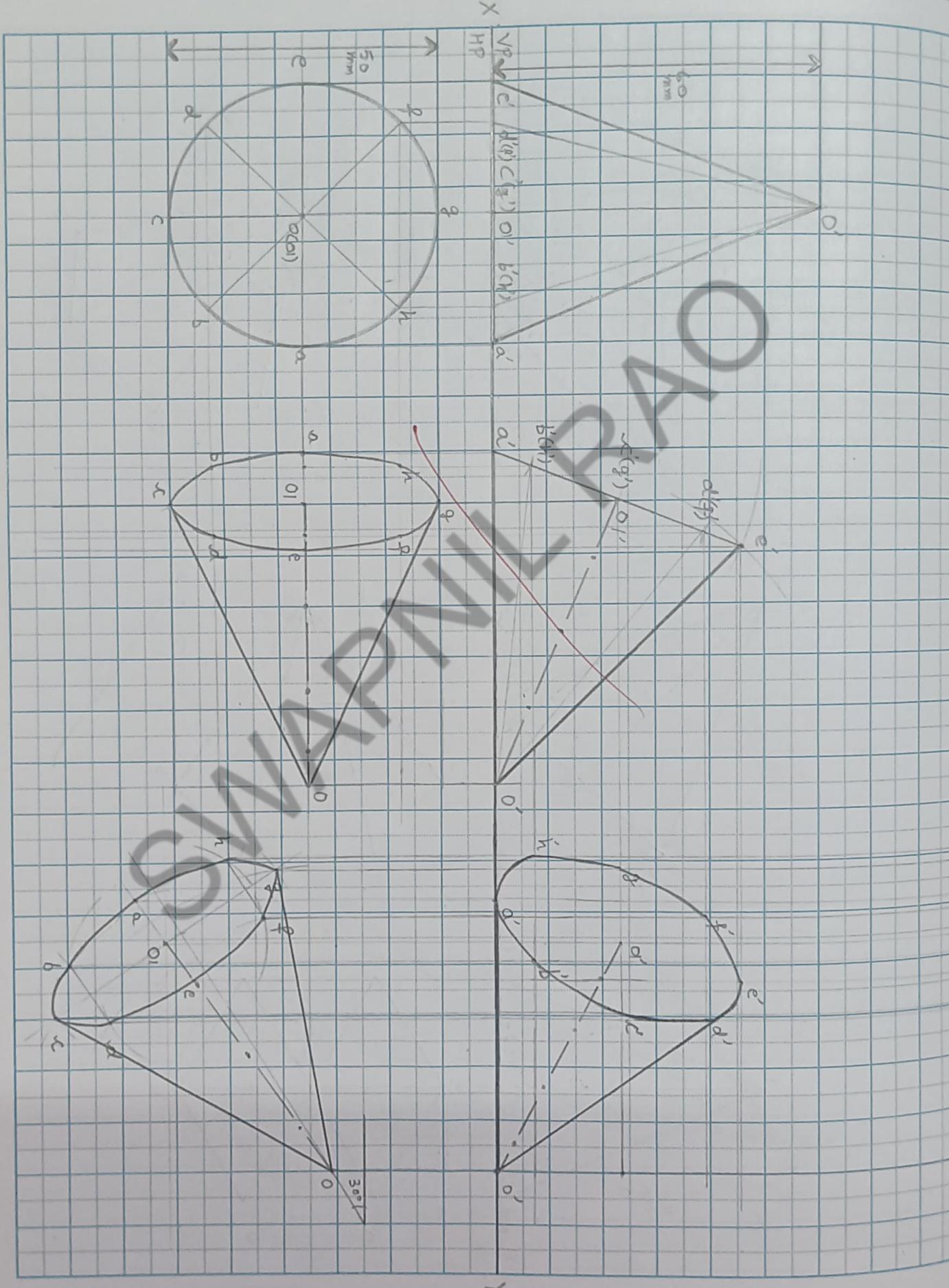
TITLE : _____



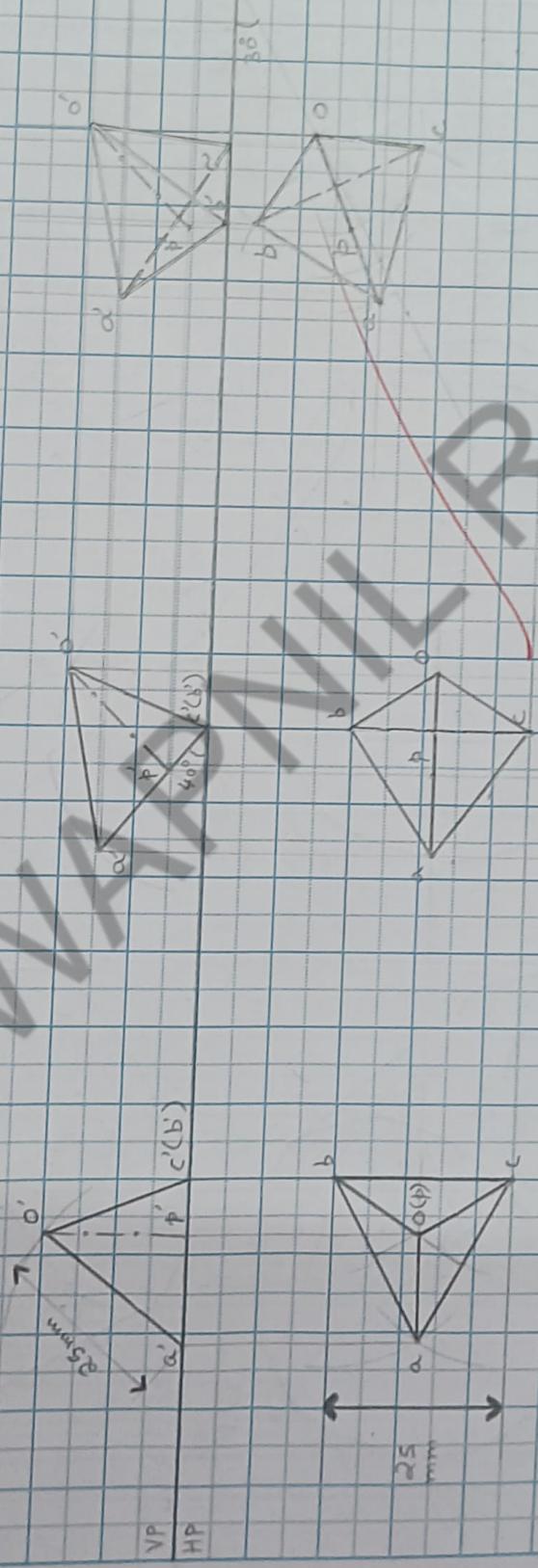


TITLE : _____

SCALE : _____

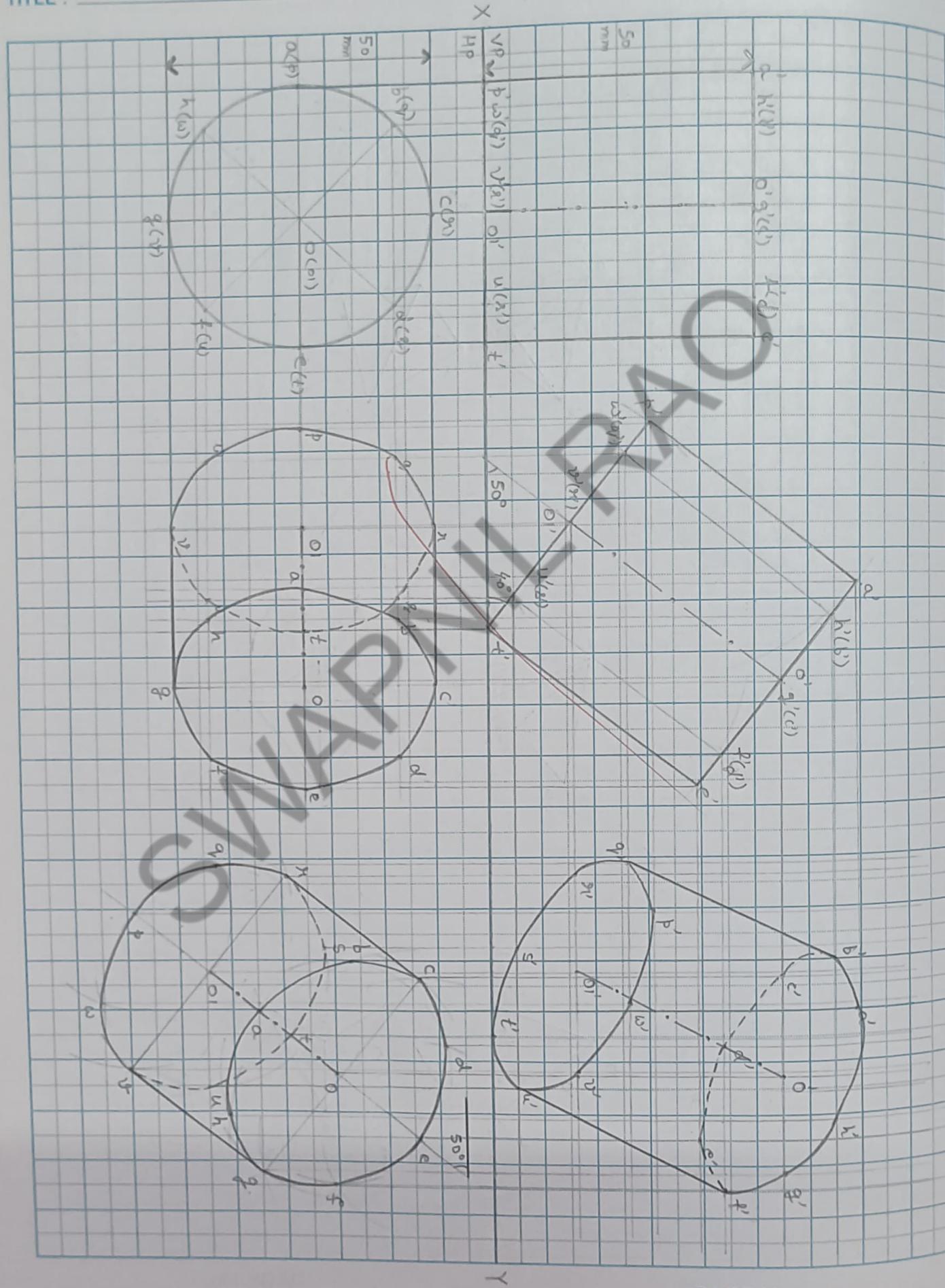


SCALE : _____



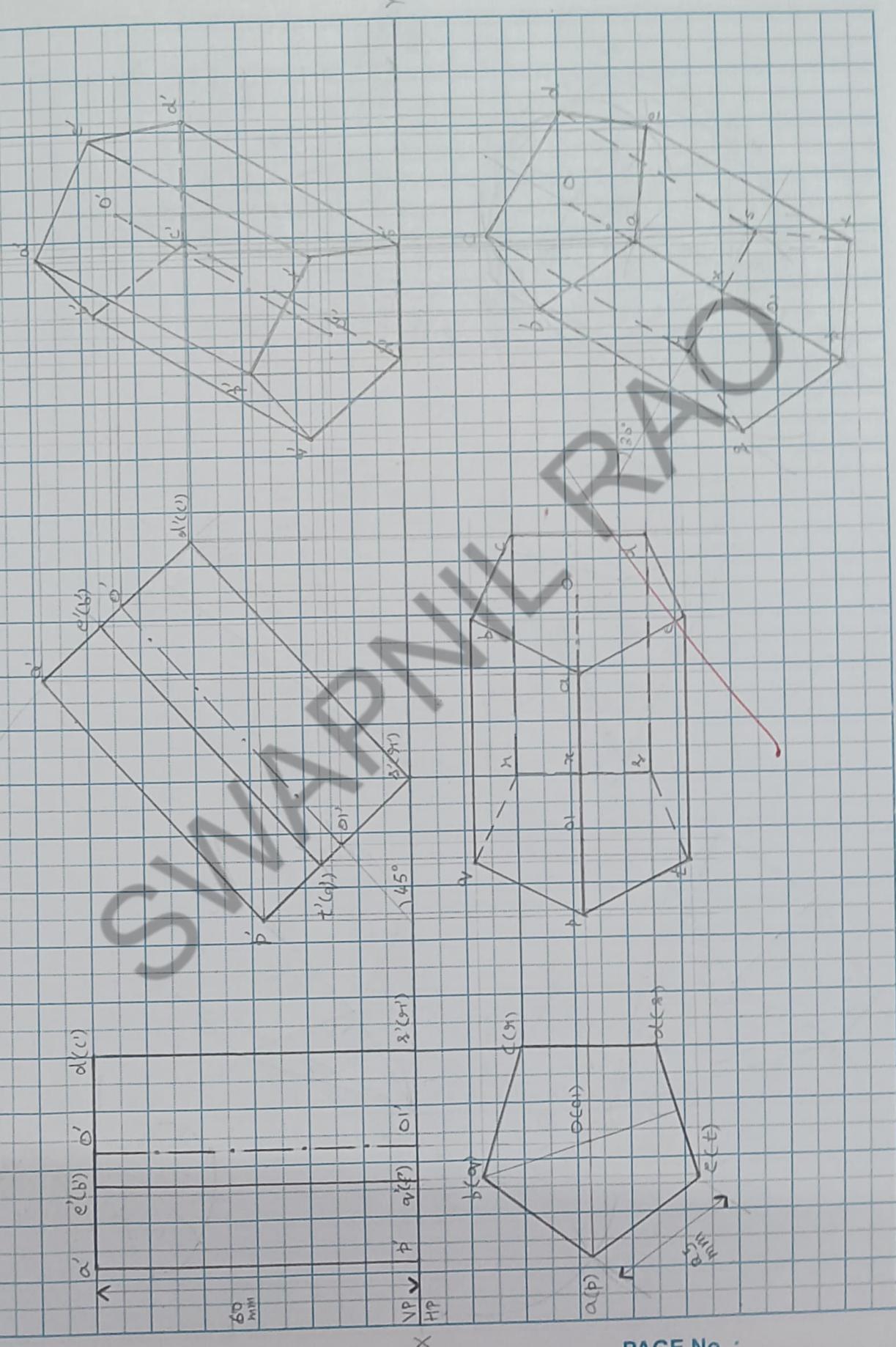
TITLE : _____

SCALE : _____



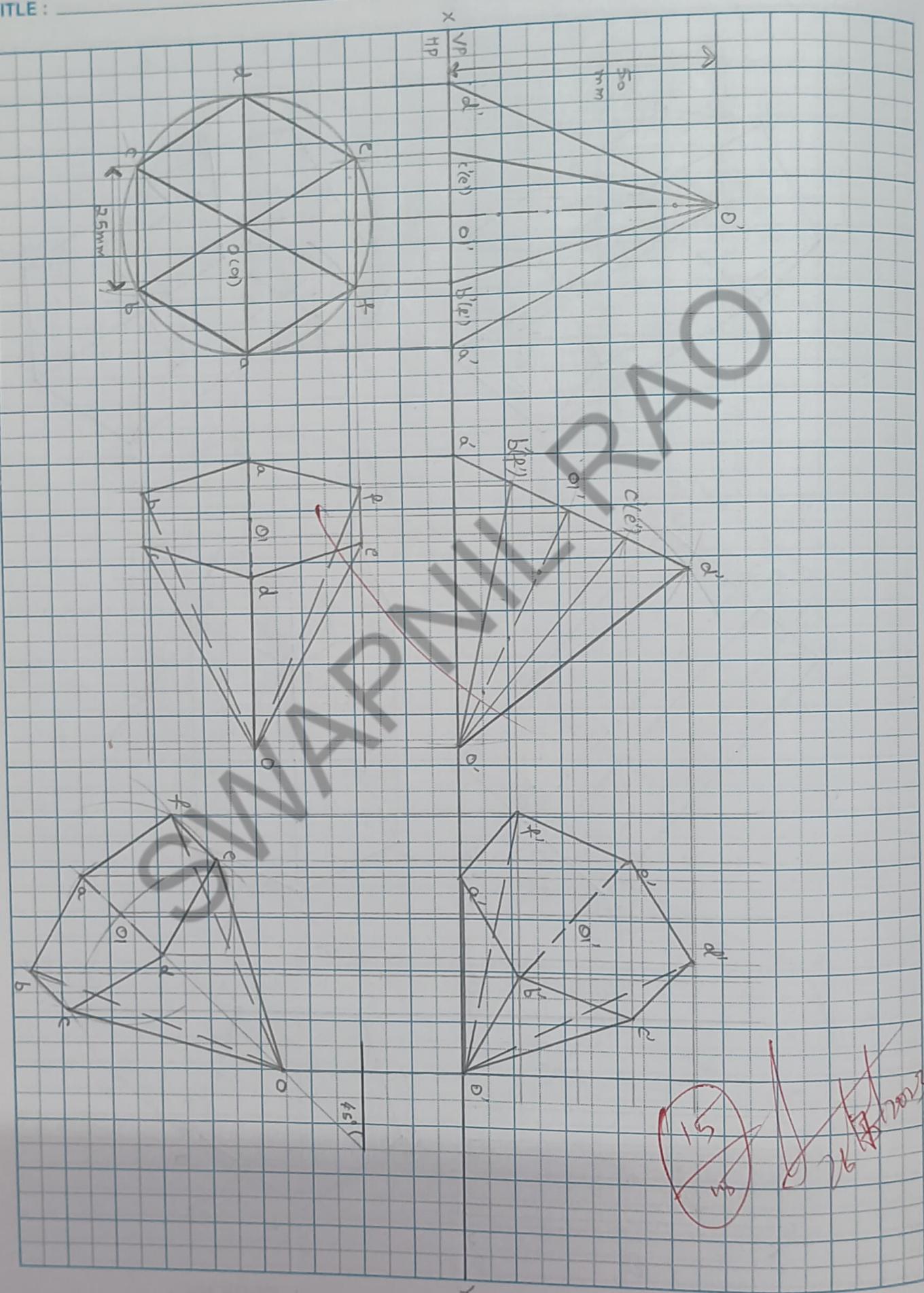
E: _____

SCALE: _____



SCALE : _____

TITLE : _____



ASSIGNMENT :

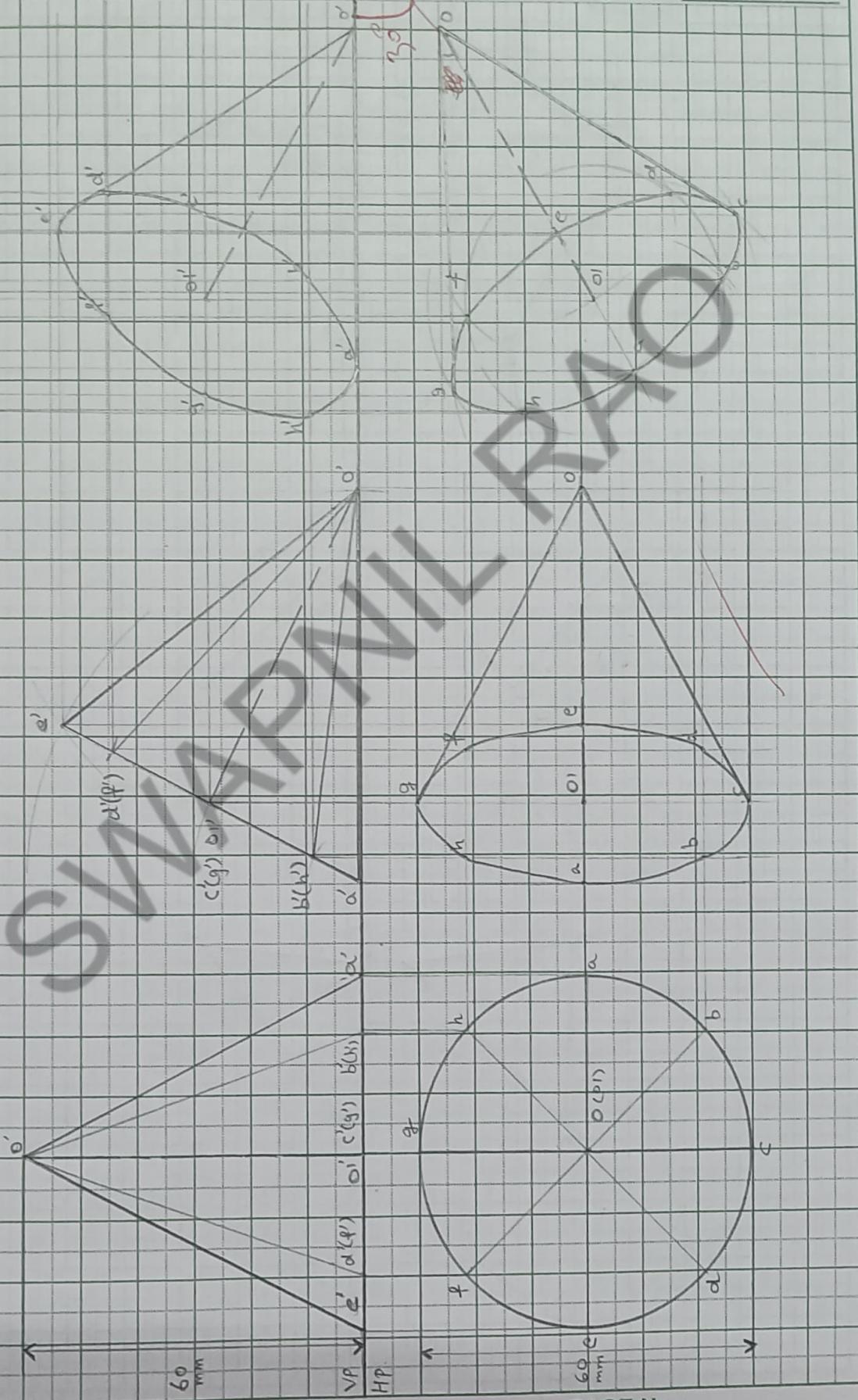
ASSIGNMENT 1

SCALE : _____

Name : _____

USN : _____

Signature: _____



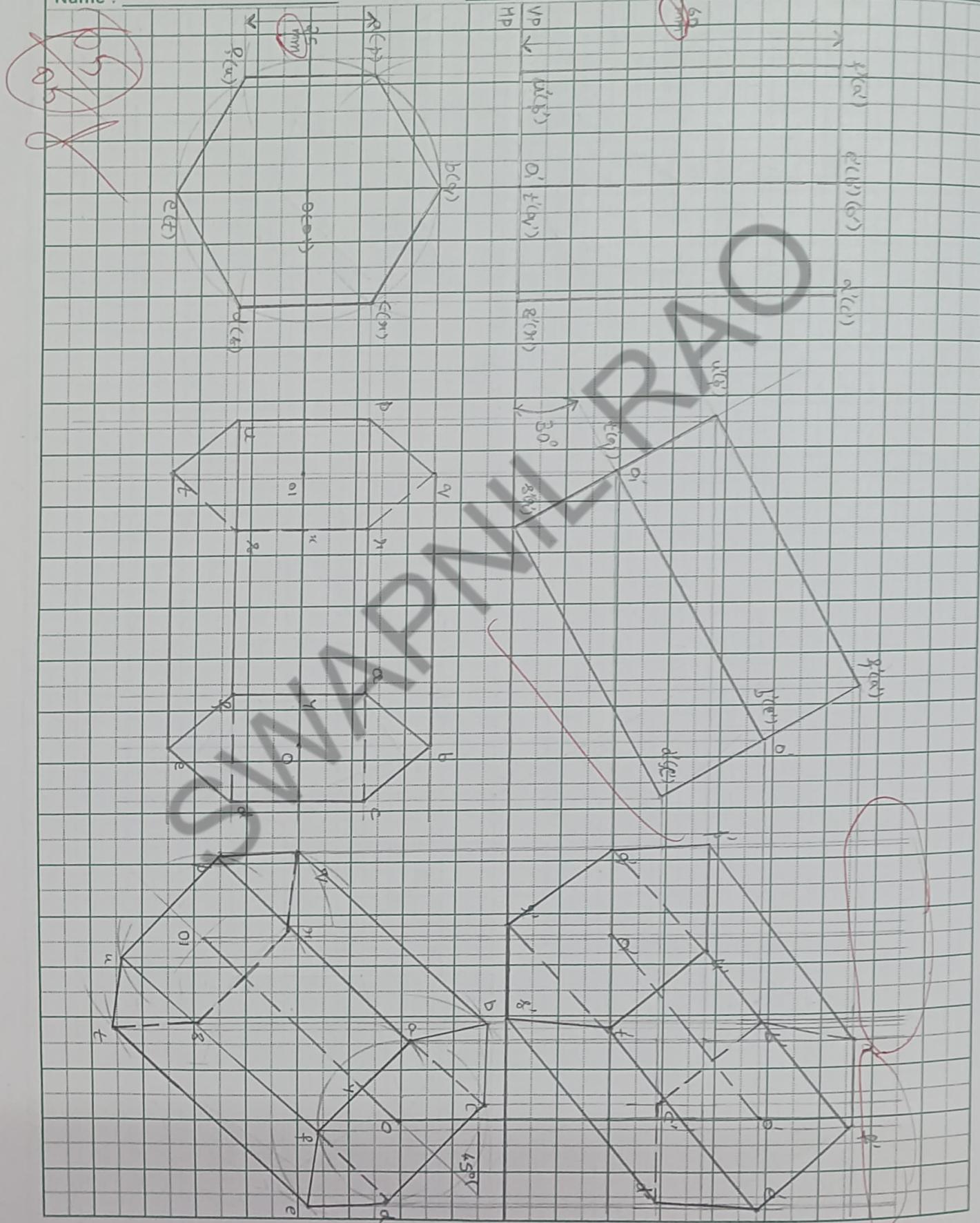
ASSIGNMENT : _____

SCALE : _____

Signature: _____

Name : _____

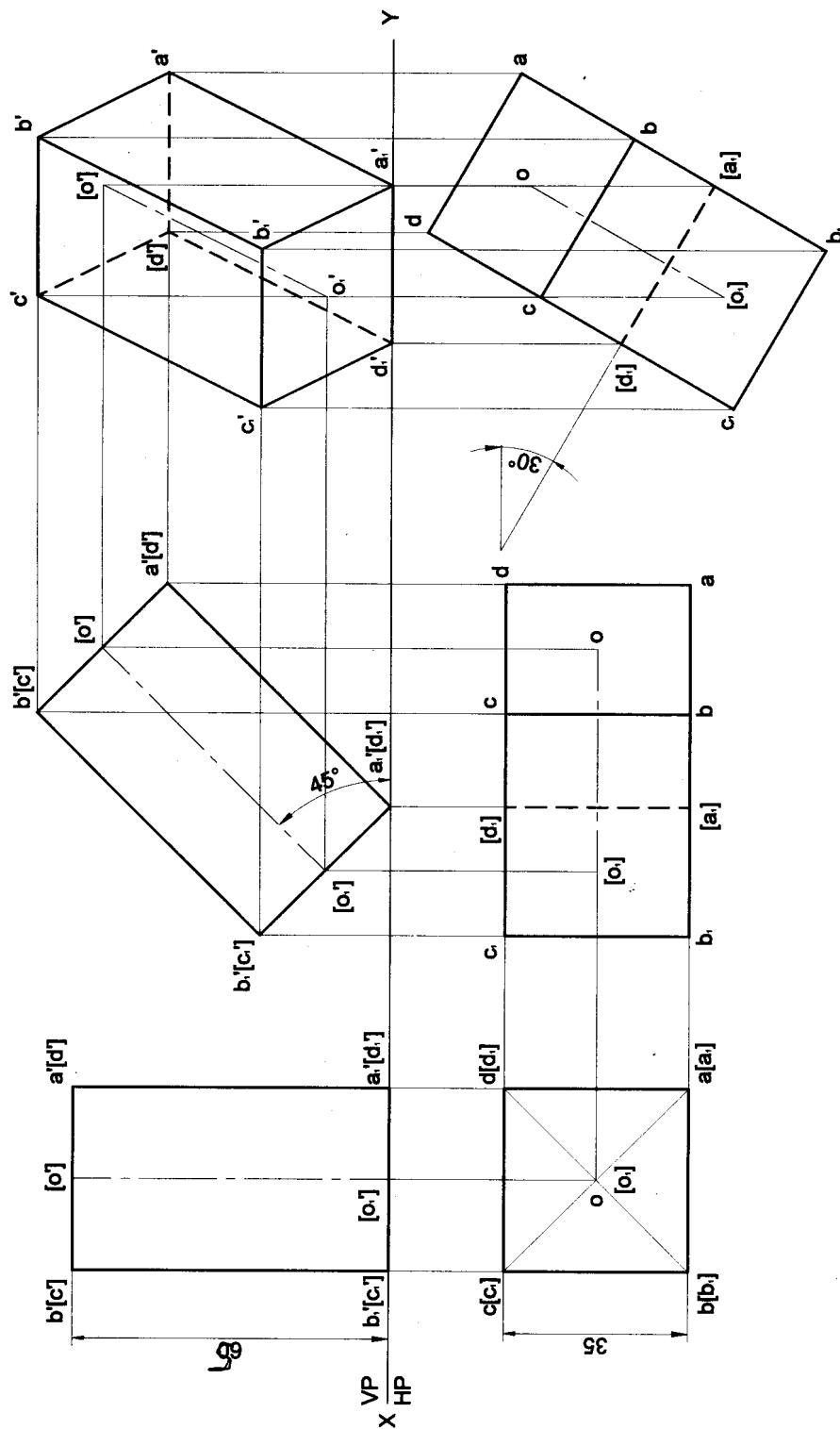
USN : _____



PROJECTIONS OF SOLIDS

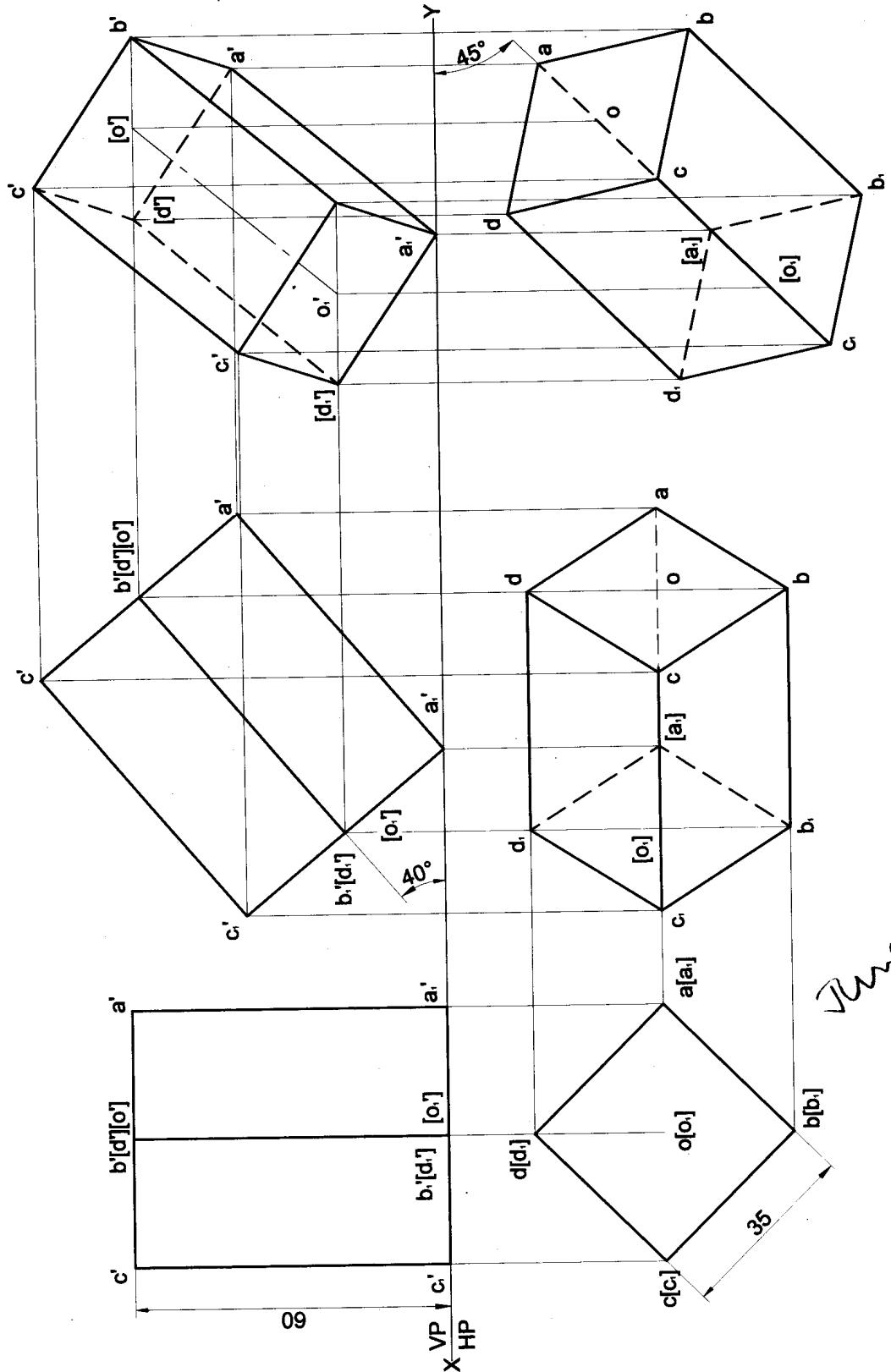
Problem 1 A square prism 35 mm sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the prism when the axis is inclined to HP at 45° .

Solution



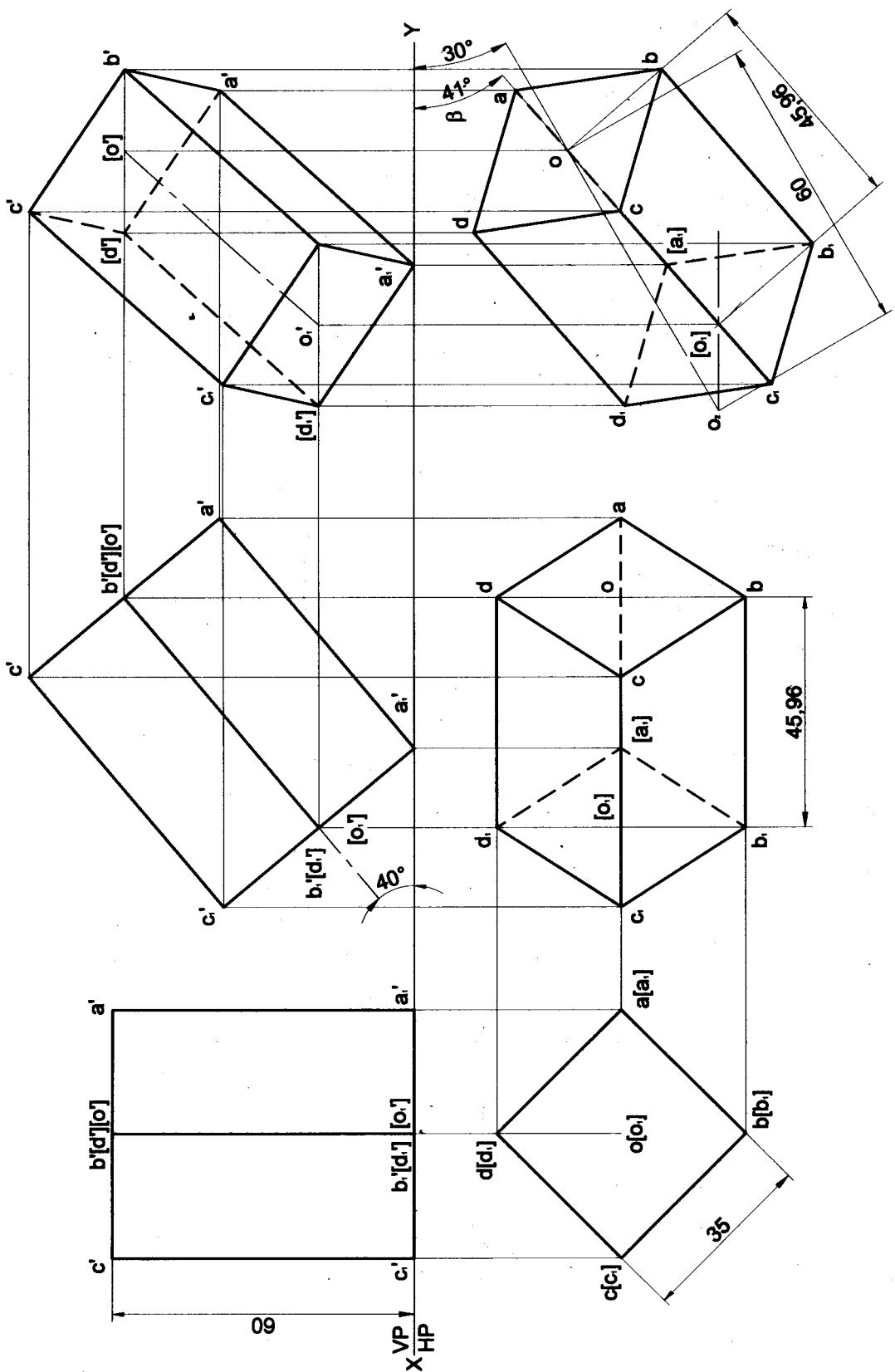
Problem 2 A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and appears to be inclined to VP at 45° .

Solution



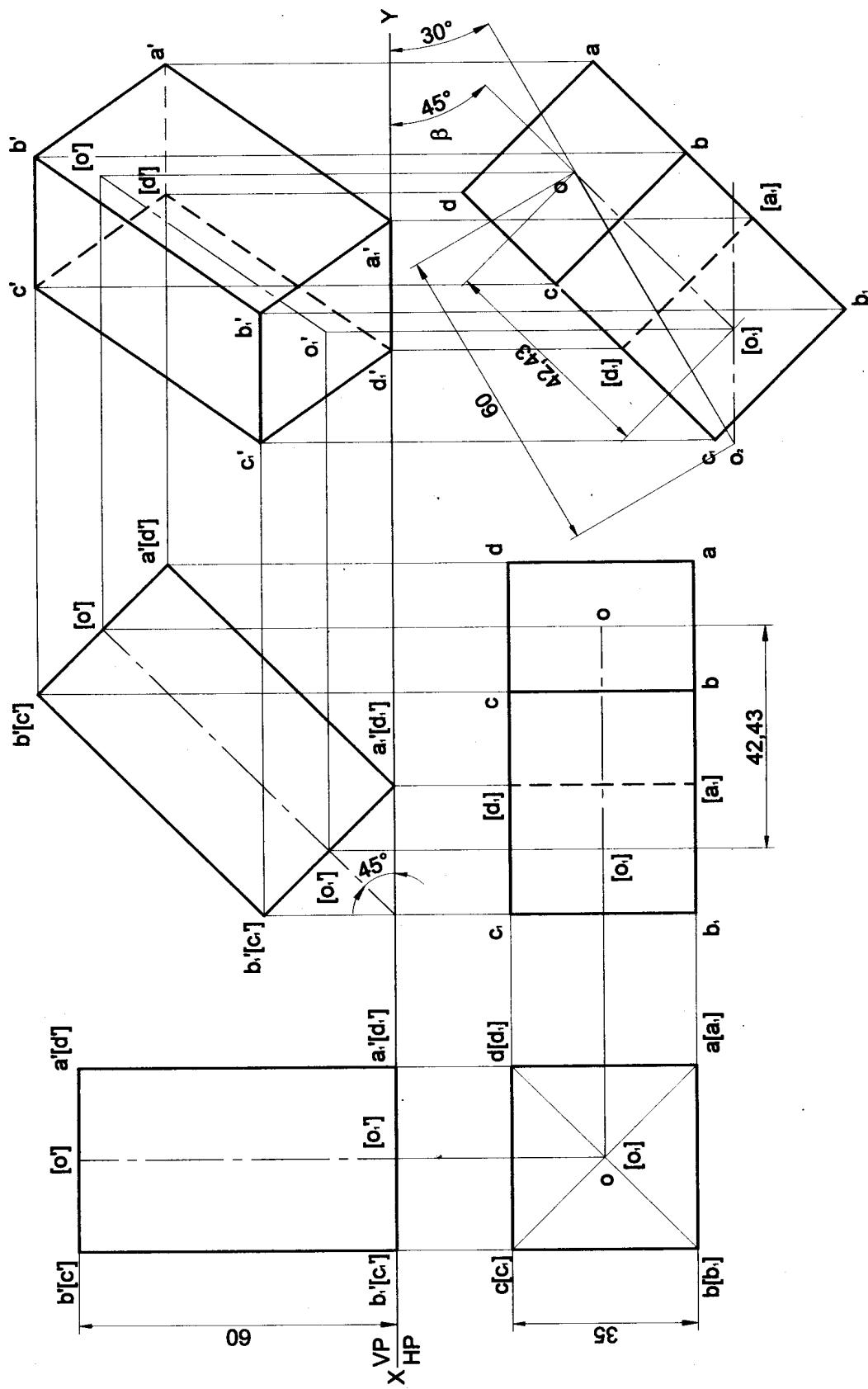
Problem 3 A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and to VP at 30° .

Solution



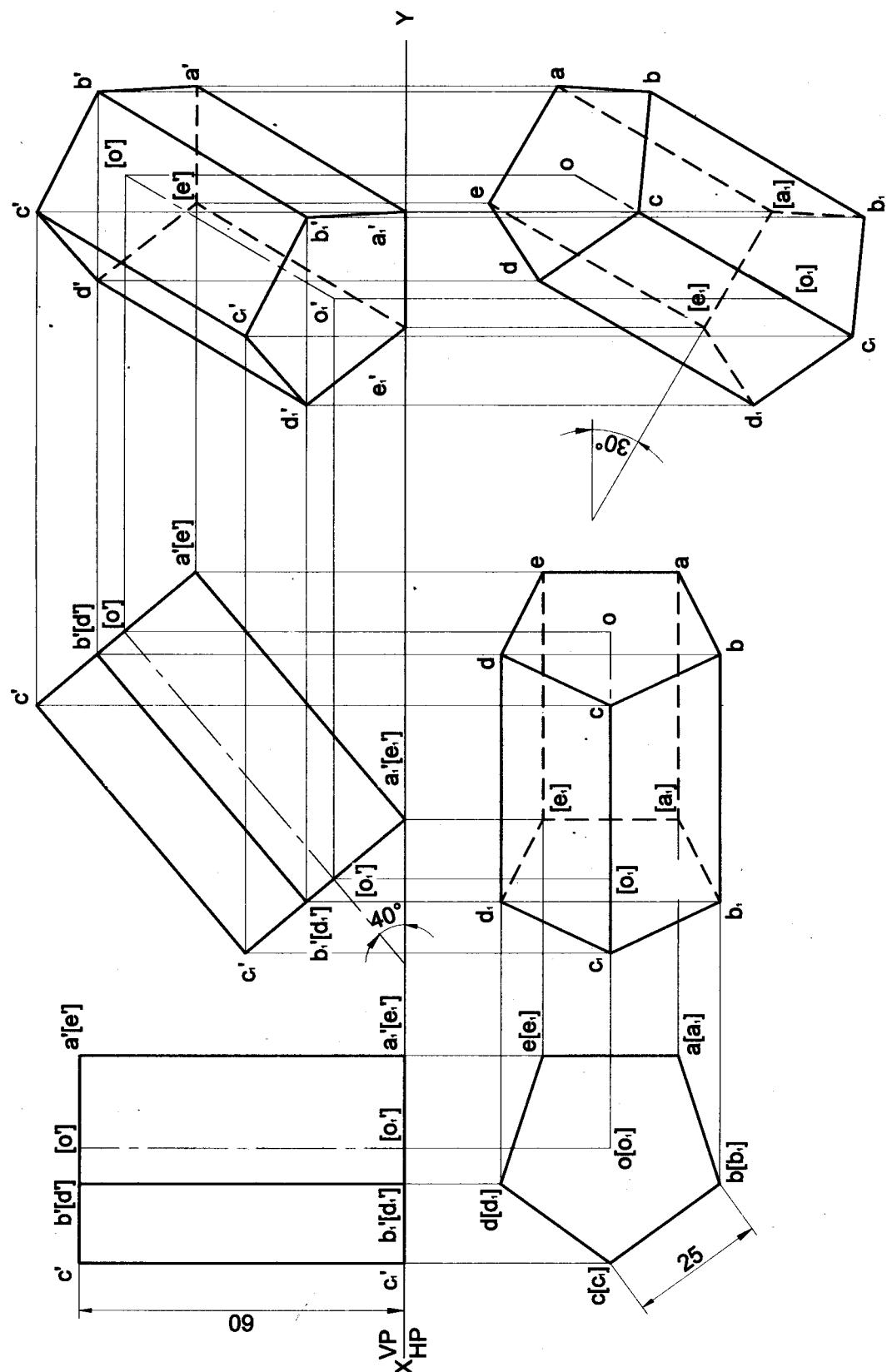
Problem 4 A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 45° and VP at 30° .

Solution



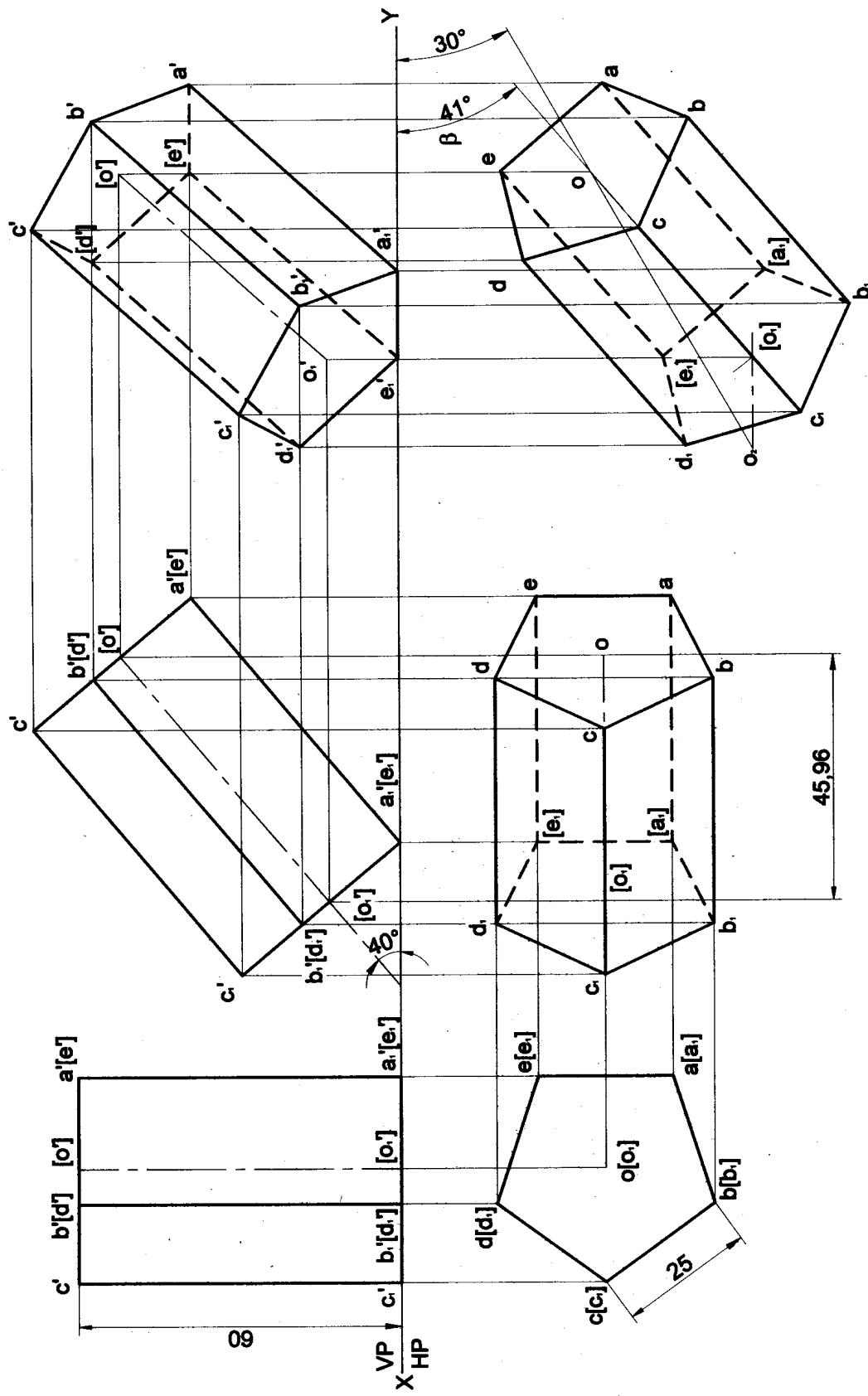
Problem 5 A pentagonal prism 25 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the prism when the axis is inclined to HP at 40° .

Solution



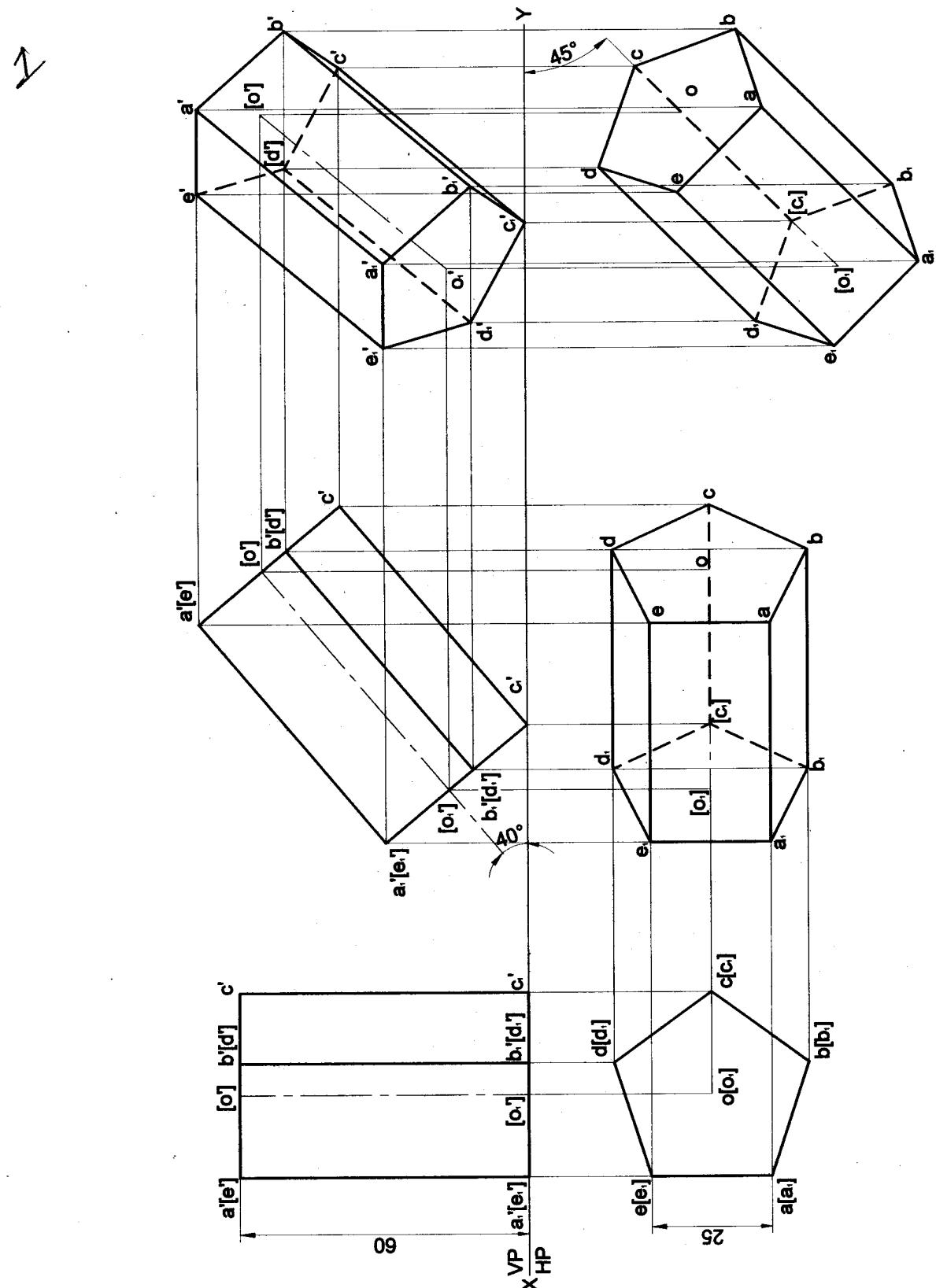
Problem 6 A pentagonal prism 25 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 40° and VP at 30° .

Solution



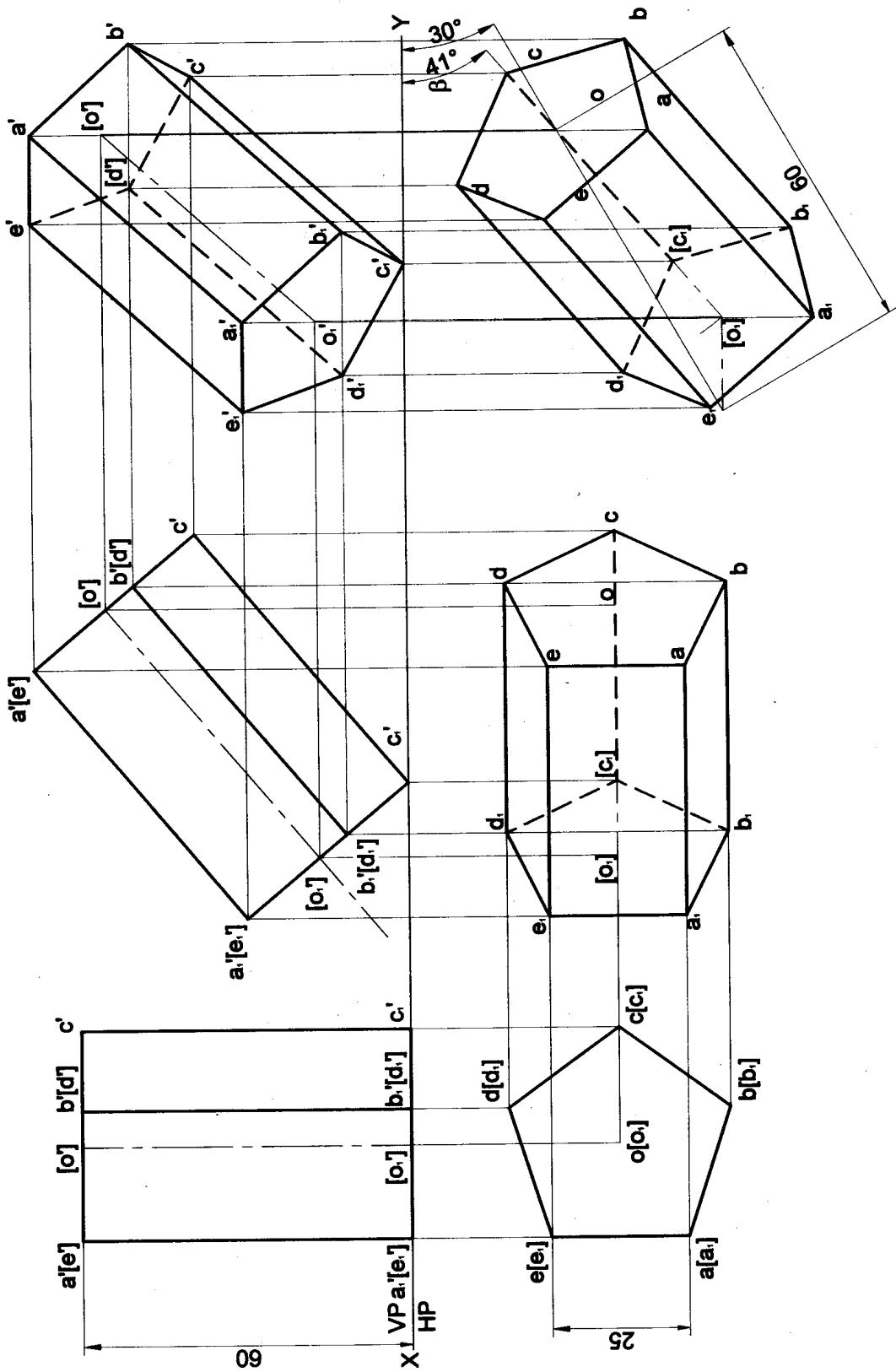
Problem 7 A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and appears to be inclined to VP at 45° .

Solution



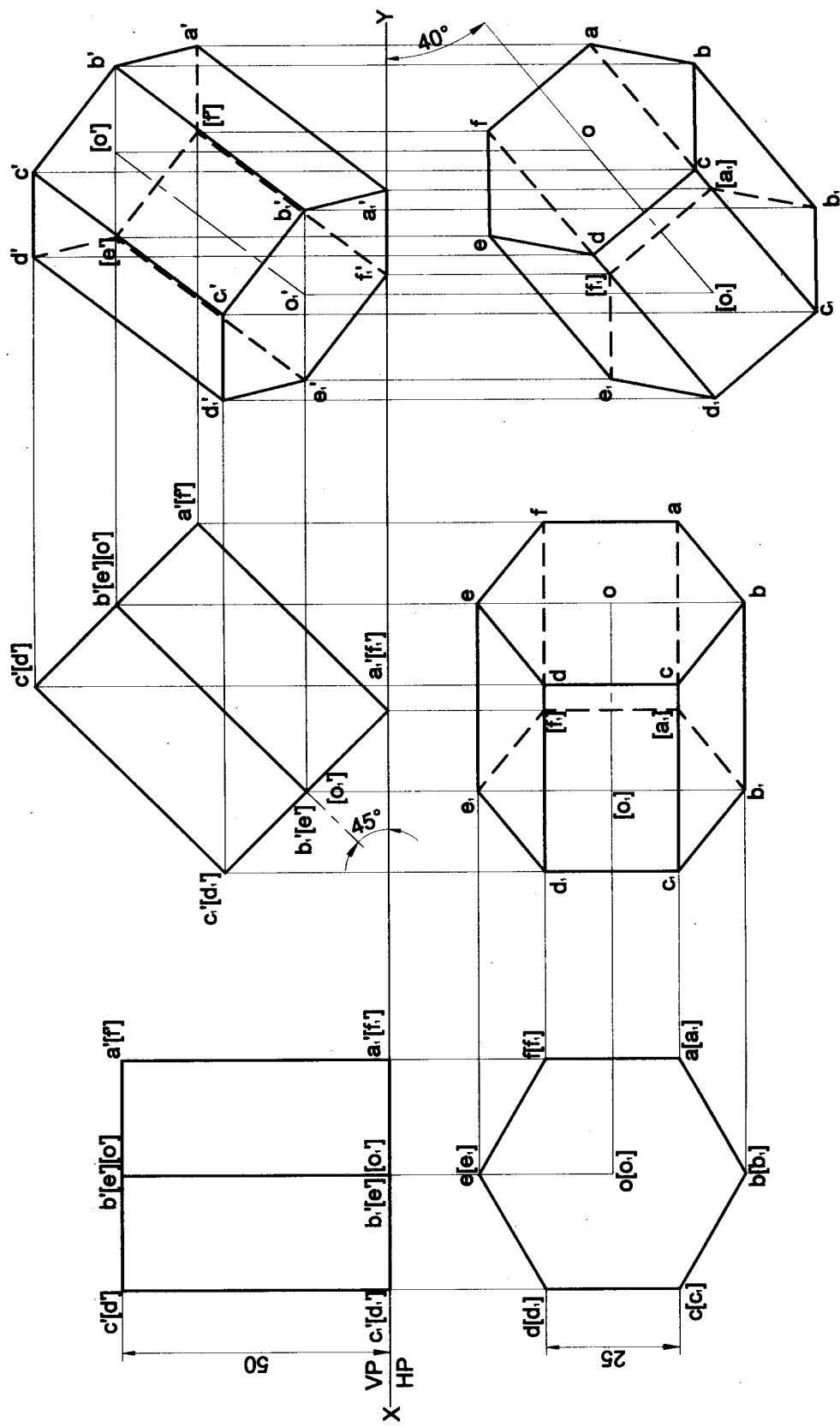
Problem 8 A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and to VP at 30° .

Solution



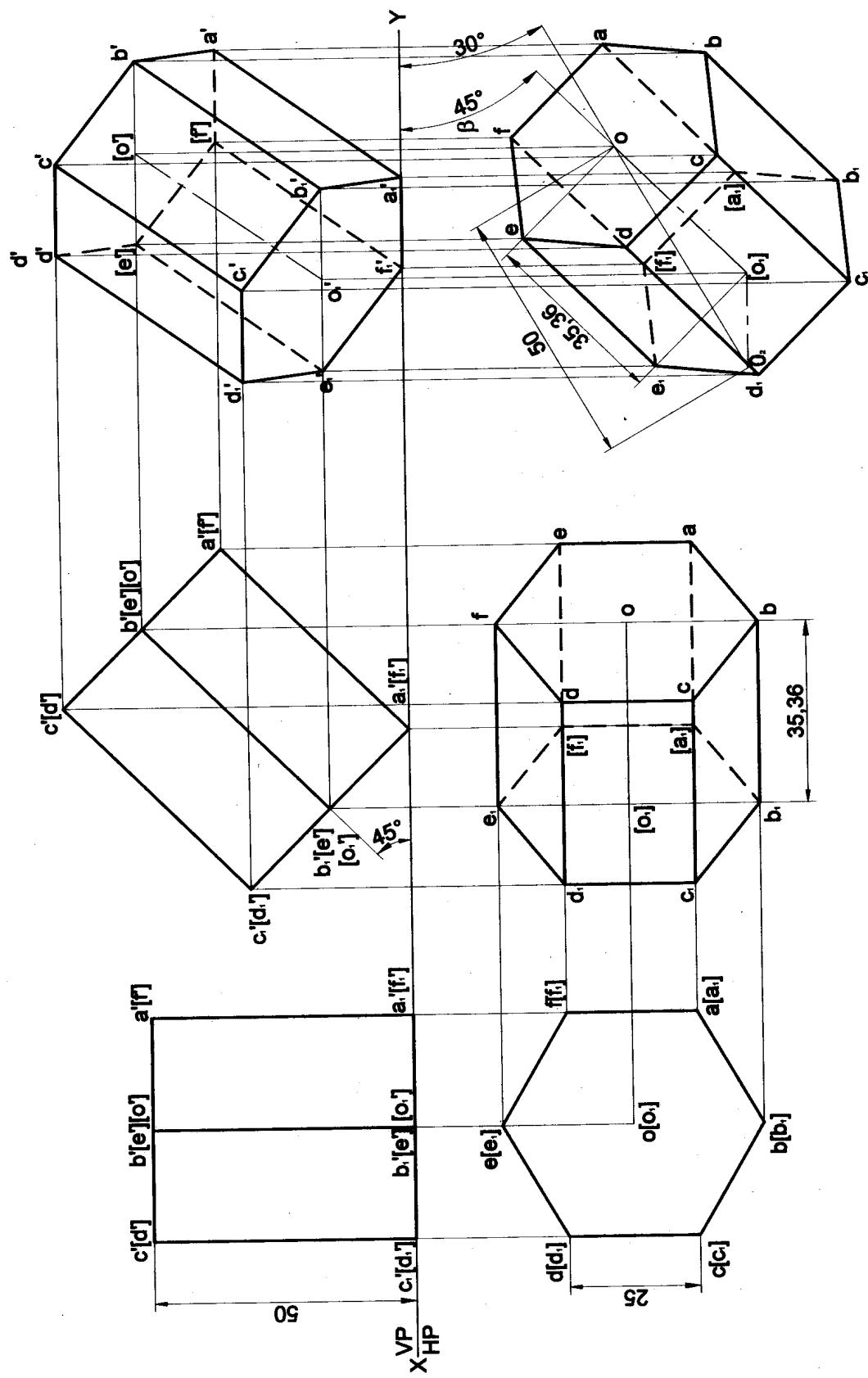
Problem 9 A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges. Draw the projections of the prism when the axis is inclined to HP at 45° and appears to be inclined to VP 40° .

Solution



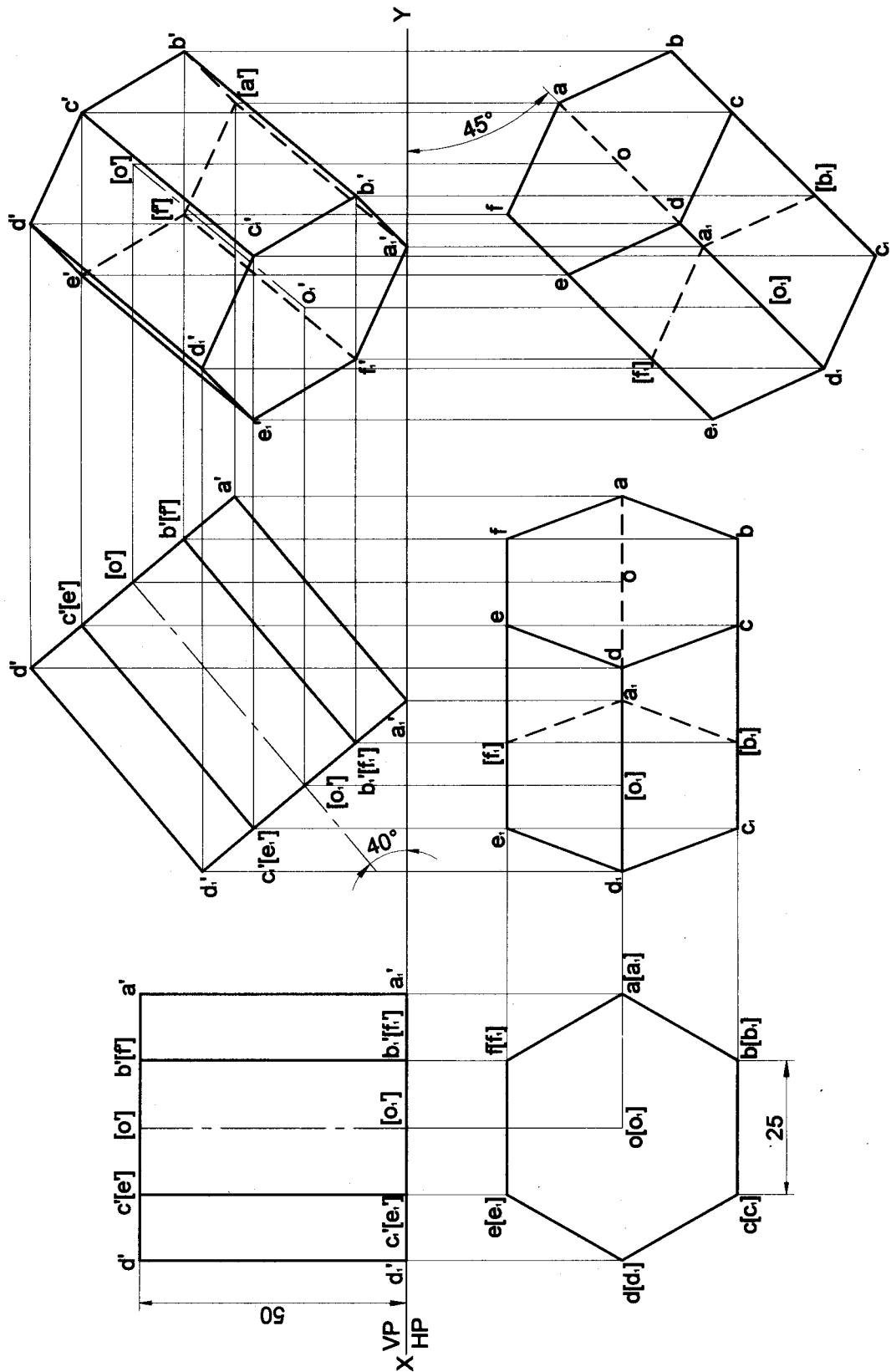
Problem 10 A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 45° and VP at 30° .

Solution



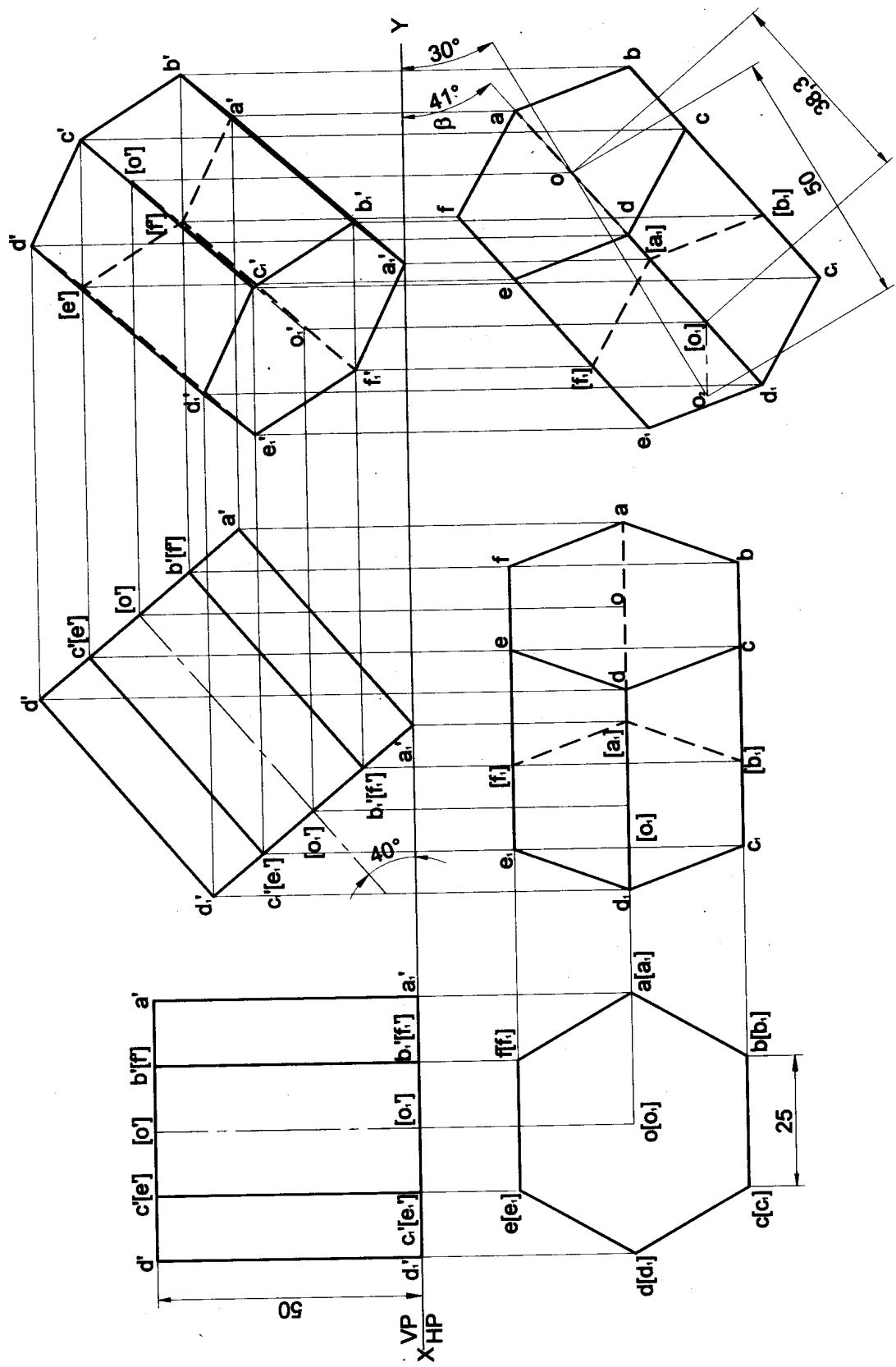
Problem 11 A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and appears to be inclined to VP at 45° .

Solution



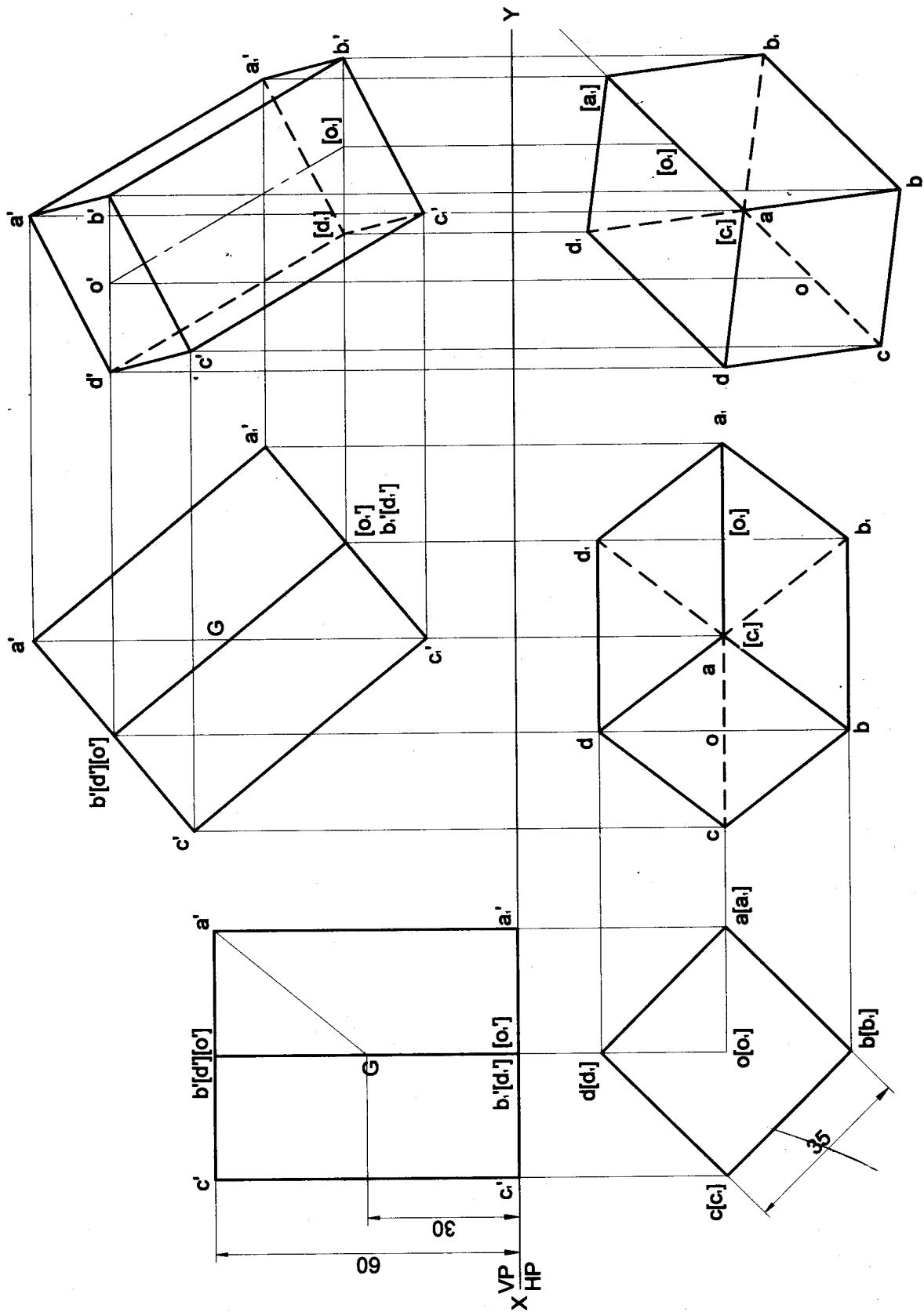
Problem 12 A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40° and to VP at 30° .

Solution



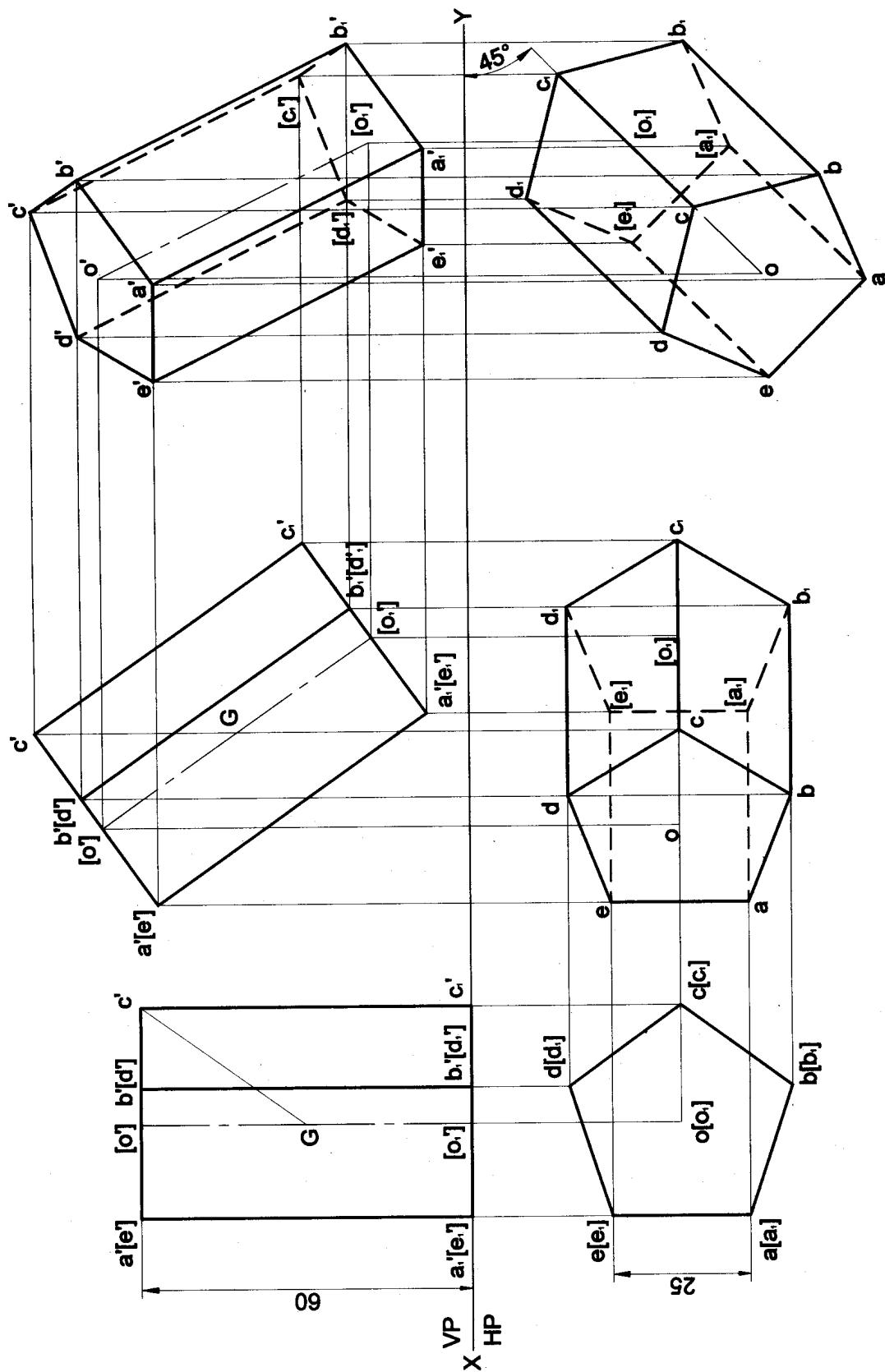
Problem 13 A square prism 35 mm sides of base and 60 mm axis length is suspended freely from a corner of its base. Draw the projections of the prism when the axis appears to be inclined to VP at 45° .

Solution



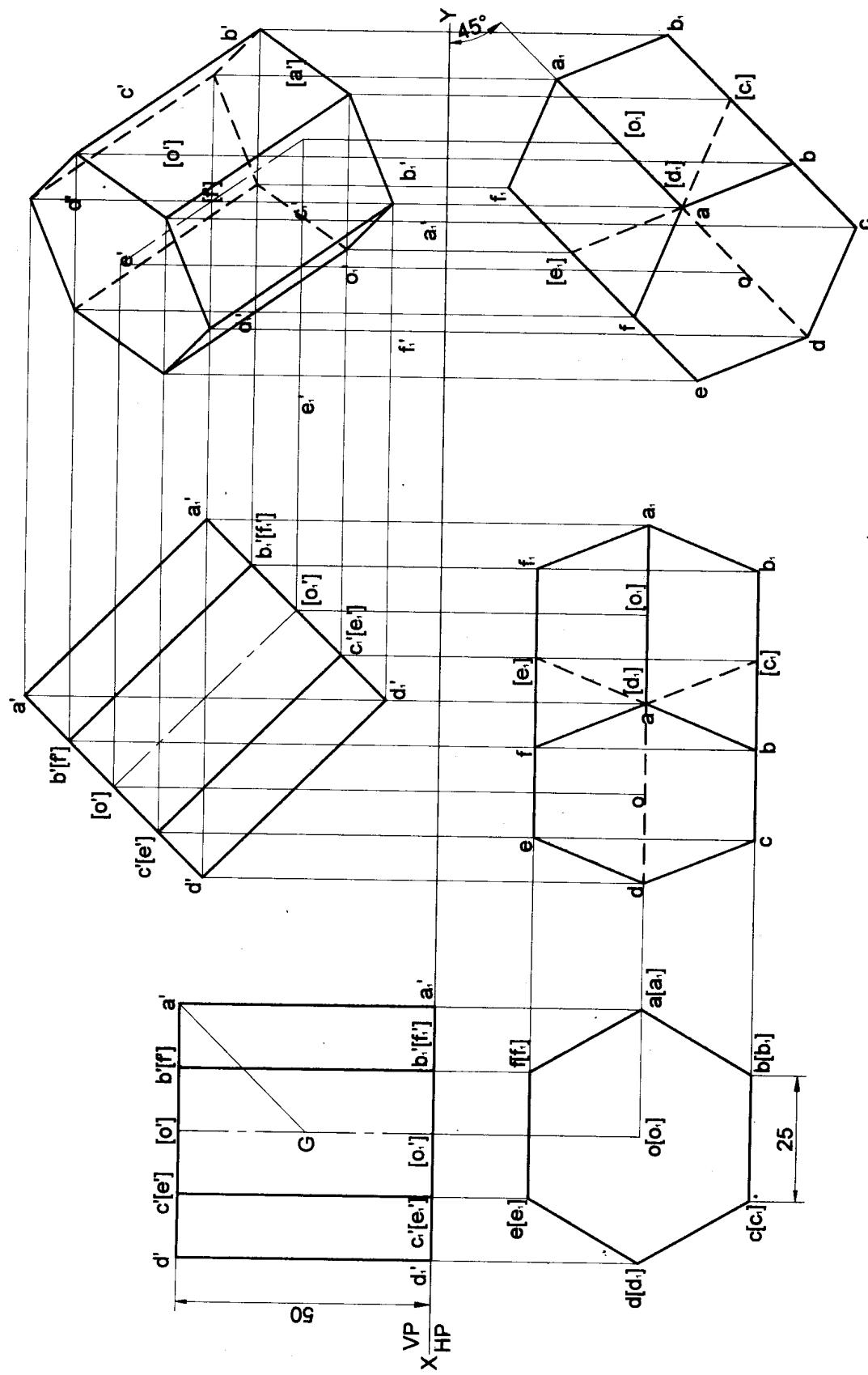
Problem 14 A pentagonal prism 25 mm sides of base and 50 mm axis length is suspended freely from a corner of its base. Draw the projections of the prism when the axis appears to be inclined to VP at 45° .

Solution



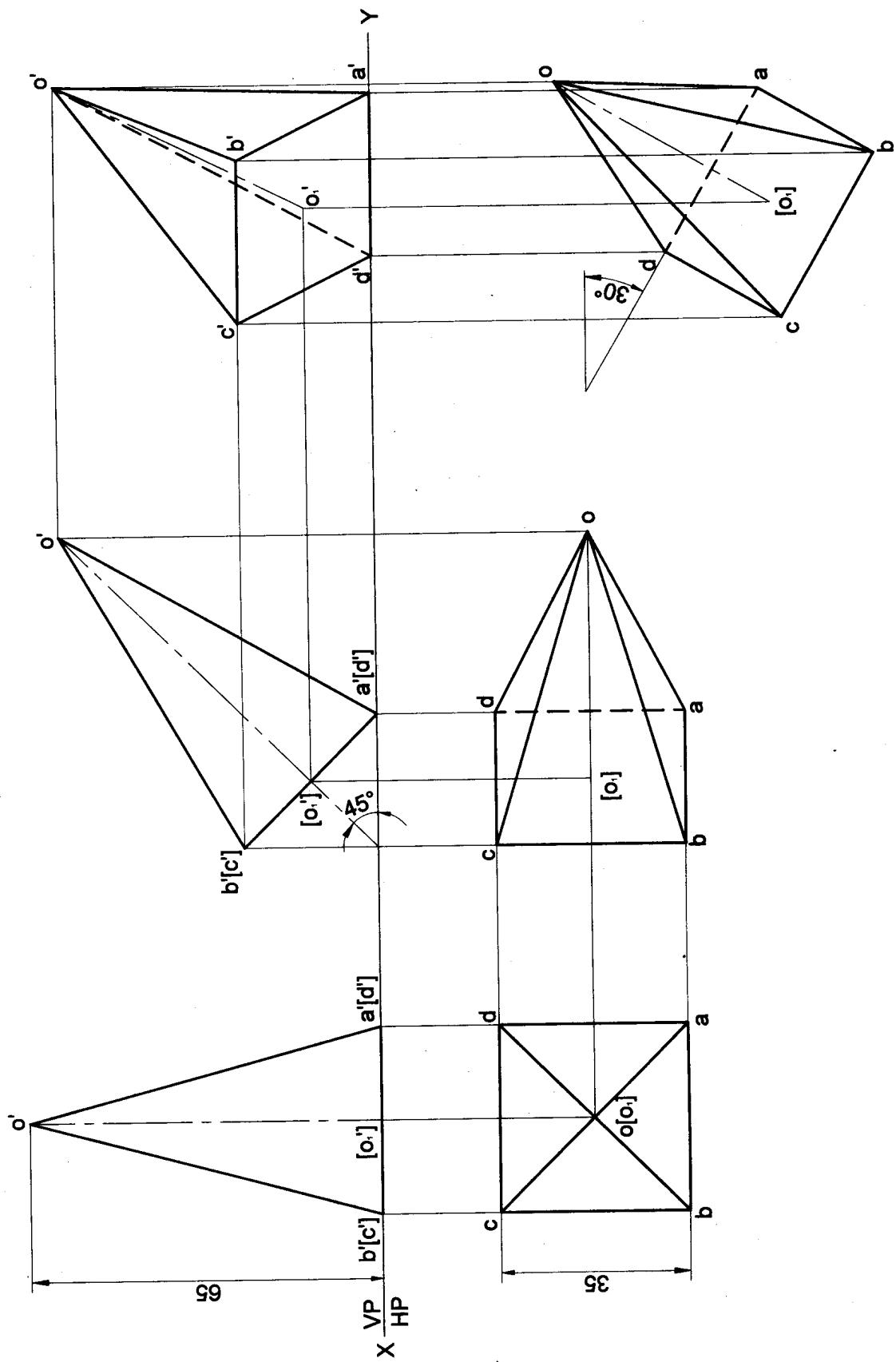
Problem 15 A hexagonal prism 25 mm sides of base and 50 mm axis length is suspended freely from a corner of its base. Draw the projections of the prism when the axis appears to be inclined to VP at 45° .

Solution



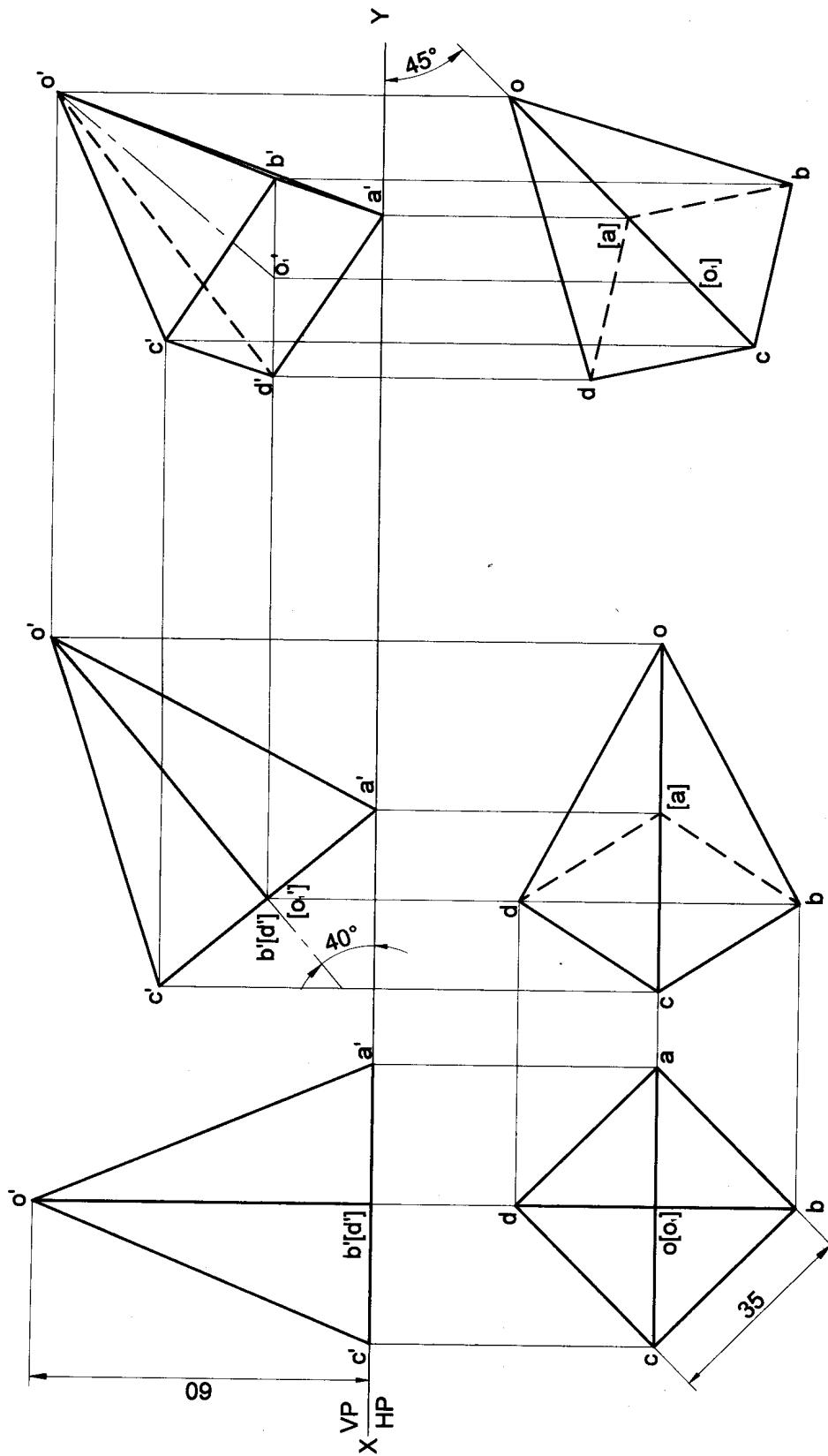
Problem 16 A square pyramid 35 mm sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the pyramid when the axis is inclined to HP at 45° .

Solution



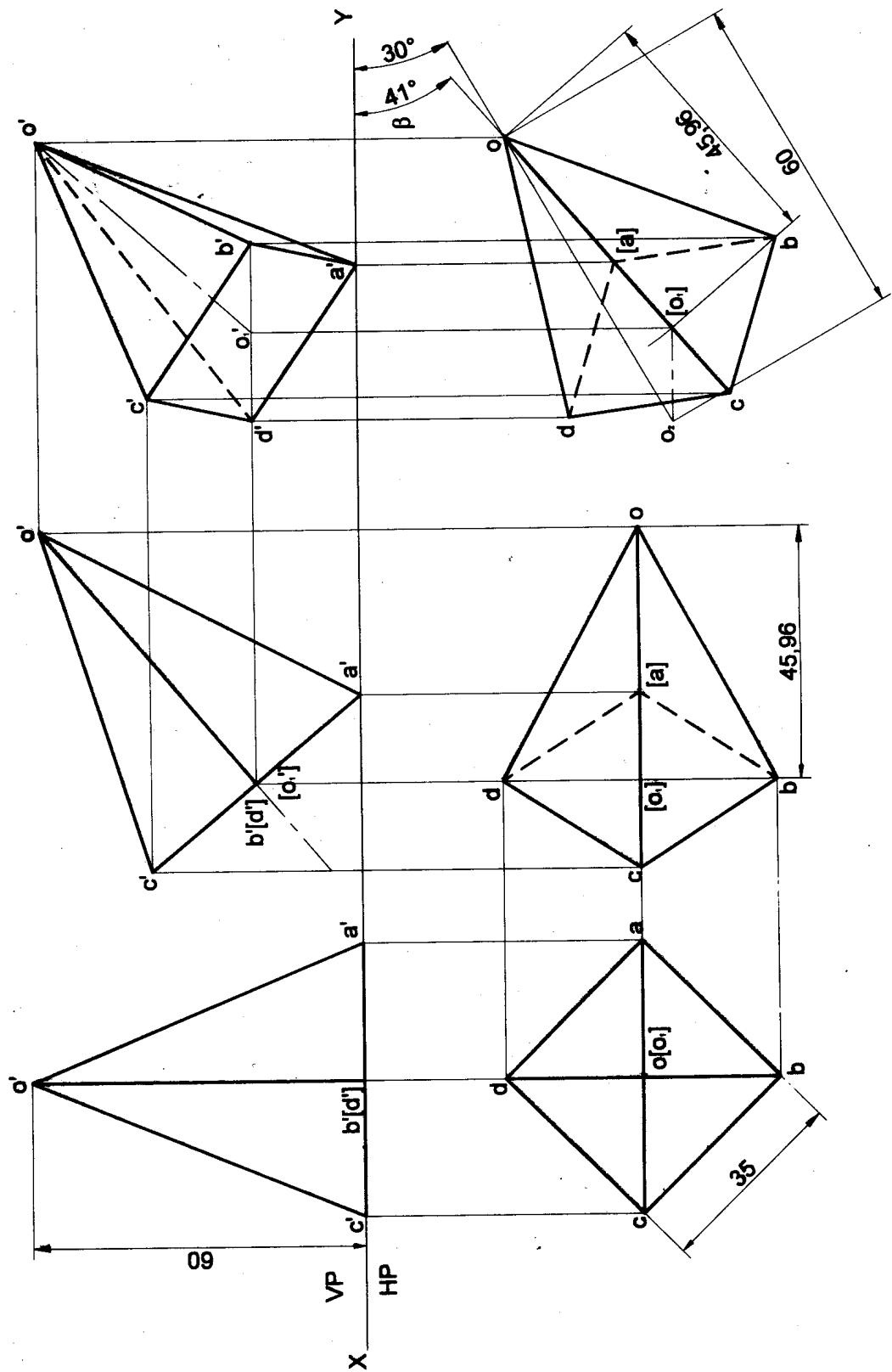
Problem 17 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and appears to be inclined to VP at 45° .

Solution



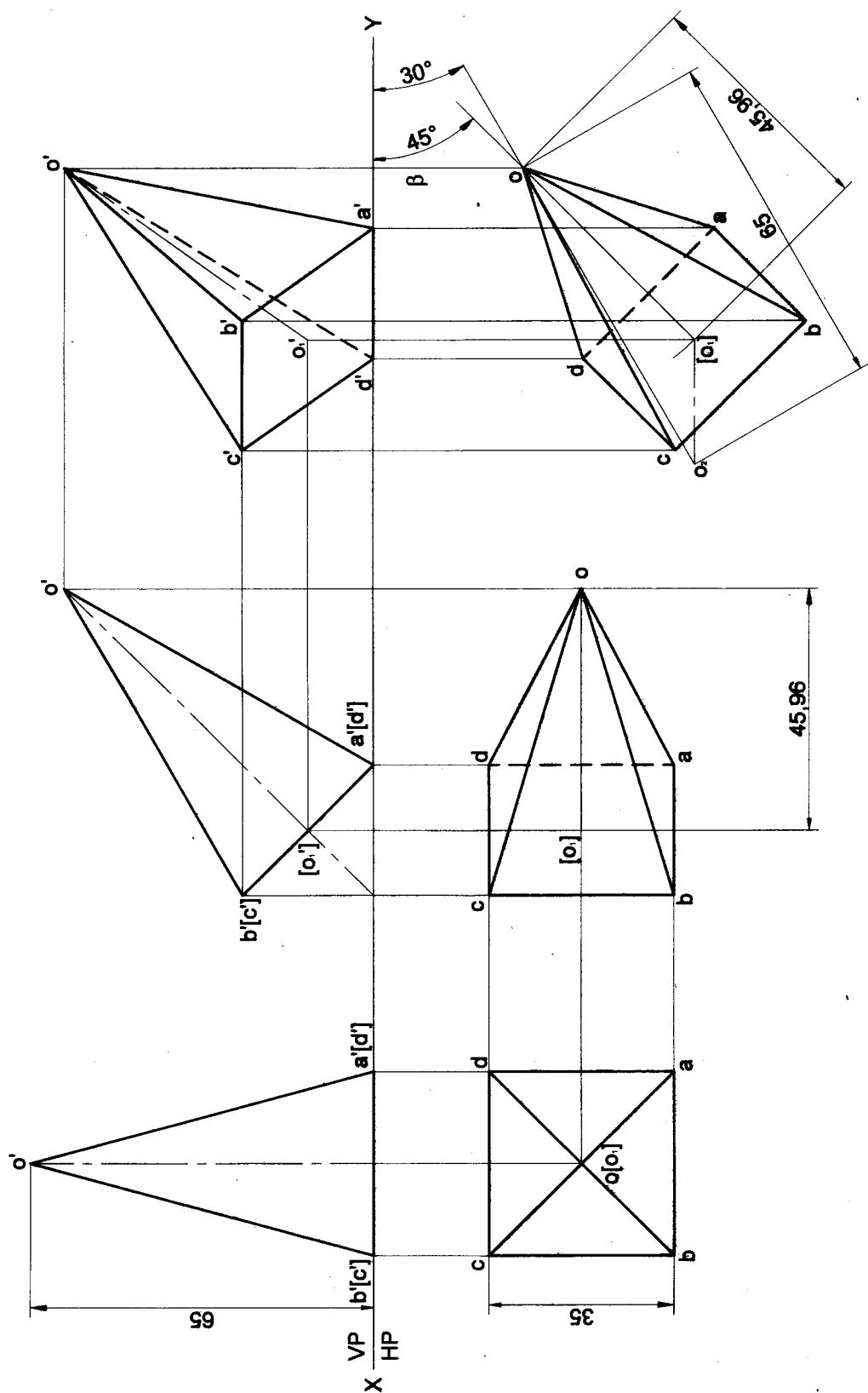
Problem 18 A square-pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and to VP at 30° .

Solution



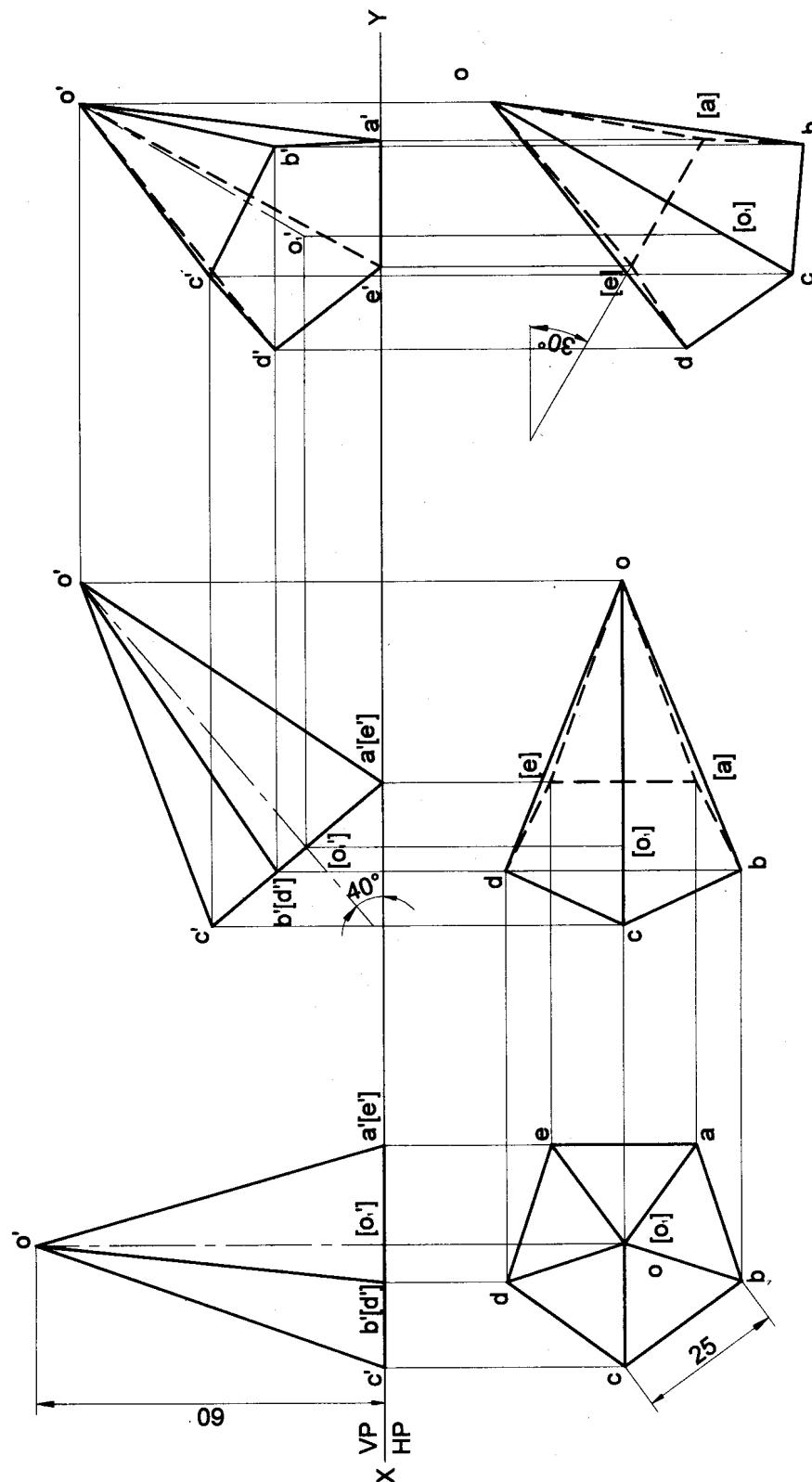
Problem 19 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45° and VP at 30° .

Solution



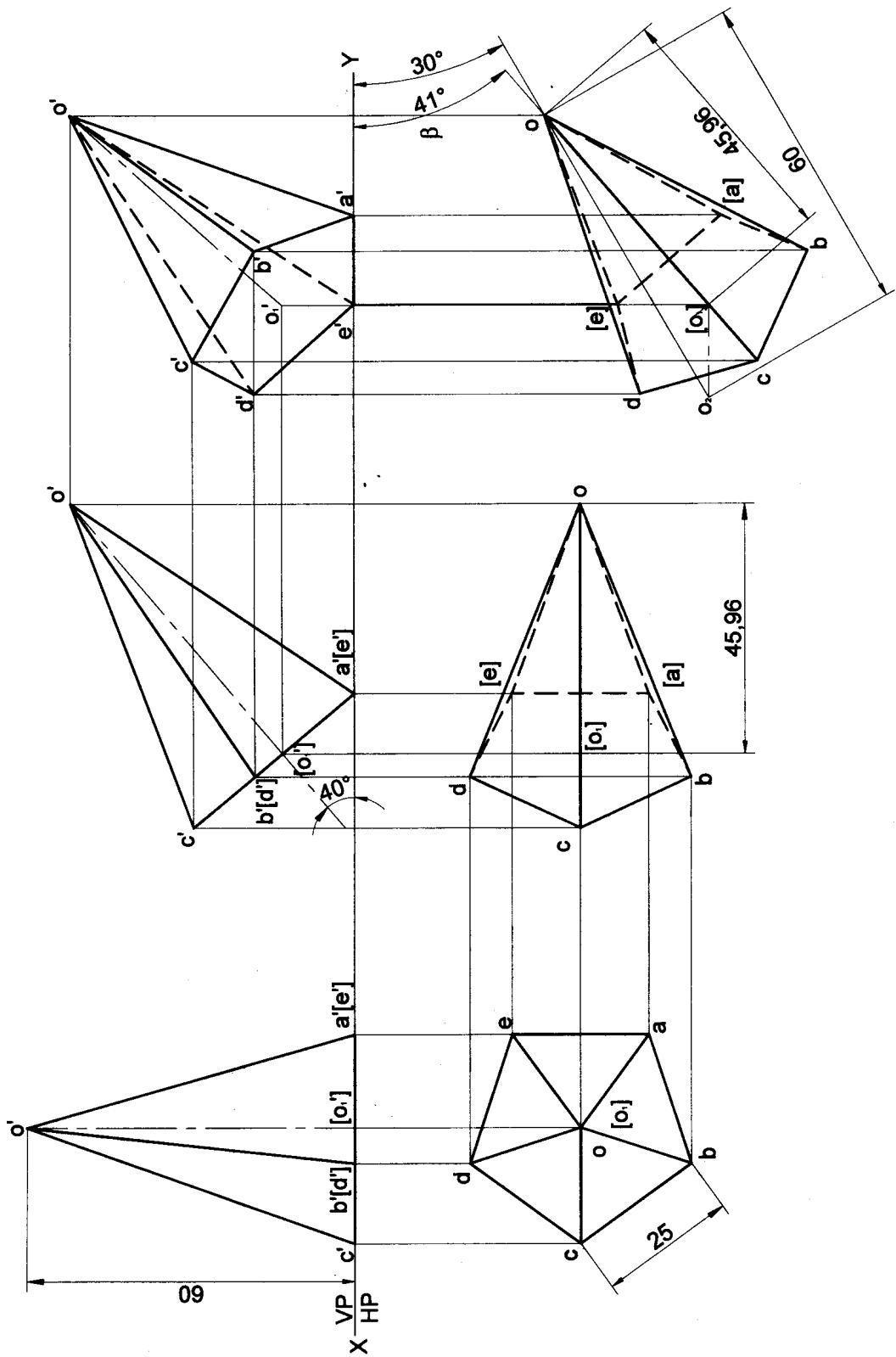
Problem 20 A pentagonal pyramid 25 mm sides of base and 60 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the pyramid when the axis is inclined to HP at 40° .

Solution



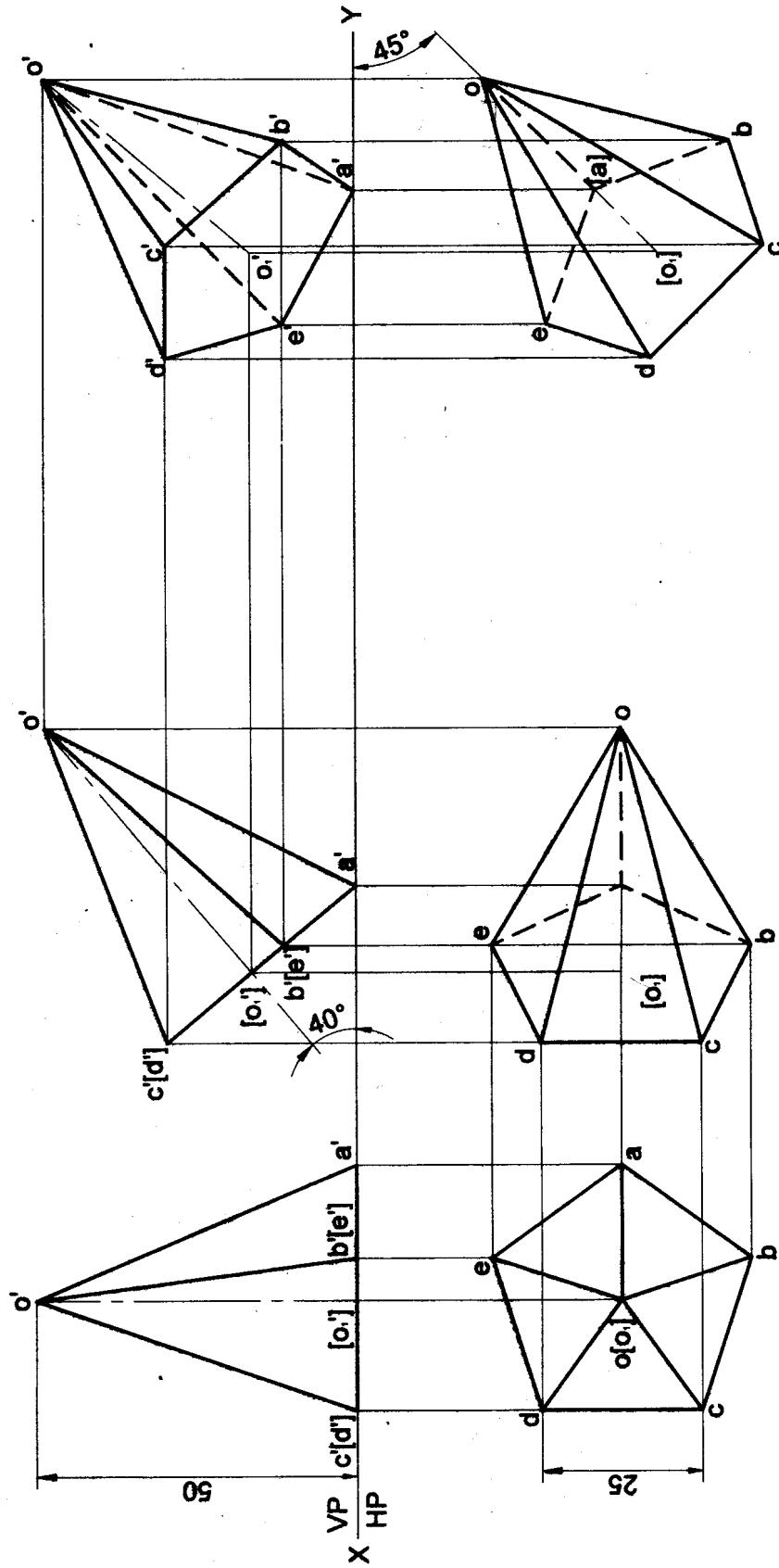
Problem 21 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45° and VP at 30° .

Solution



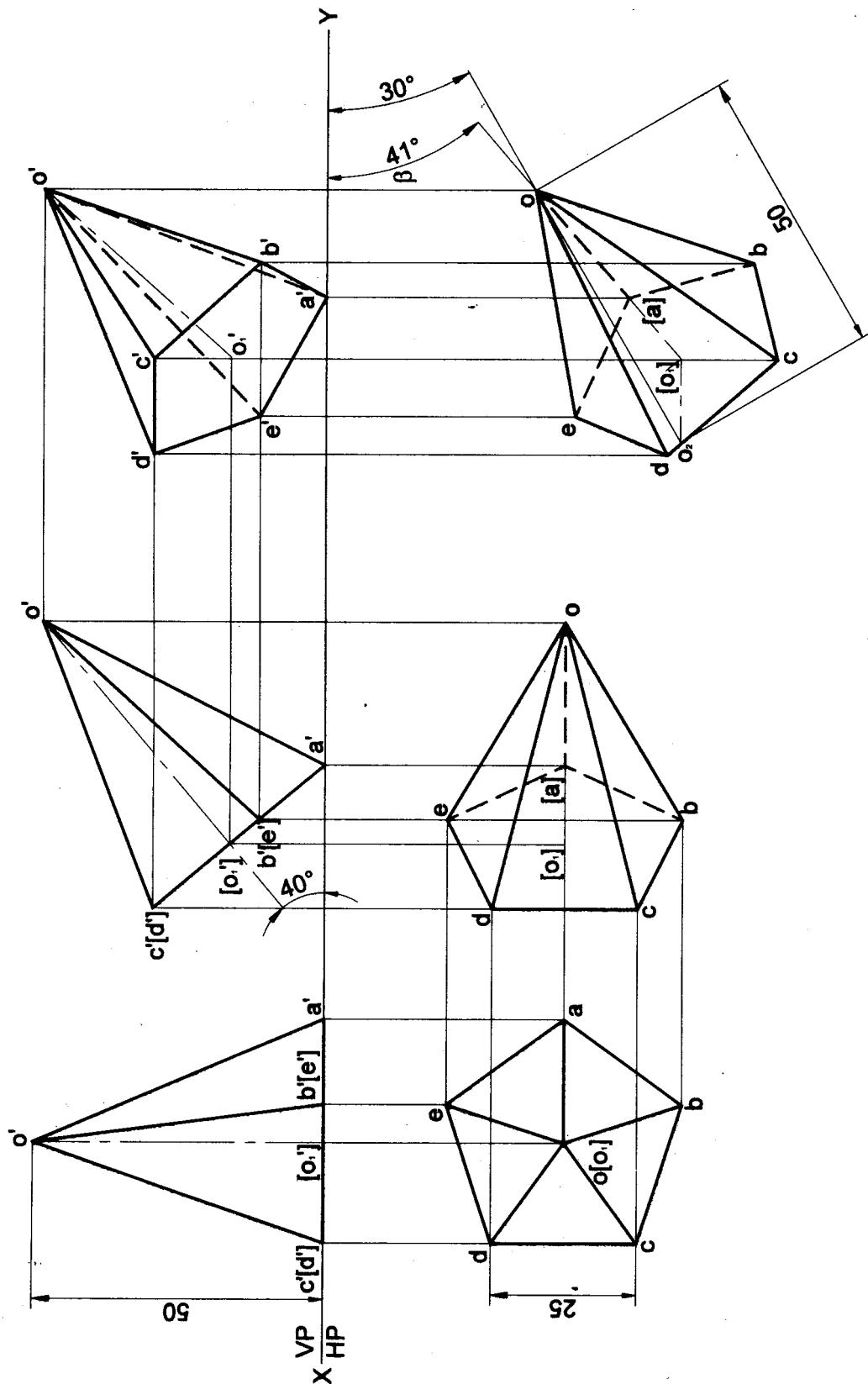
Problem 22 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and appears to be inclined to VP at 45° .

Solution



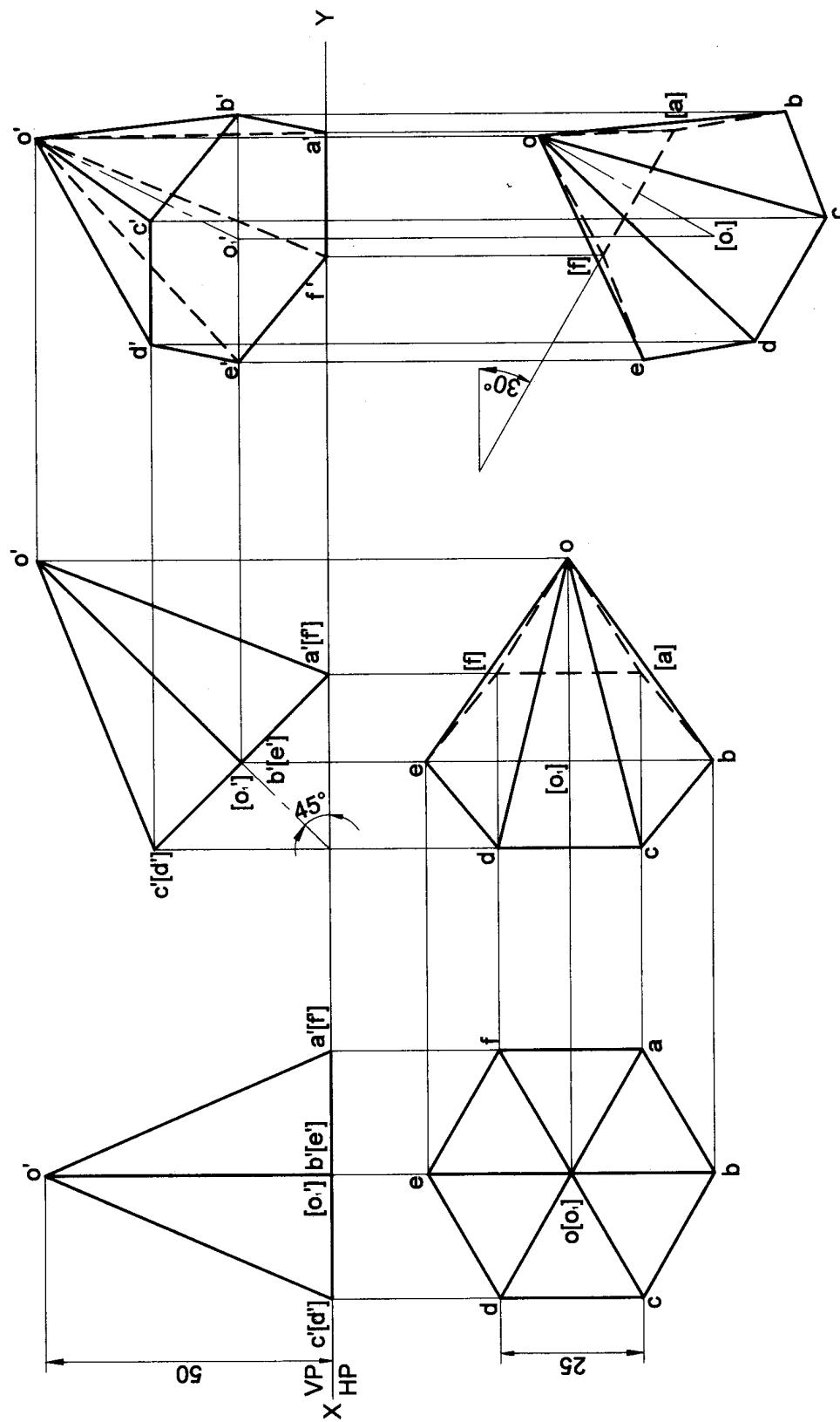
Problem 23 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and to VP at 30° .

Solution



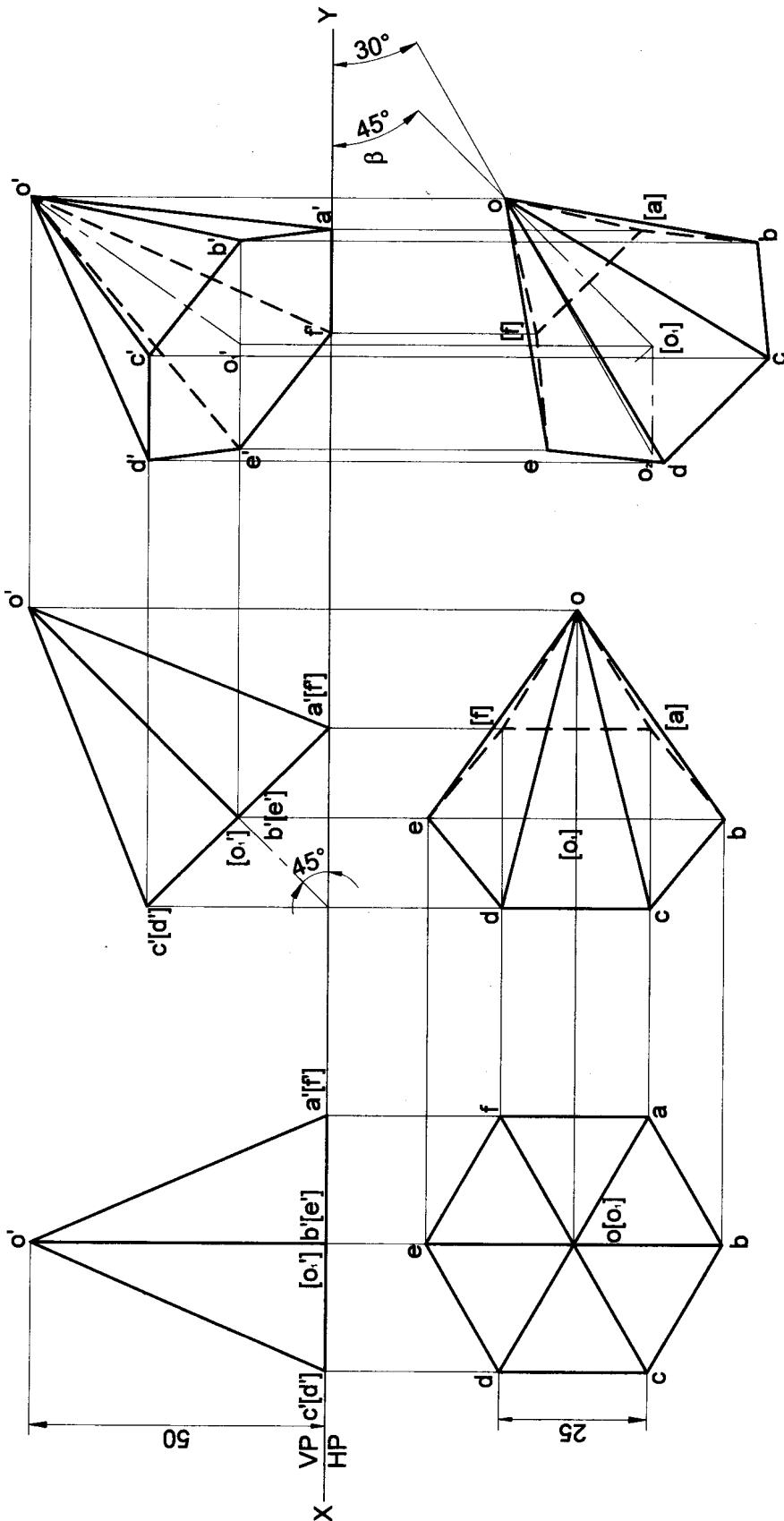
Problem 24 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30° . Draw the projections of the pyramid when the axis is inclined to HP at 45° .

Solution



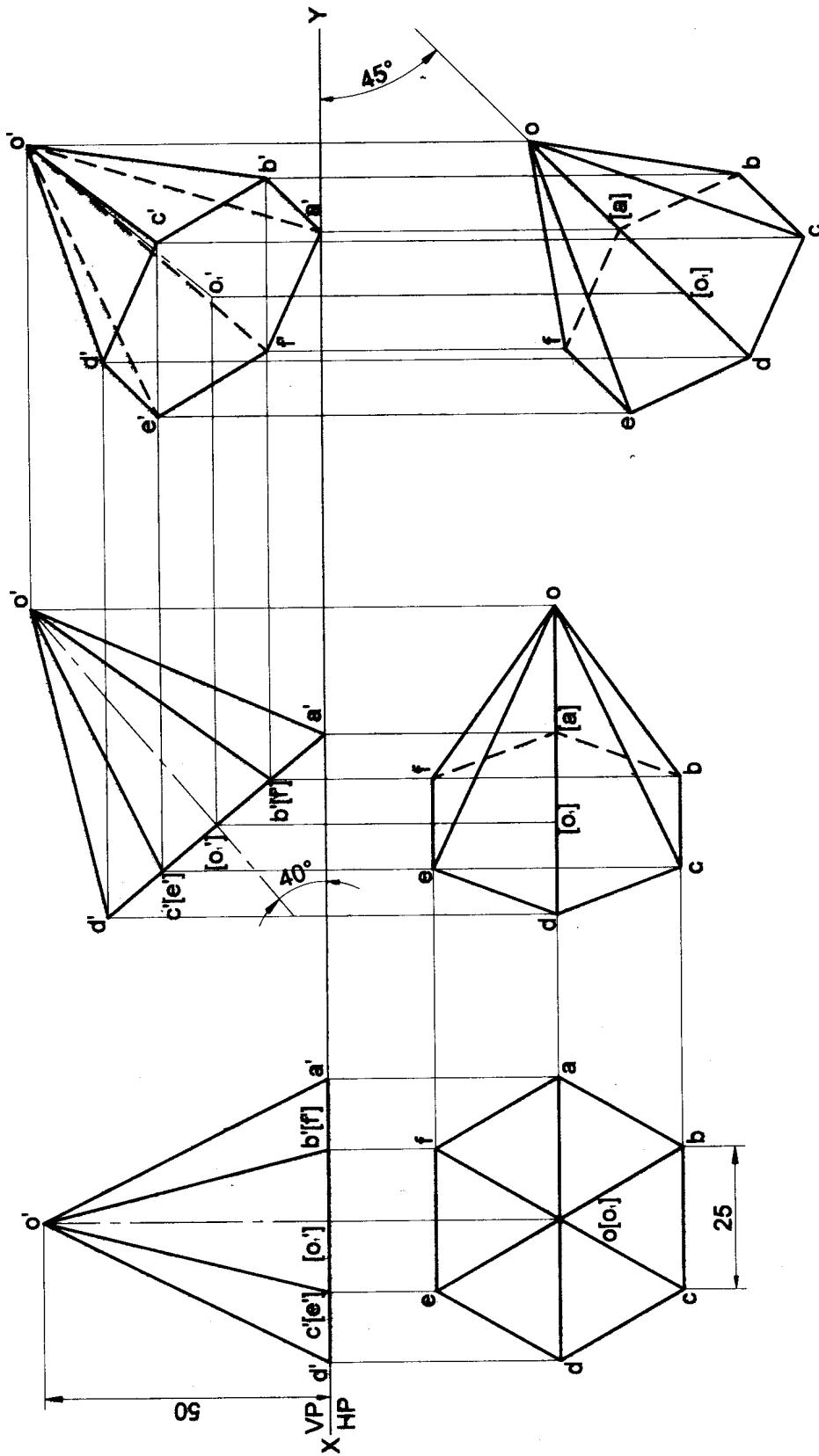
Problem 25 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45° and VP at 30° .

Solution



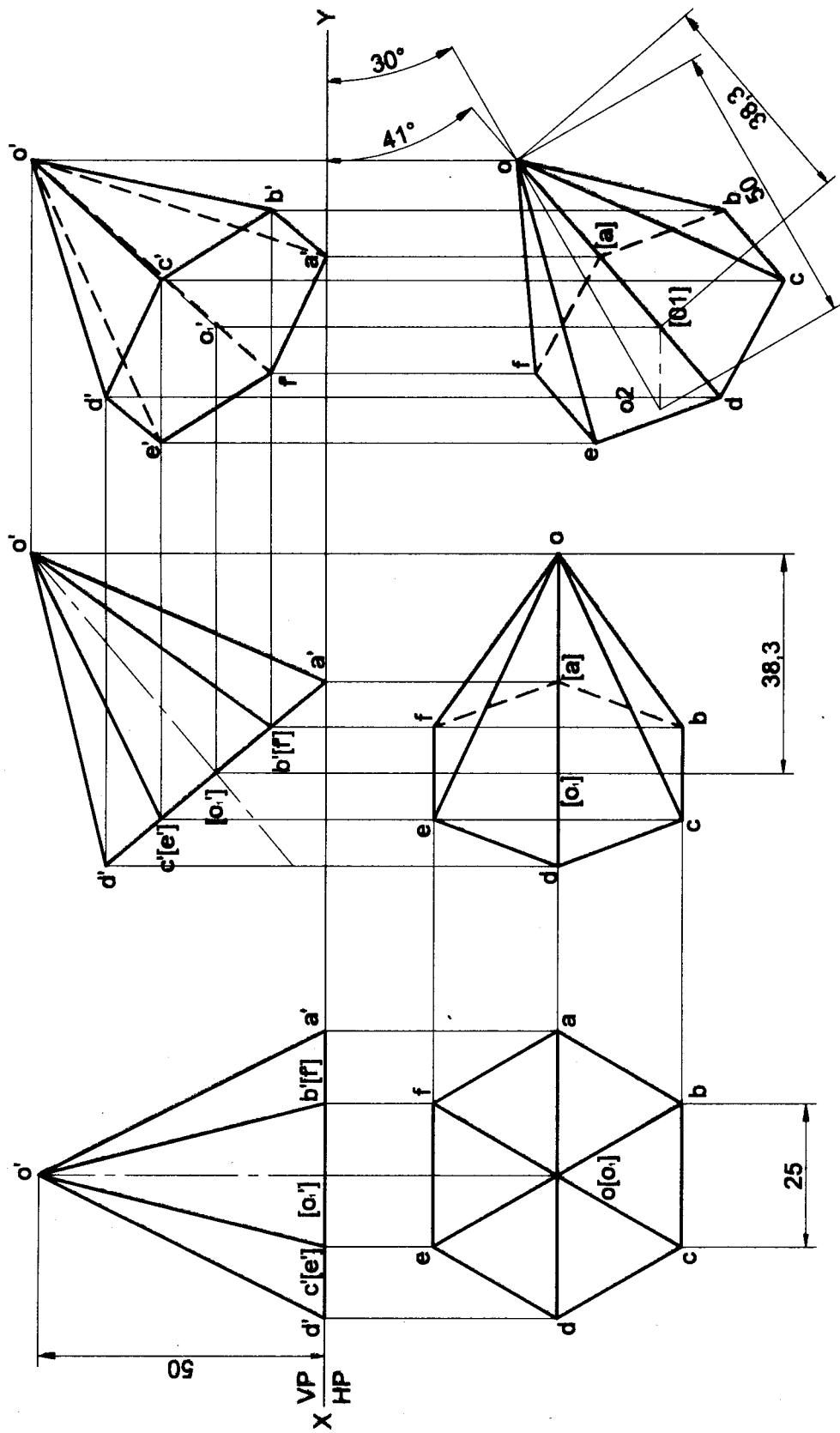
Problem 26 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and appears to be inclined to VP at 45° .

Solution



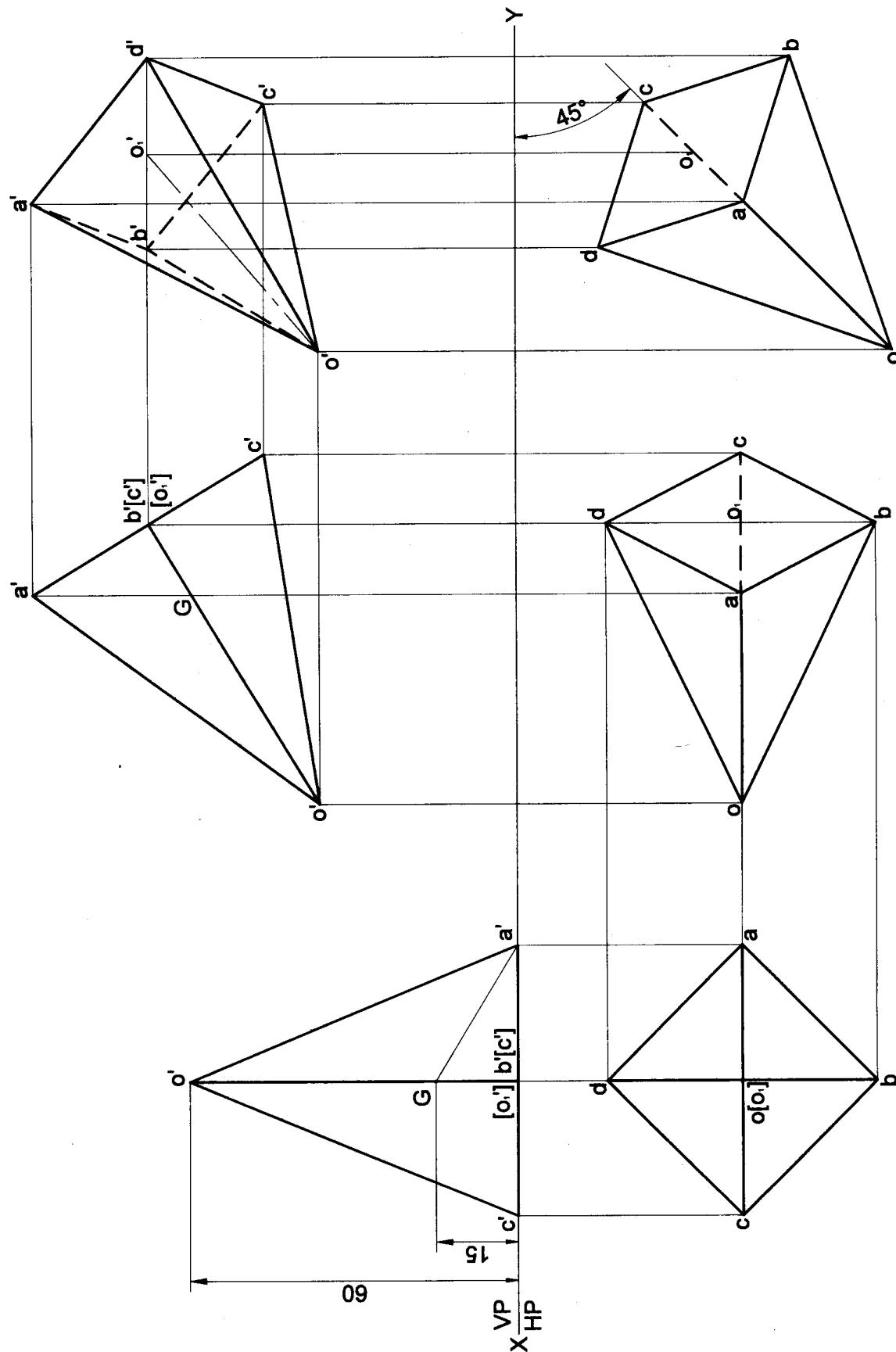
Problem 27 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40° and to VP at 30° .

Solution



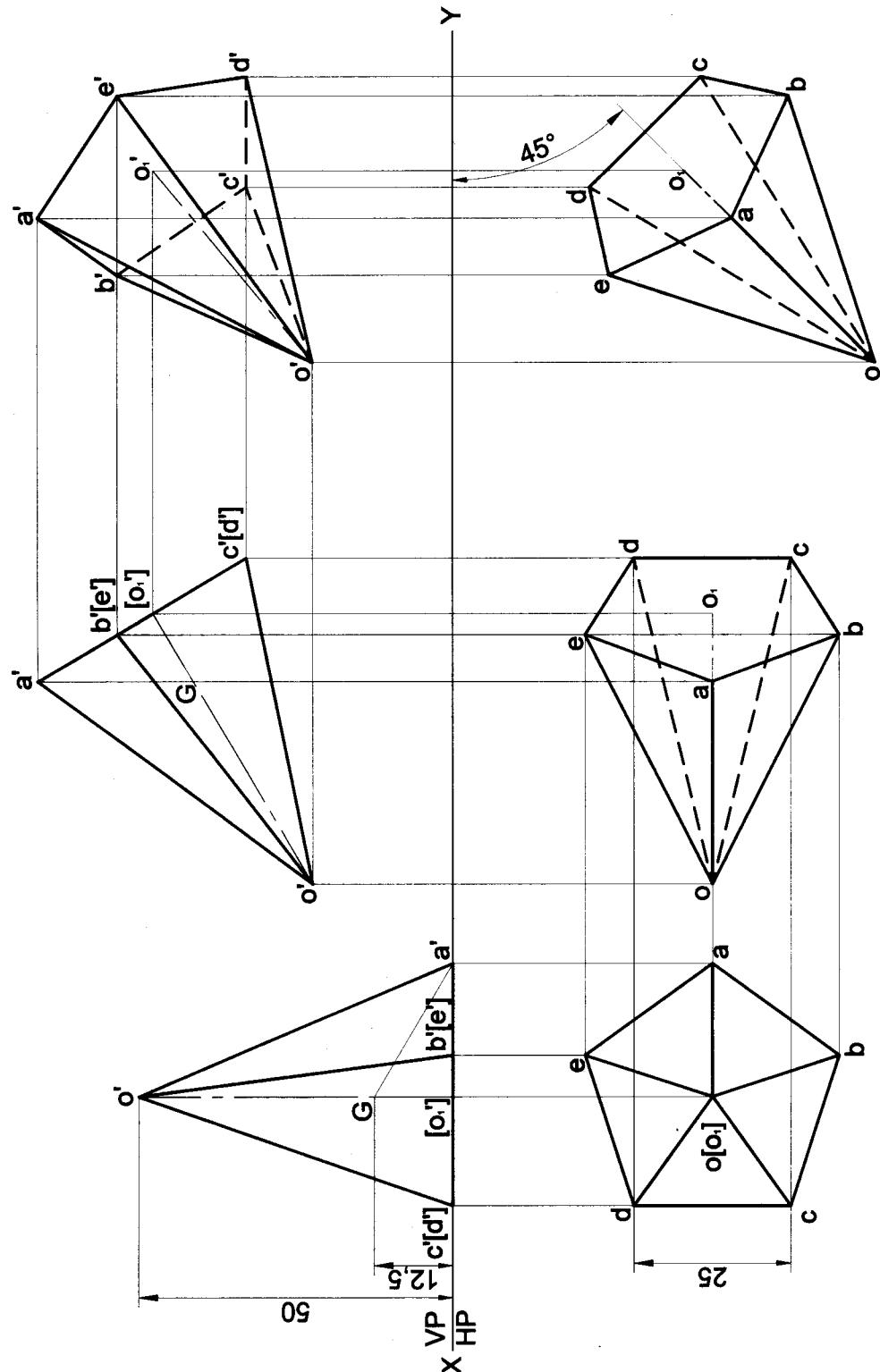
Problem 28 A square pyramid 35 mm sides of base and 60 mm axis length is suspended freely from a corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Solution



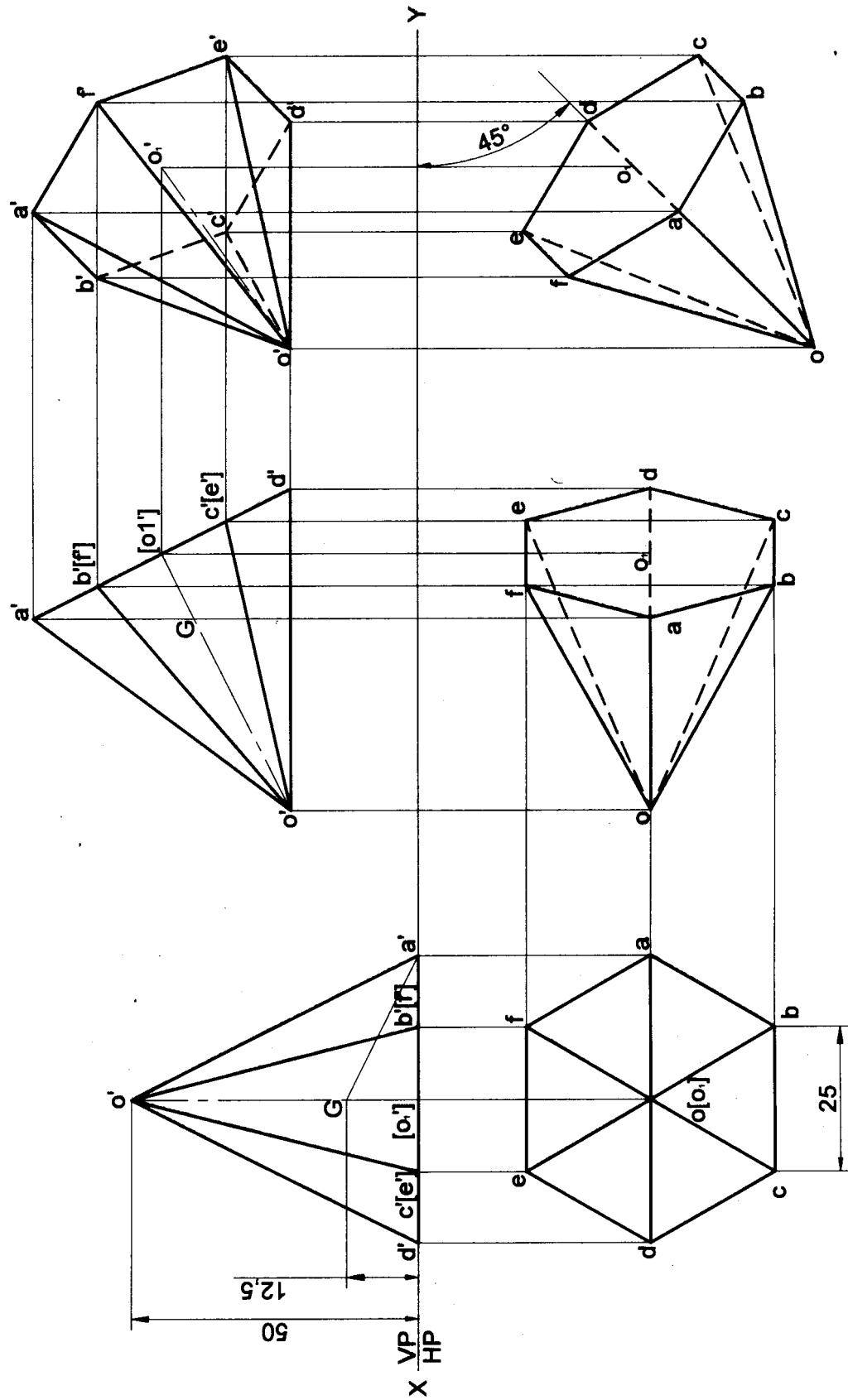
Problem 29 A pentagonal pyramid 25 mm sides of base and 50 mm axis length is suspended freely from a corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Solution



Problem 30 A hexagonal pyramid 25 mm sides of base and 50 mm axis length is suspended freely from a corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

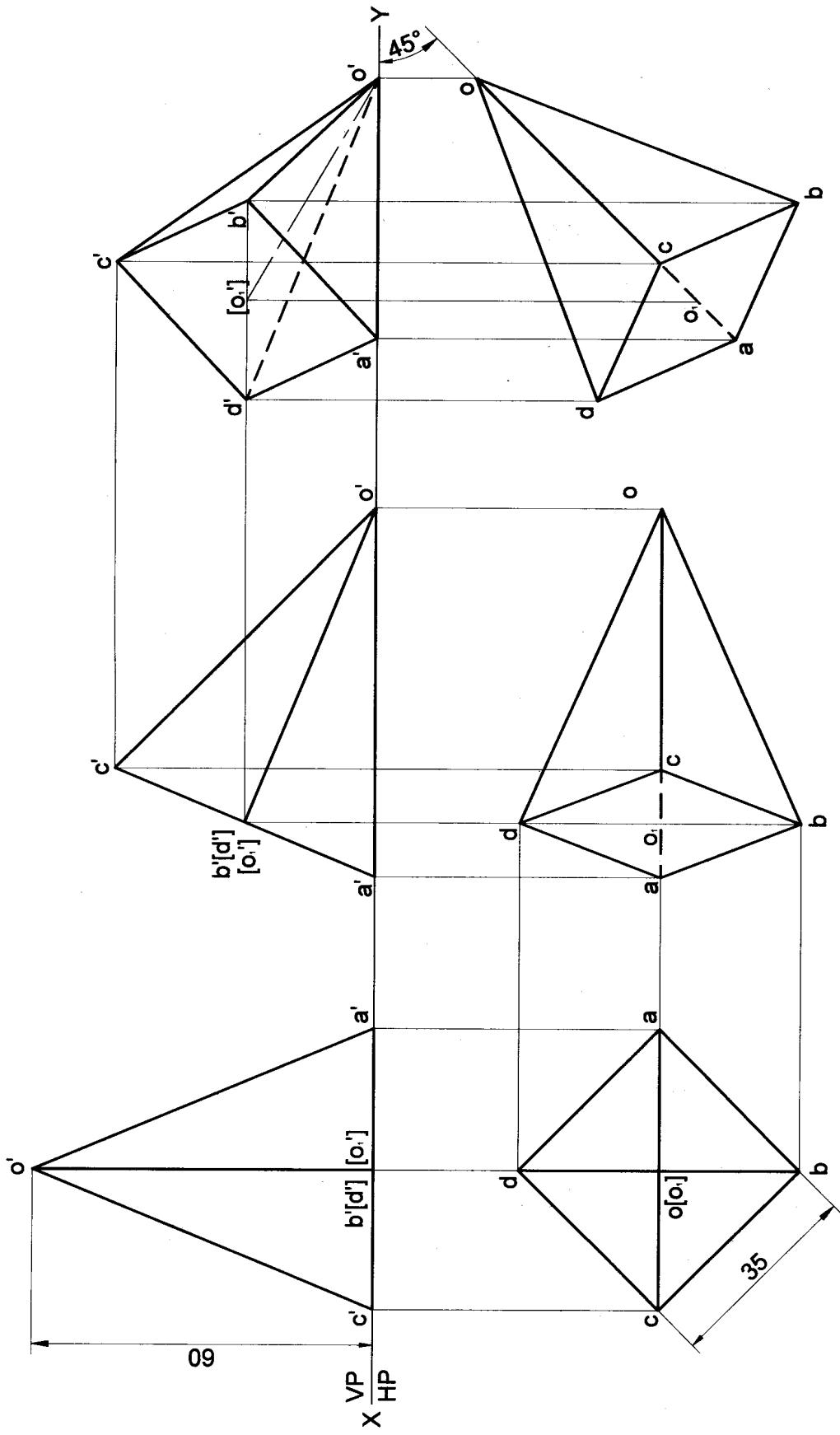
Solution



Problem 31 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

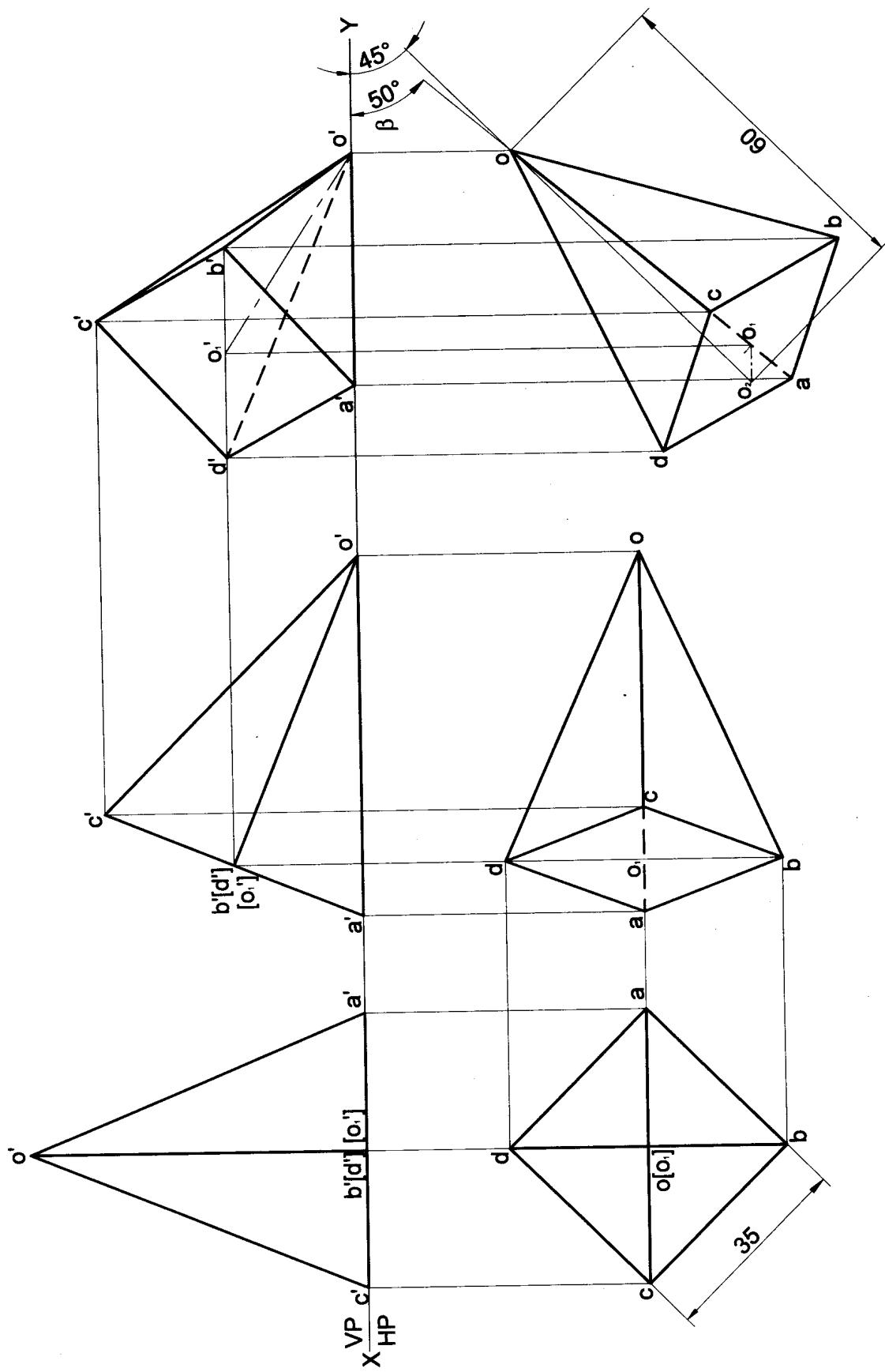
Solution

γ



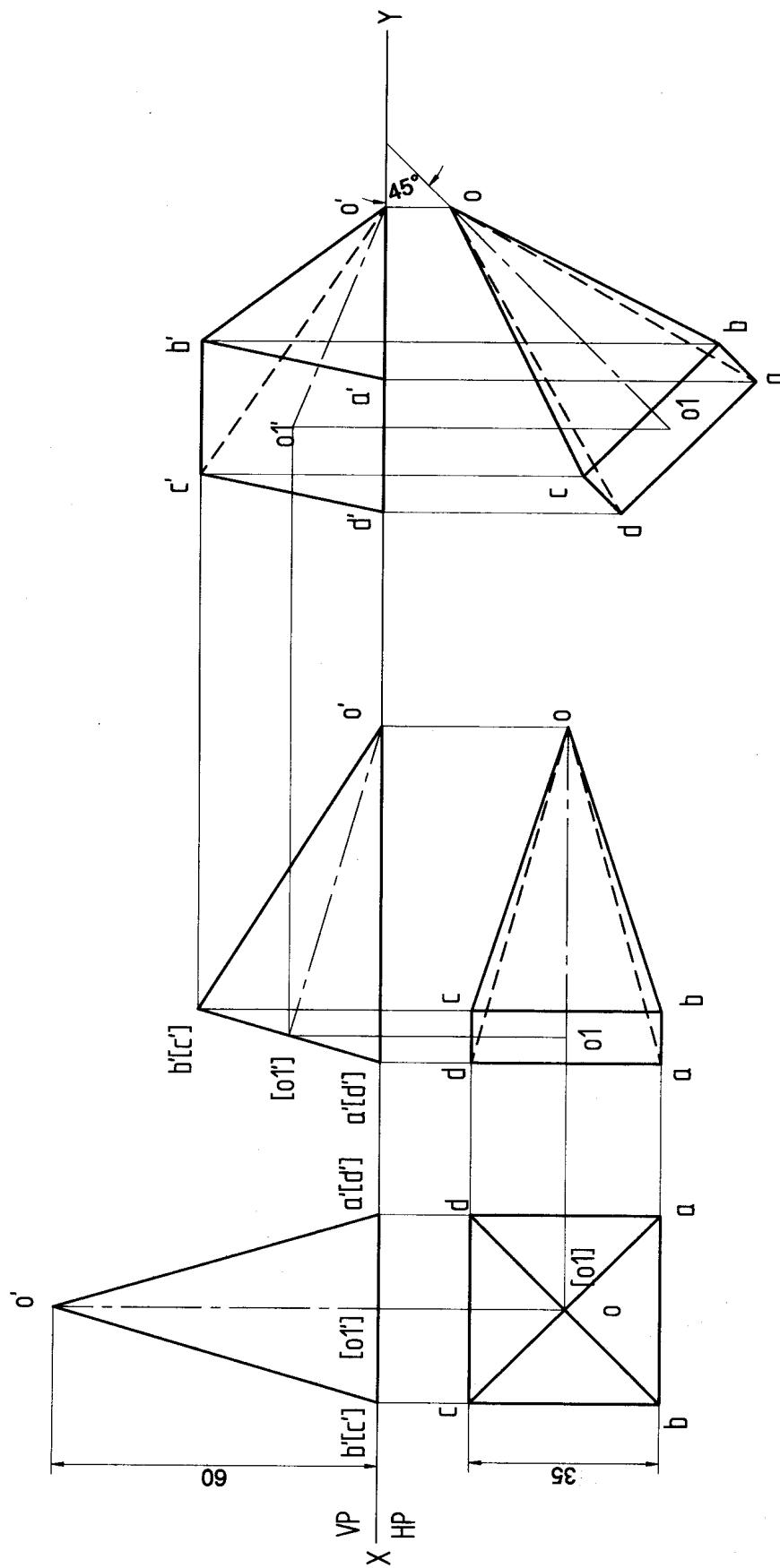
Problem 32 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis is inclined to VP at 45° .

Solution



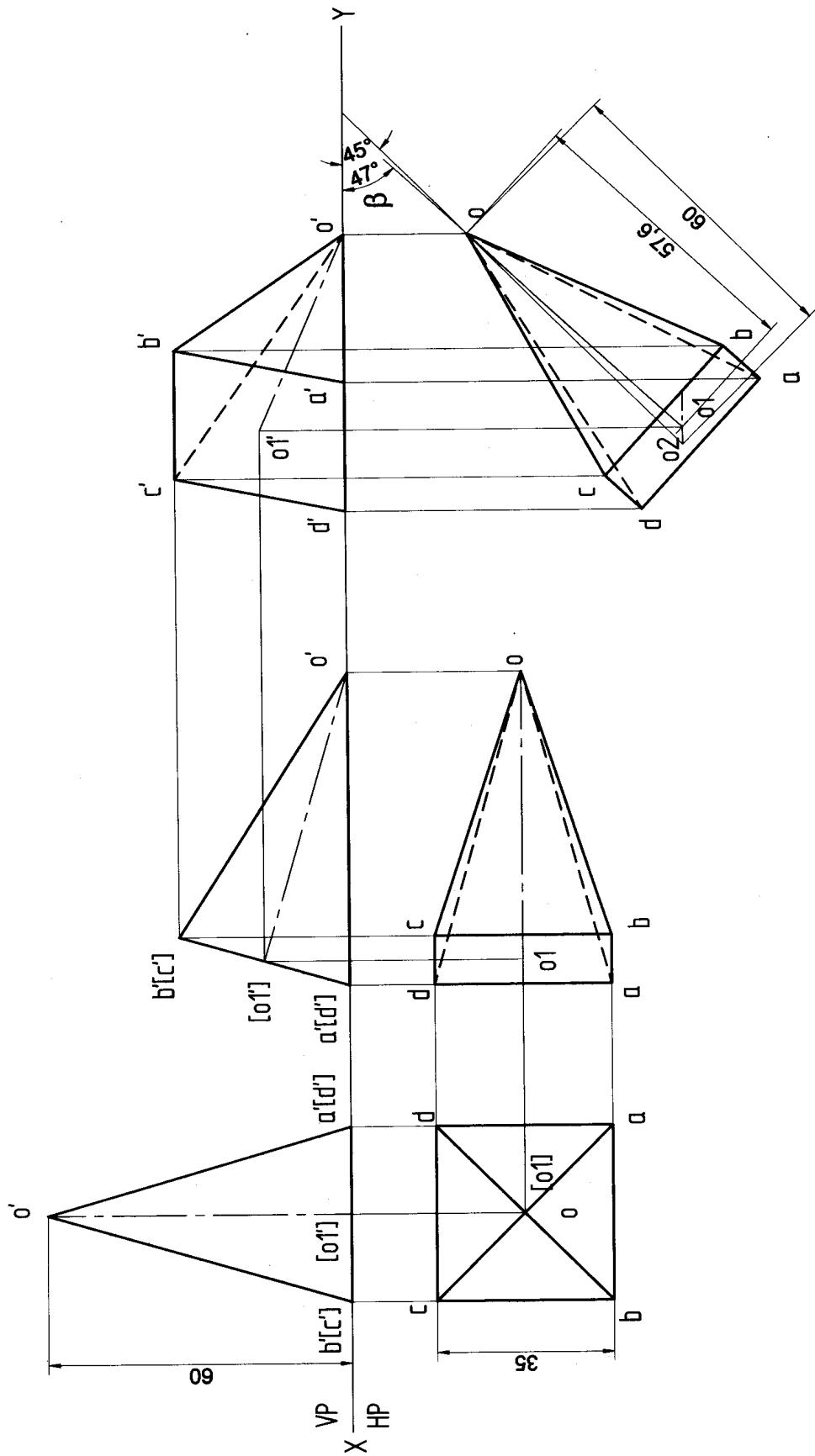
Problem 33 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Solution



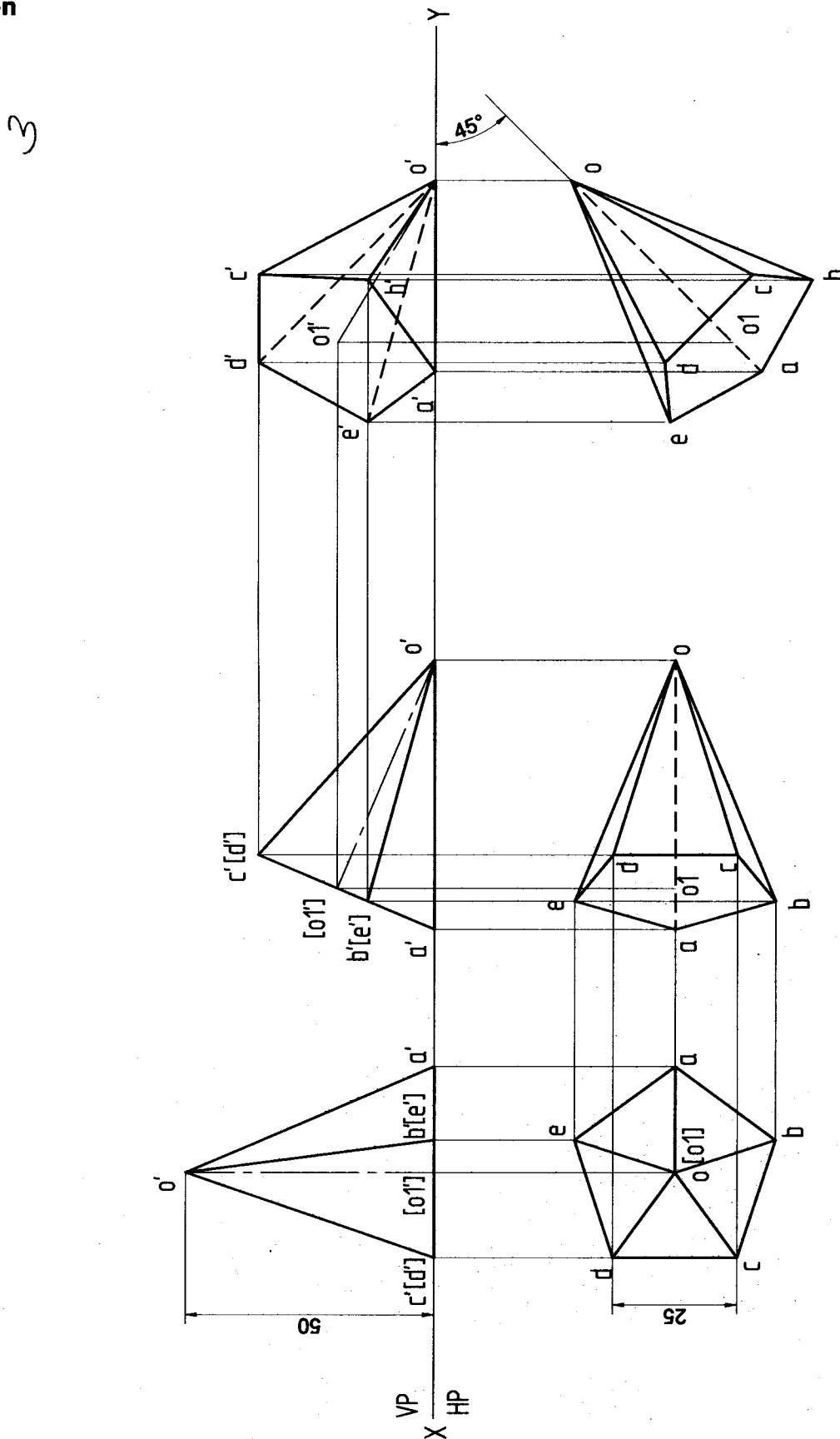
Problem 34 A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45° .

Solution



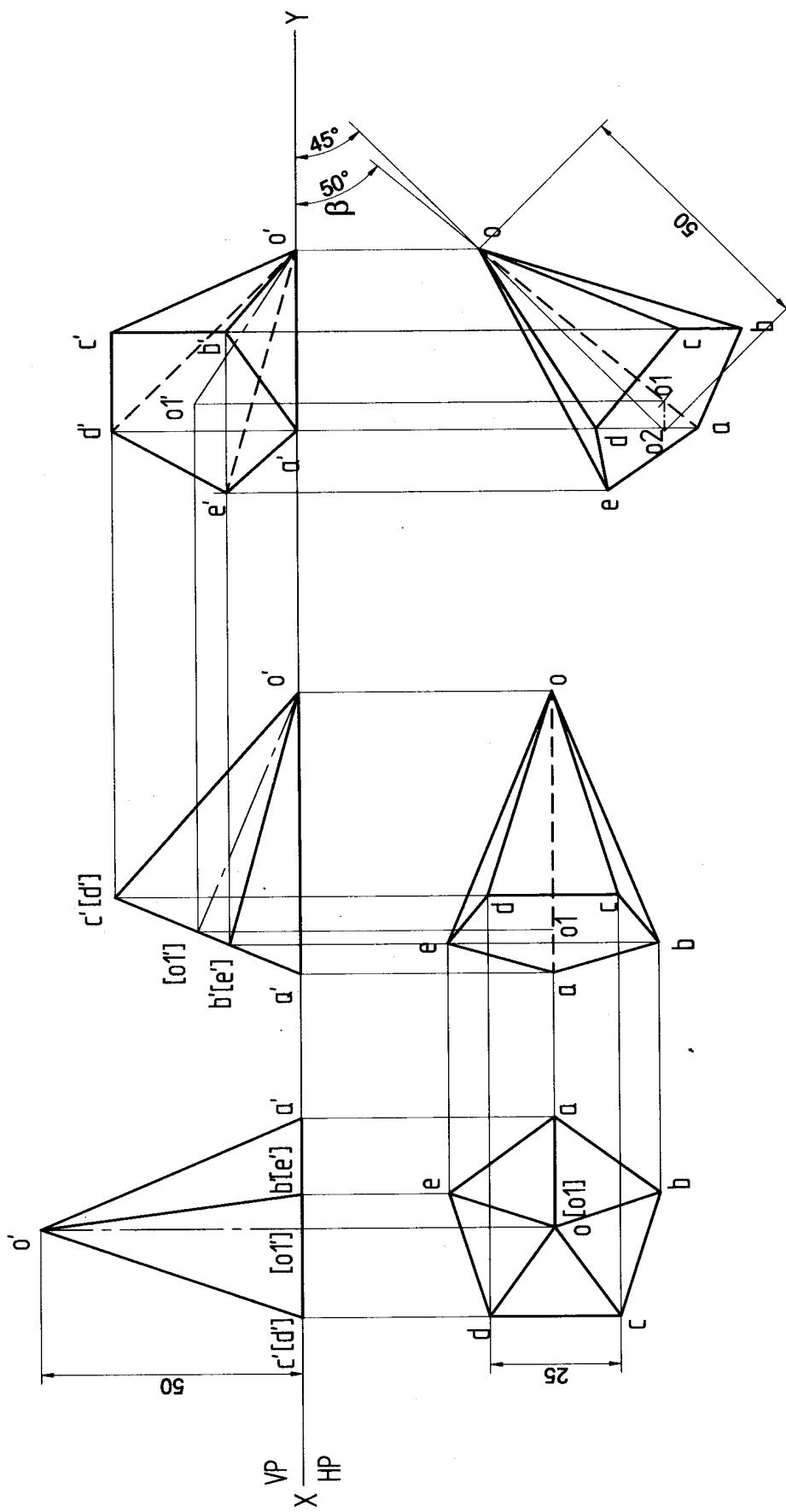
Problem 35 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Solution



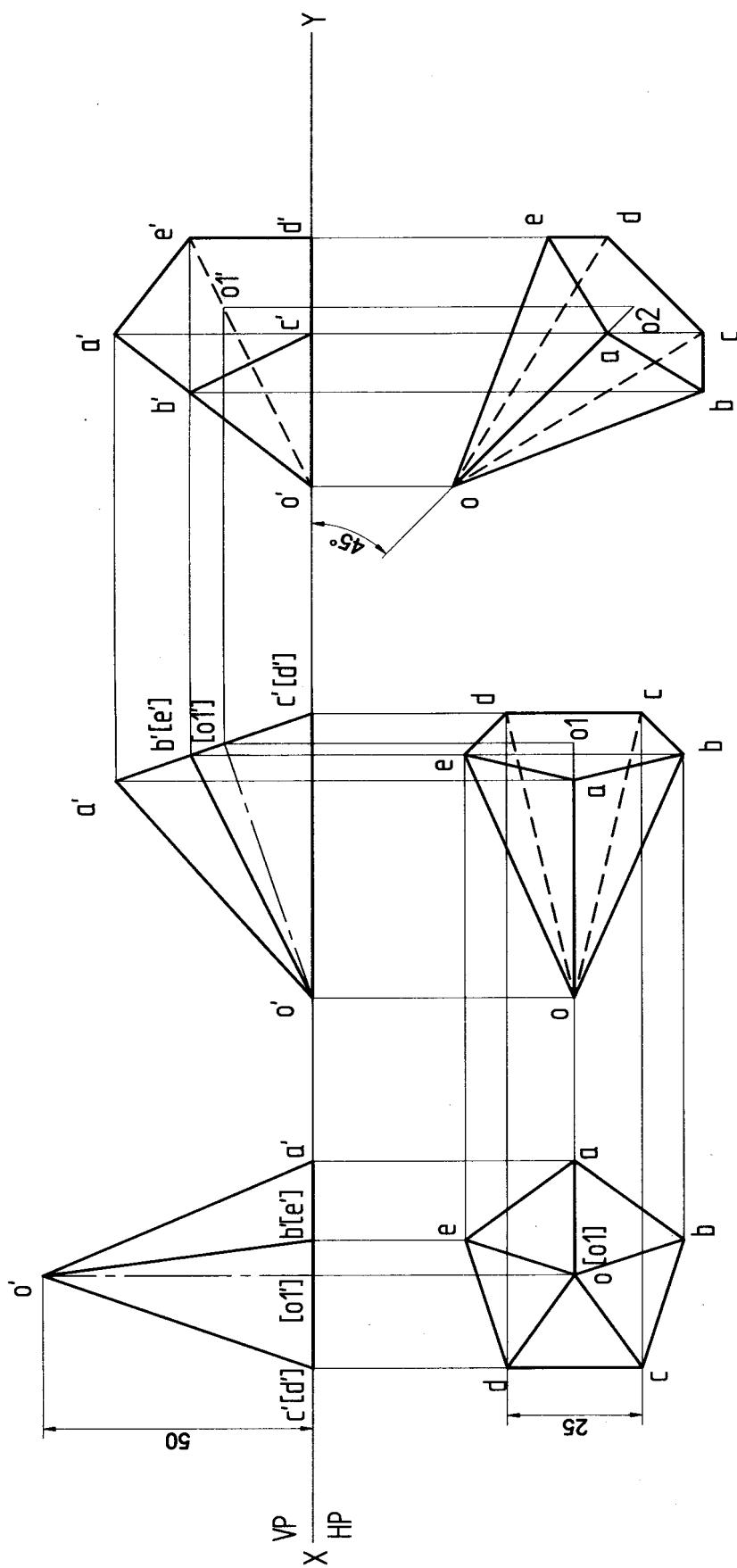
Problem 36 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis is inclined to VP at 45° .

Solution



Problem 37 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

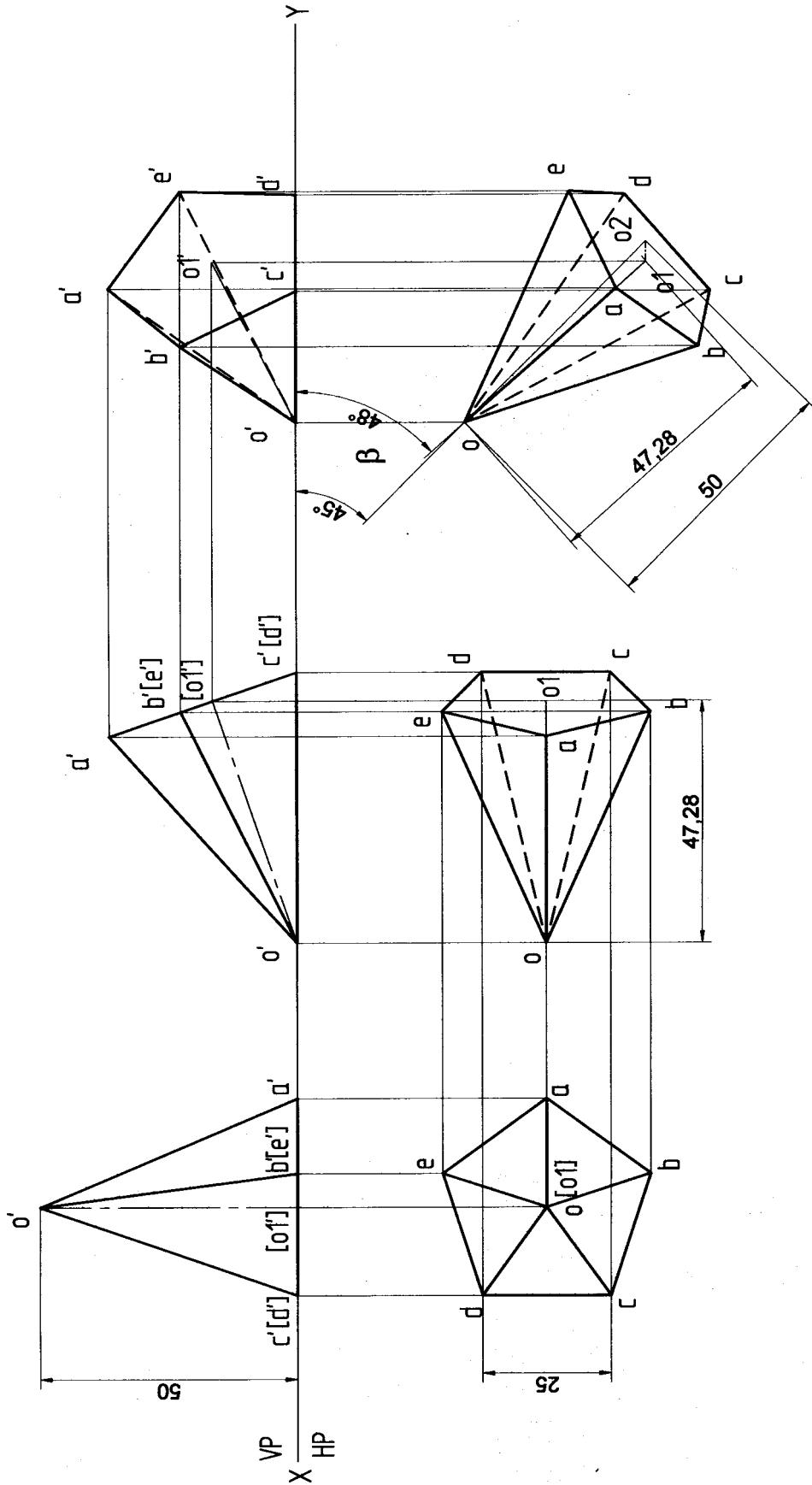
Solution



Problem 38 A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45° .

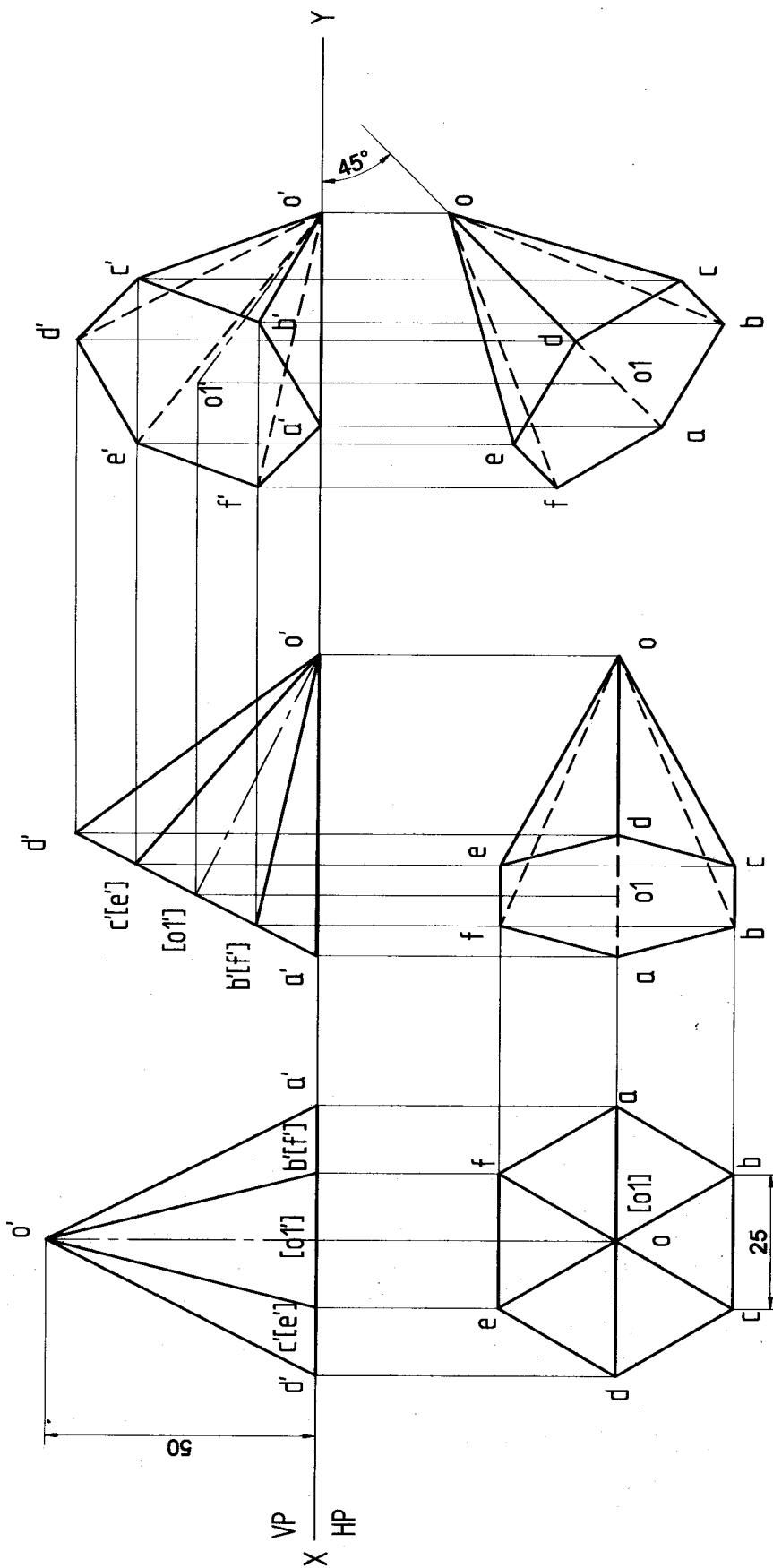
Solution

M



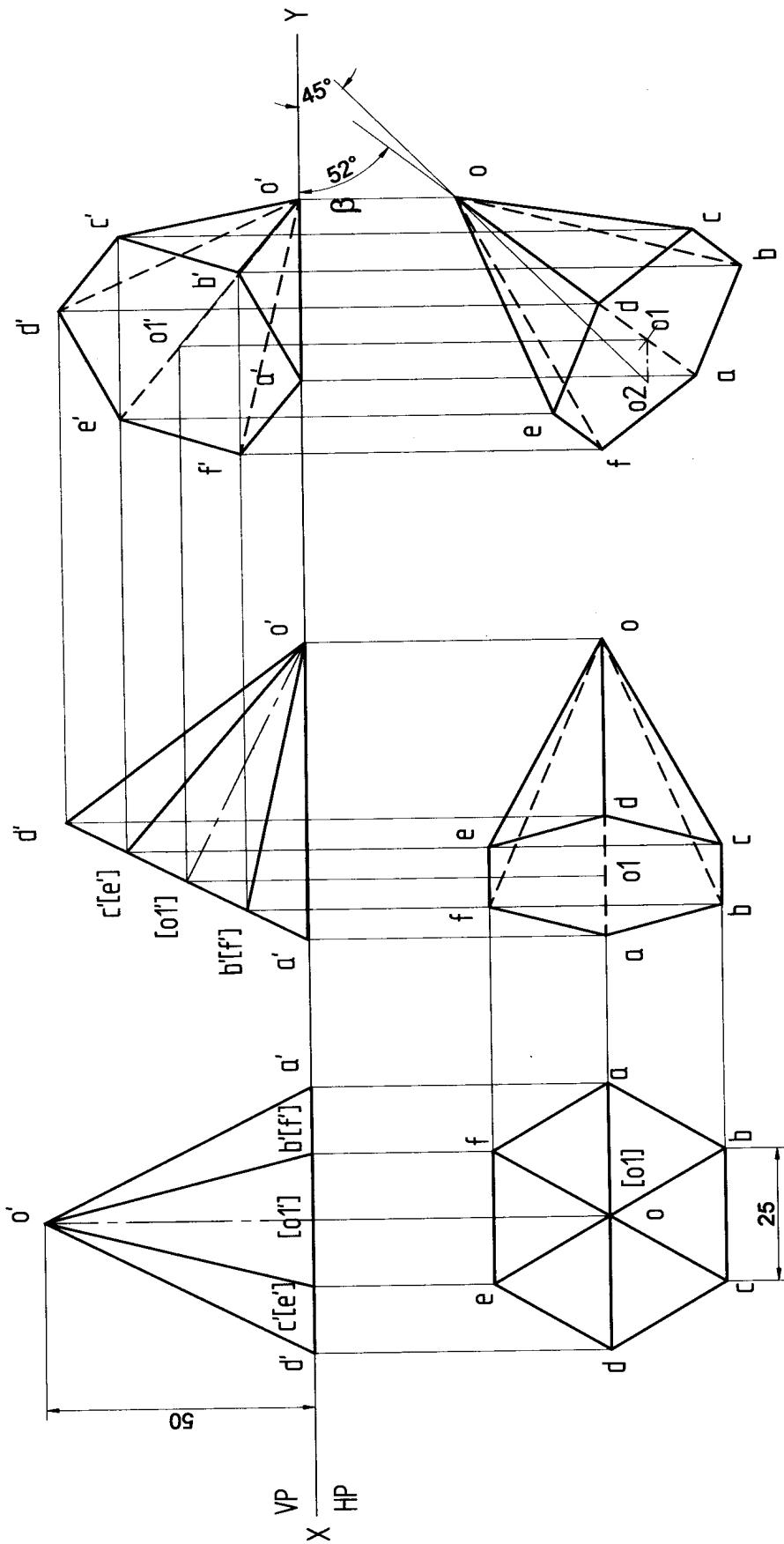
Problem 39 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Solution



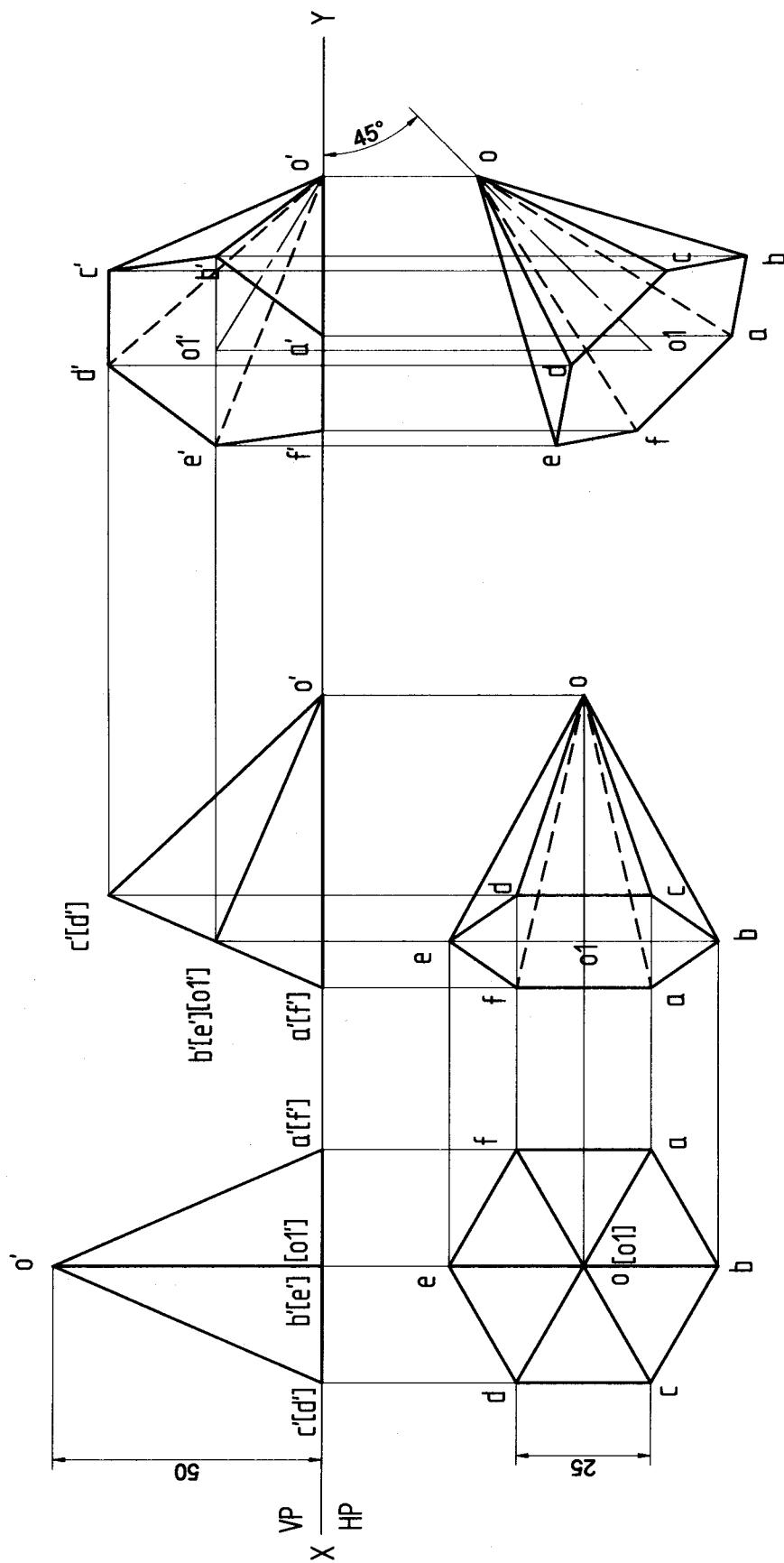
Problem 40 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis is inclined to VP at 45° .

Solution



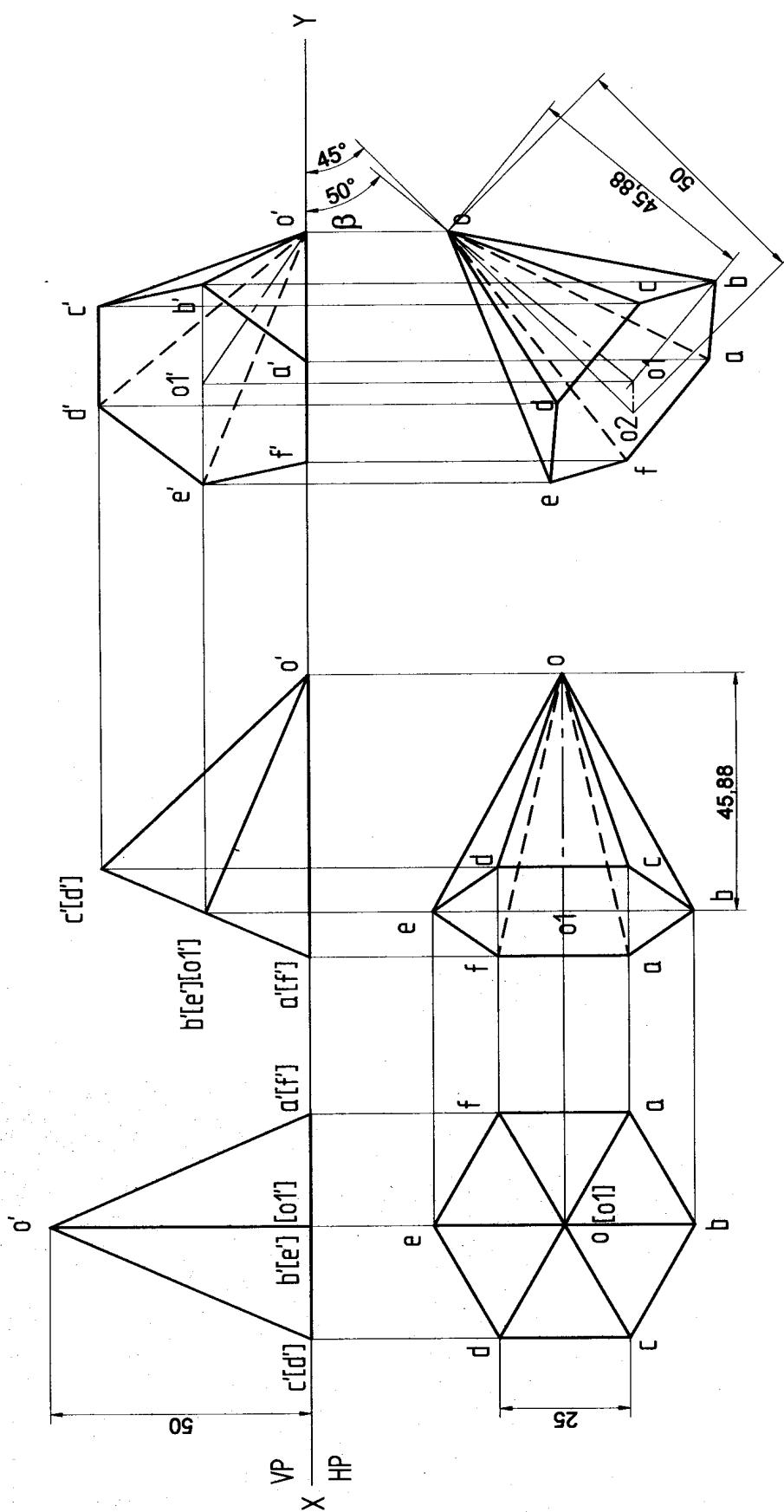
Problem 41 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45° .

Solution



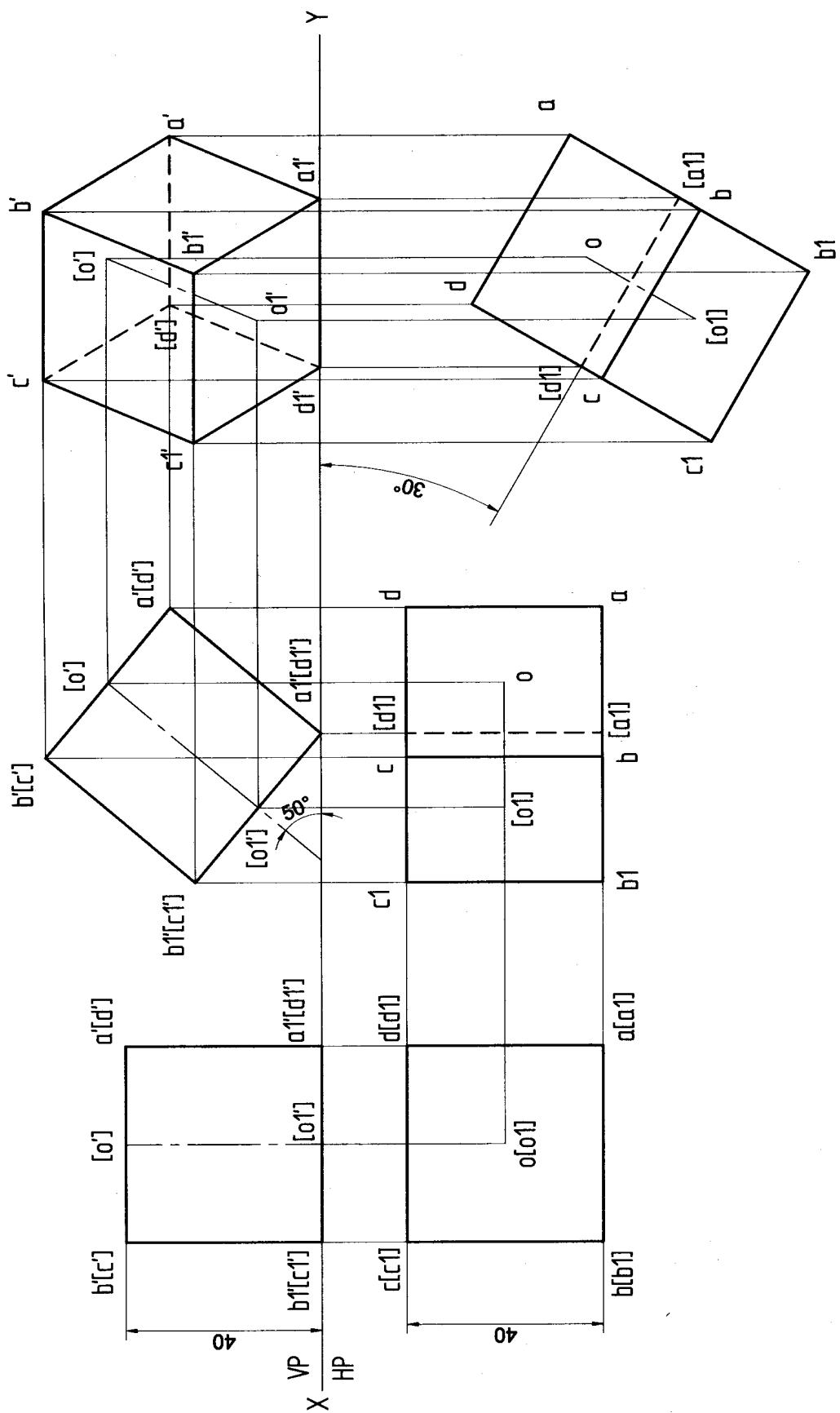
Problem 42 A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45° .

Solution



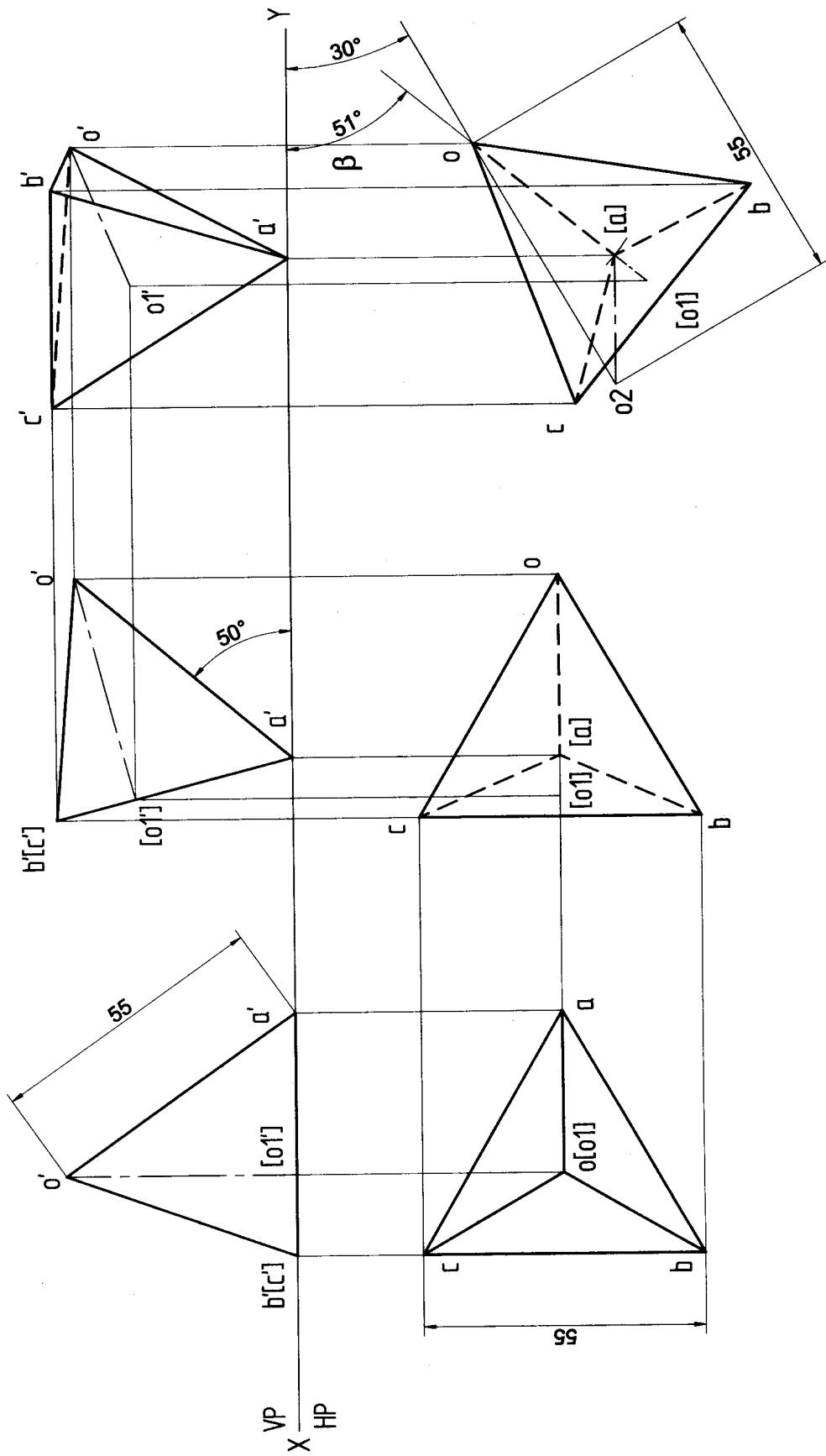
Problem 43 A cube of 40 mm sides rests on HP on an edge which is inclined to VP at 30° . Draw the projections when the lateral square face containing the edge on which it rests makes an angle of 50° to HP.

Solution



Problem 44 A tetrahedron of 55 mm sides rests on one of its corners such that an edge containing that corner is inclined to HP at 50° and VP at 30° . Draw its projections.

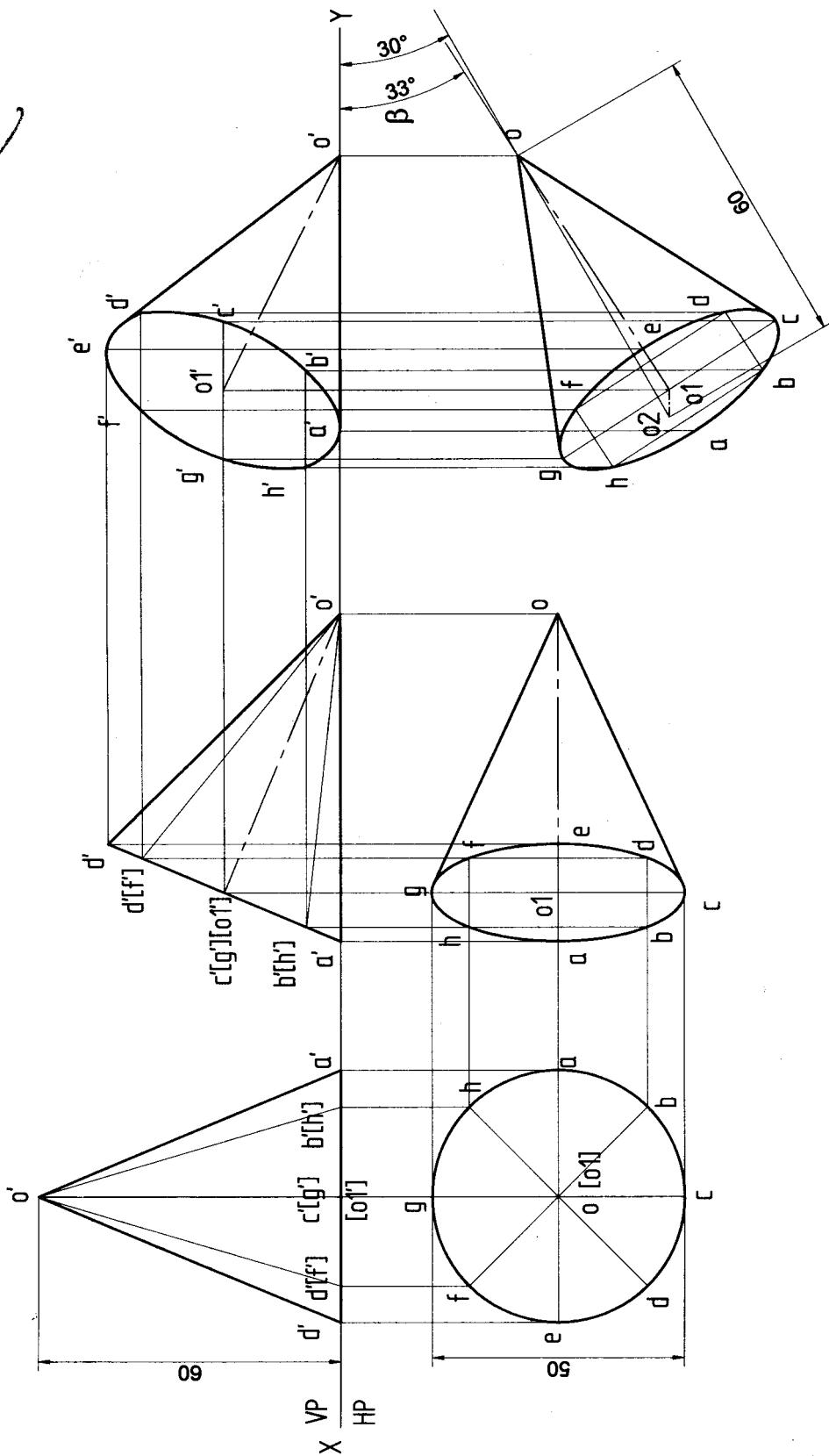
Solution



Problem 45 A cone of 50 mm base diameter and 60 mm axis length rests on HP on one of its generators. Draw its projections when the axis is inclined to VP at 30° .

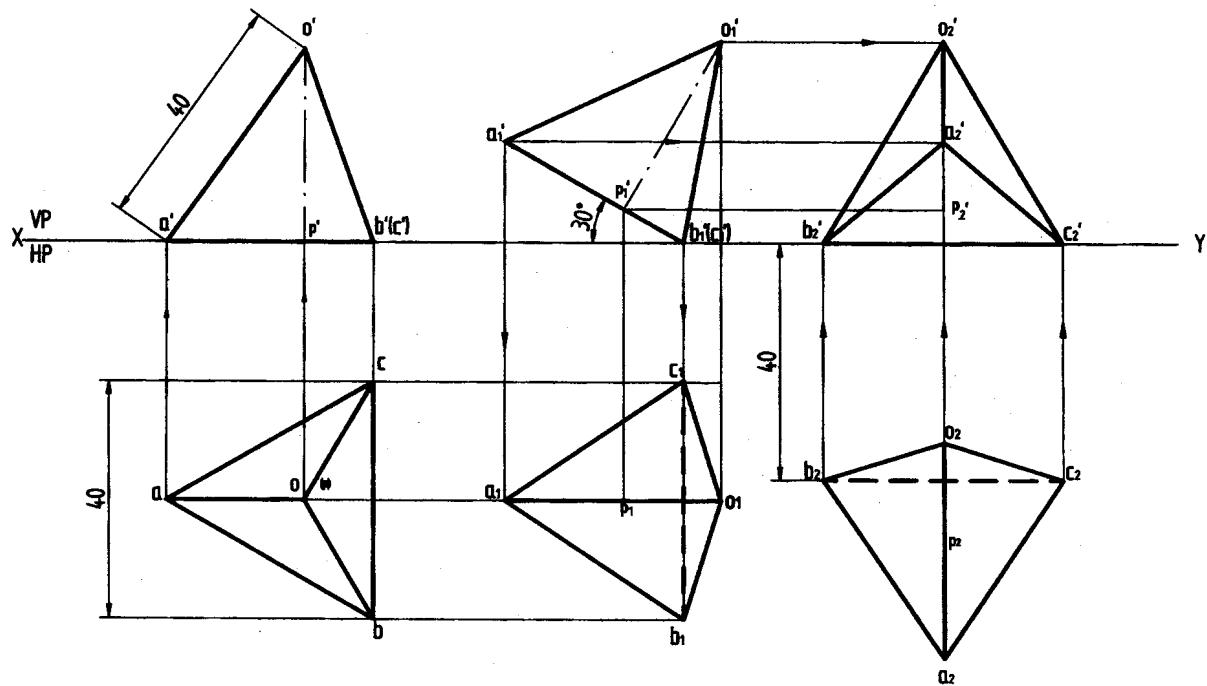
Solution

June 09



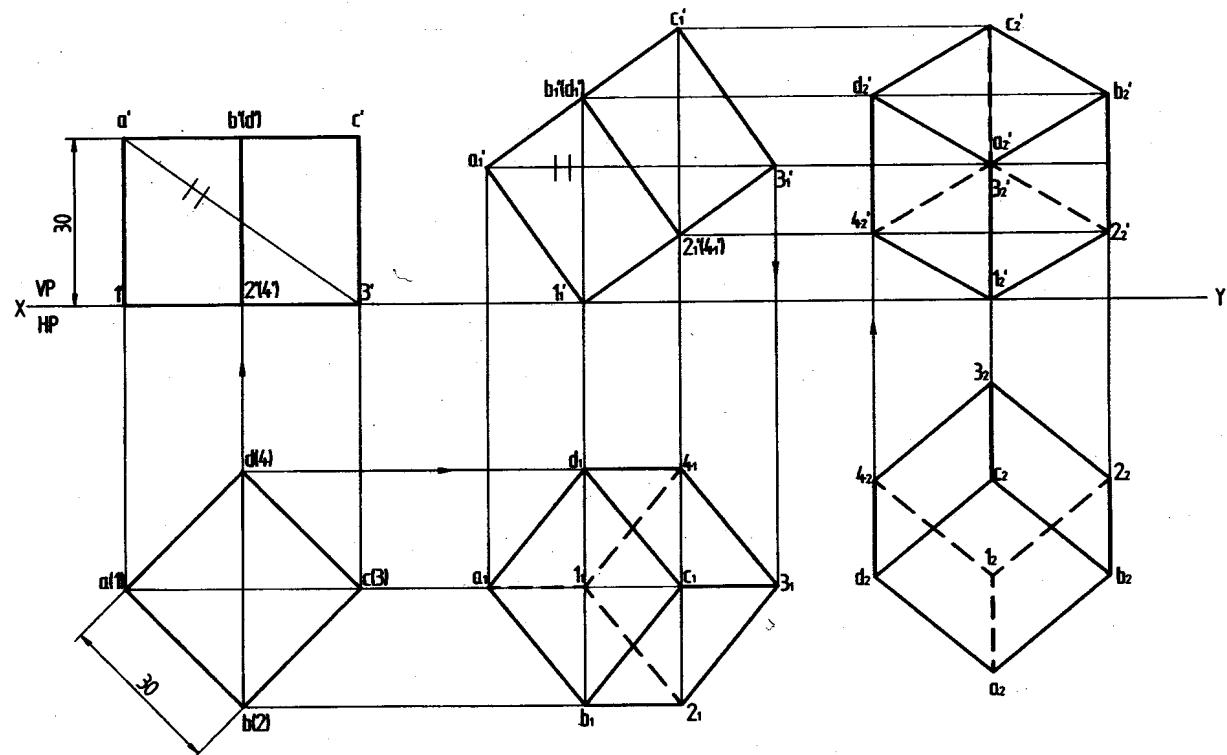
Problem 46 A tetrahedron of sides 40 mm is resting on one of its sides on HP. This side is parallel to VP and 40 mm away from it. It is tilted about resting side such that the base containing this edge is inclined at 30° to HP. Draw the projections of the solid.

Solution



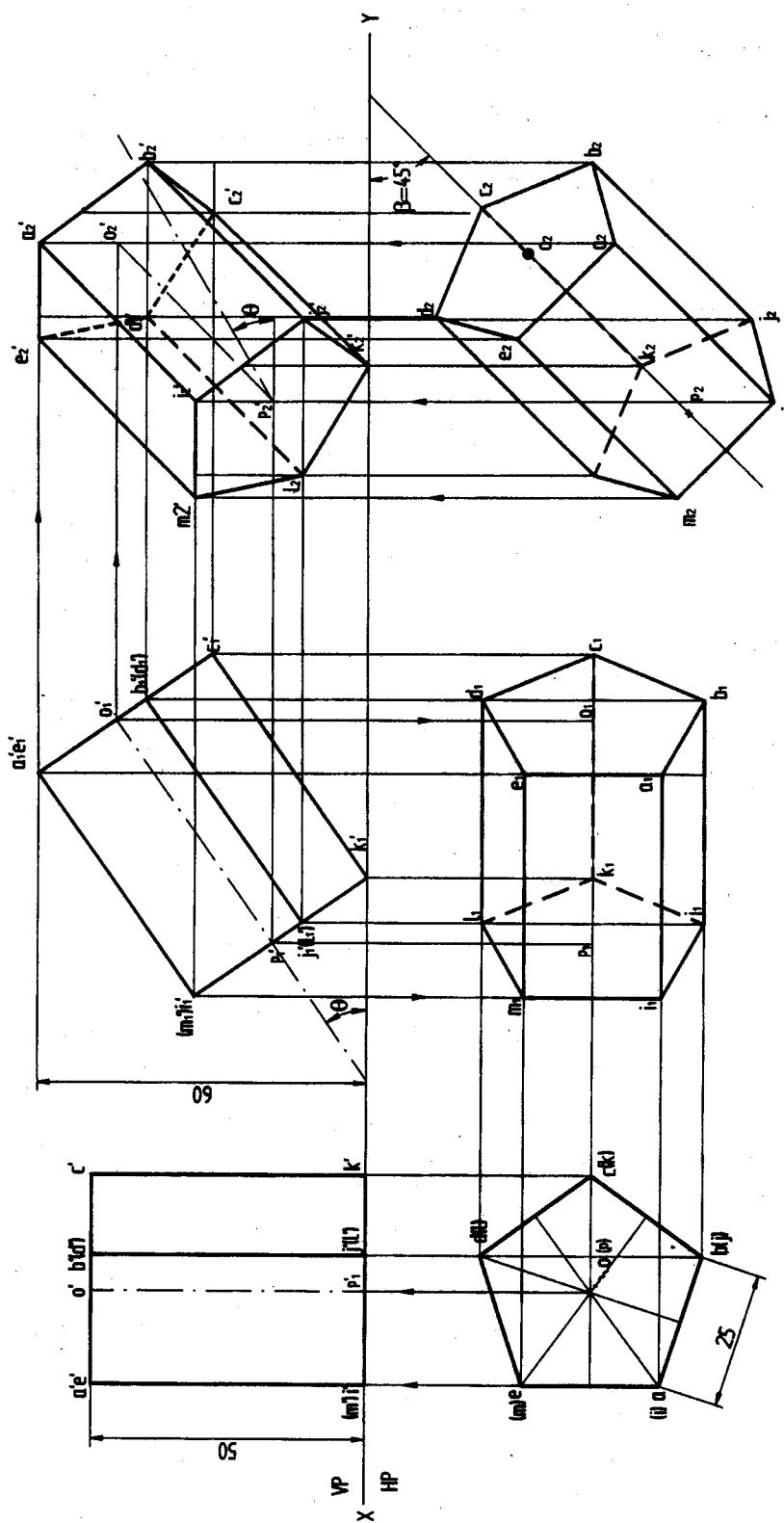
Problem 47 A Hexahedron of 30 mm sides is resting on one of its corners on HP such that one of its solid diagonals is perpendicular to VP. Draw the projections of the solid.

Solution



Problem 48 A pentagonal prism of base side 25 mm and height 50 mm is resting on HP on one of its base corners such that the top most edge is at a distance of 60 mm above VP. Draw its projections, when its top view of the axis is inclined at 45° to VP. Also, determine the inclination of the longer edge of the prism to HP which contains the resting corner.

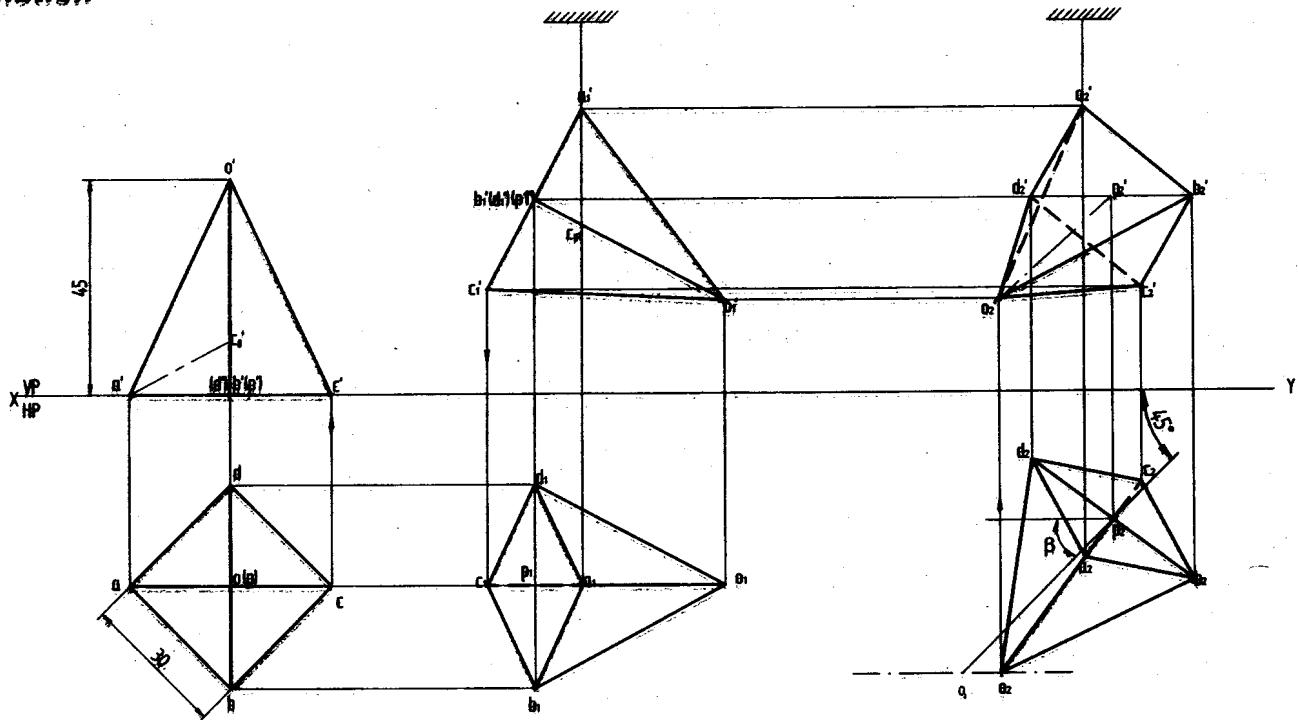
Solution



ANSWER
 $\theta = 35^\circ$

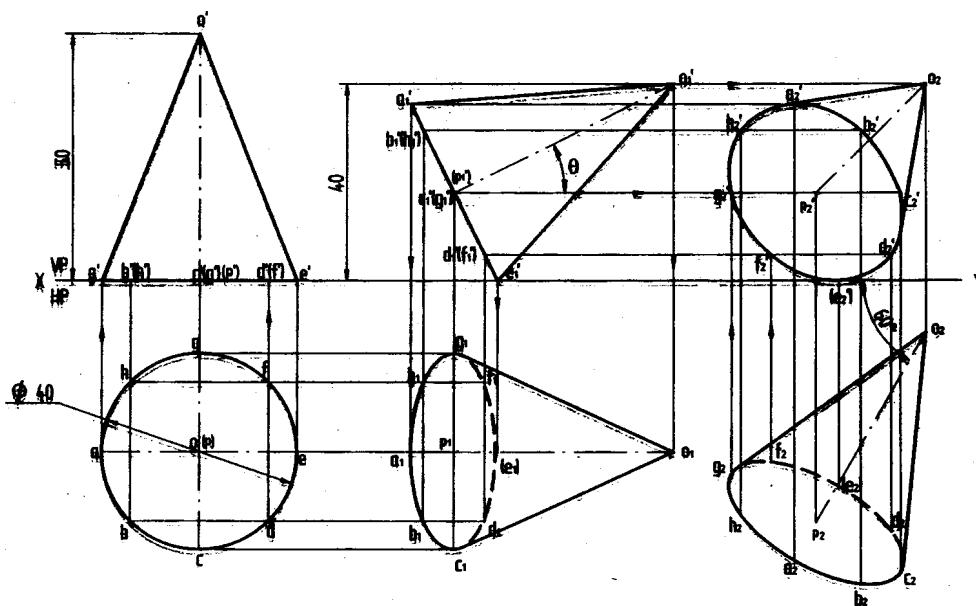
Problem 49 A square pyramid of base sides 30 mm and height 60 mm is suspended by a thread tied to one of the corners of its base. It is then tilted such that the axis makes an angle of 45° with respect to the VP. Considering the apex of the solid to be nearer to the observer, draw the projections of the solid.

Solutien



Problem 50 A cone of base dia. 40 mm and axis length 50 mm is resting on HP on a point on the circumference of its base such that its apex is at 40 mm above the HP and its top view of the axis is inclined at 60° to VP. Draw the top and front views of the solid. Also, determine the inclinations of the axis when the base is nearer to the observer.

Solutien



ANSWERS $\theta = 26^\circ$
 $\phi = 51^\circ$

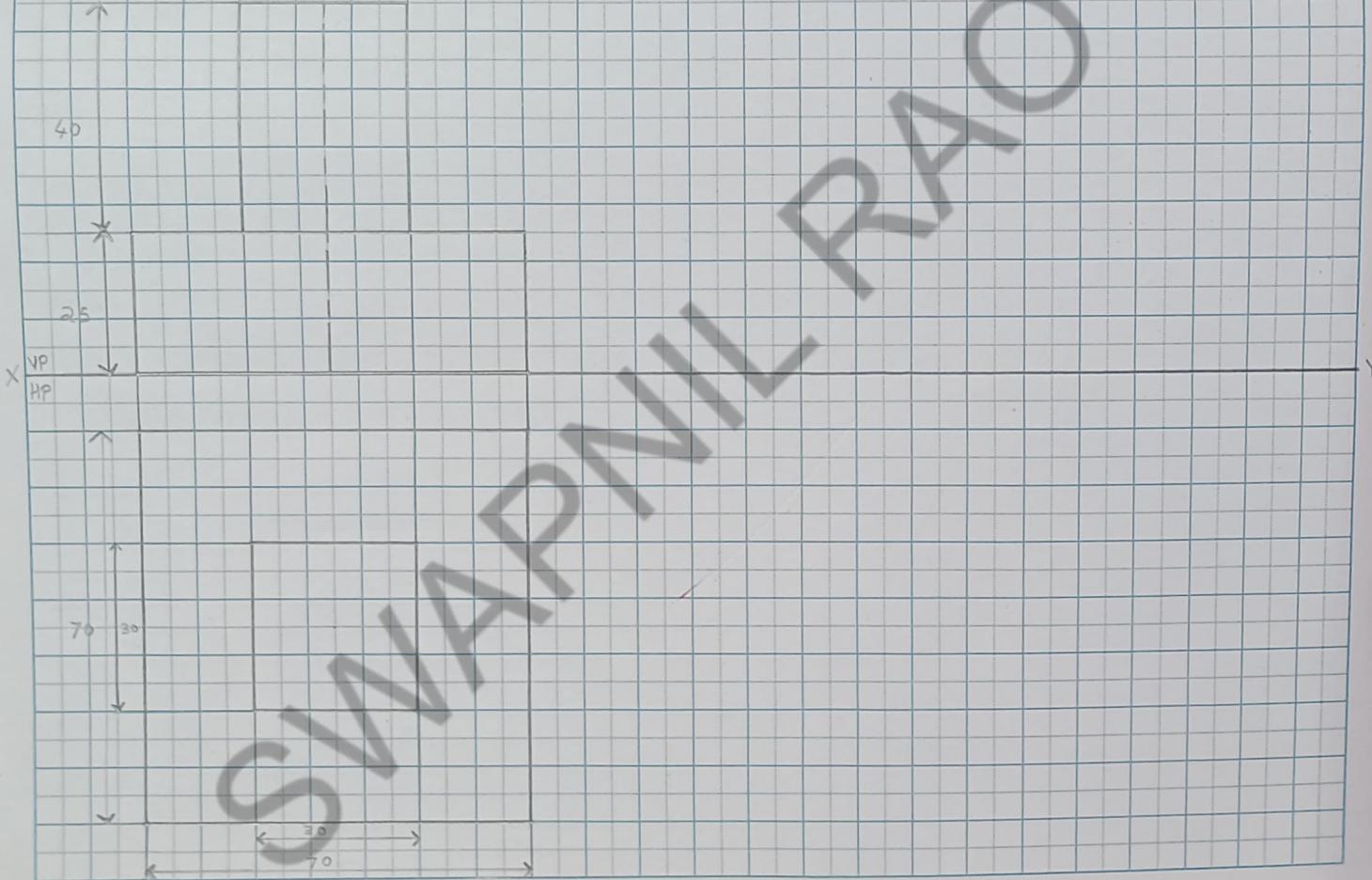
ISOMETRIC:

REFERENCE PLAYLIST:

[https://www.youtube.com/watch?
v=xYHvPvVWWMU&list=PL5FthDAhPUufKsFw0
8eaolq7PLFhXajEh](https://www.youtube.com/watch?v=xYHvPvVWWMU&list=PL5FthDAhPUufKsFw08eaolq7PLFhXajEh)

TITLE : Question -3

SCALE :

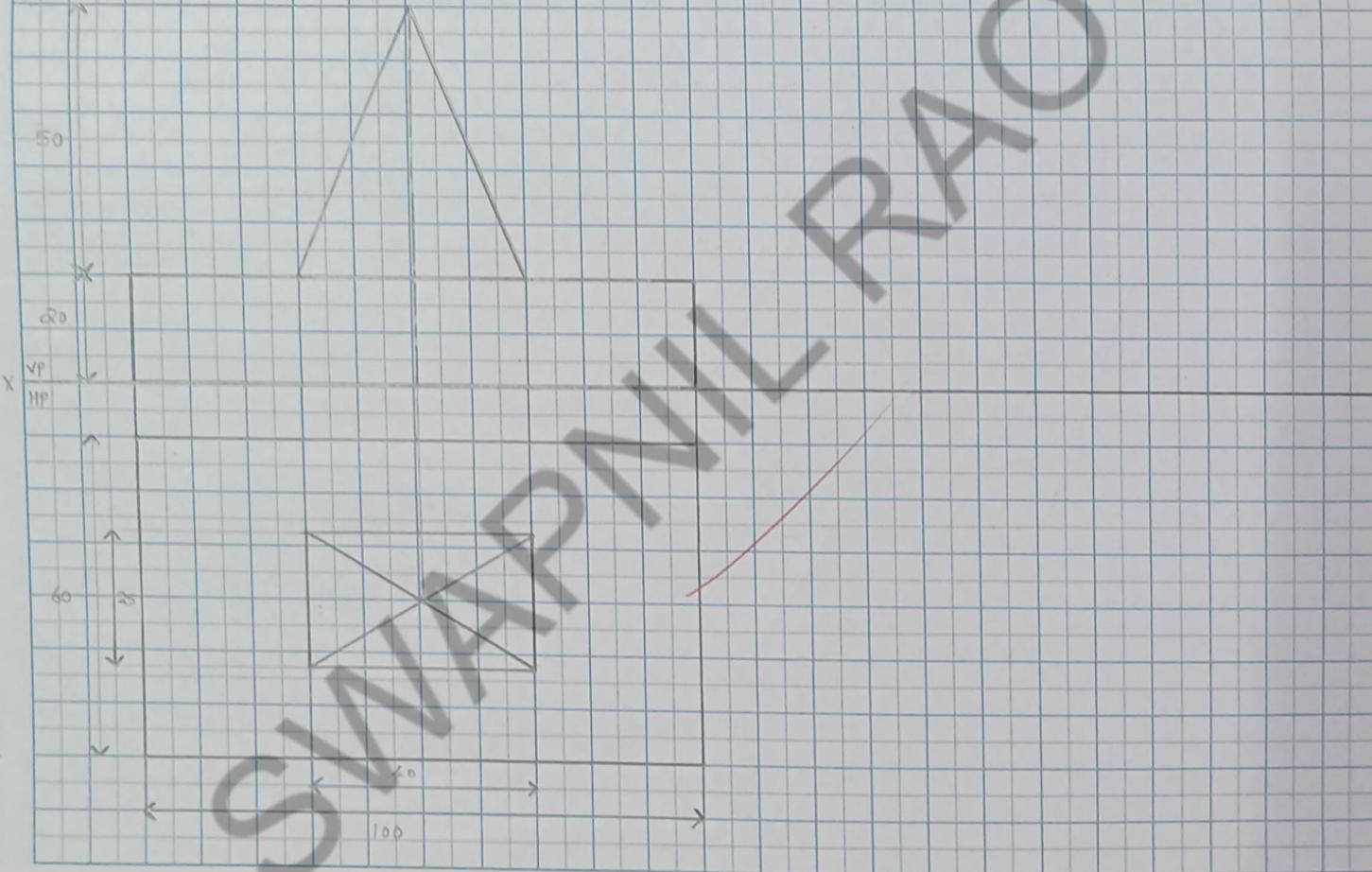


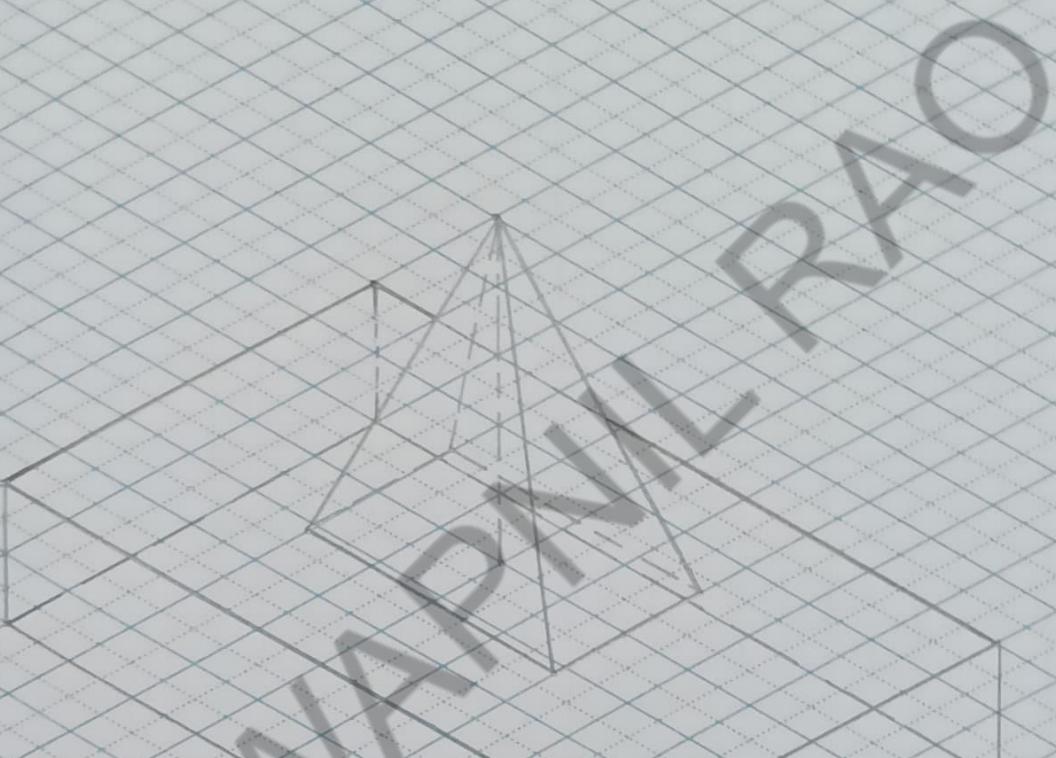
SWADHARA

30° 30°

TITLE : Question - 10

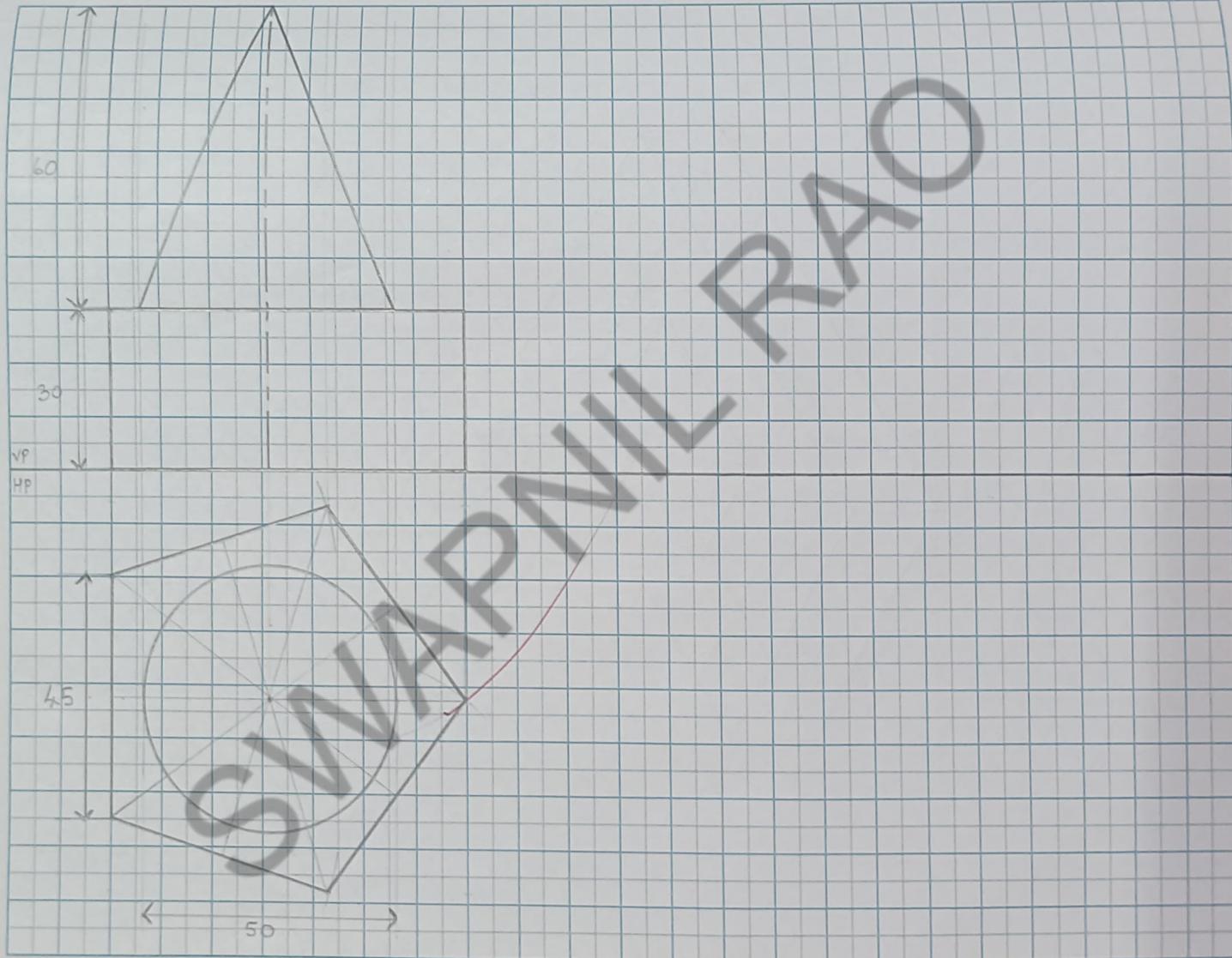
SCALE :



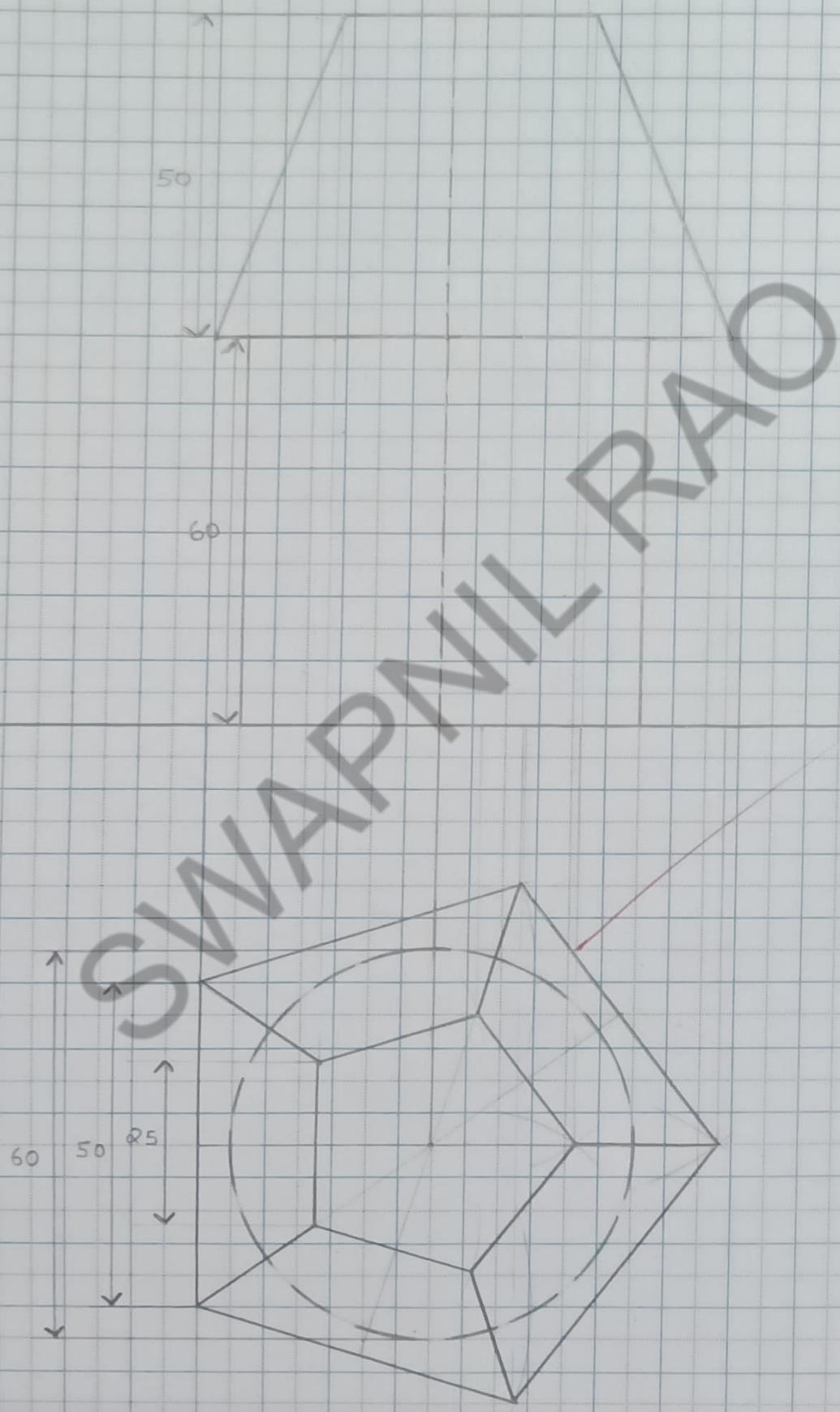


TITLE : Question - 3

SCALE :



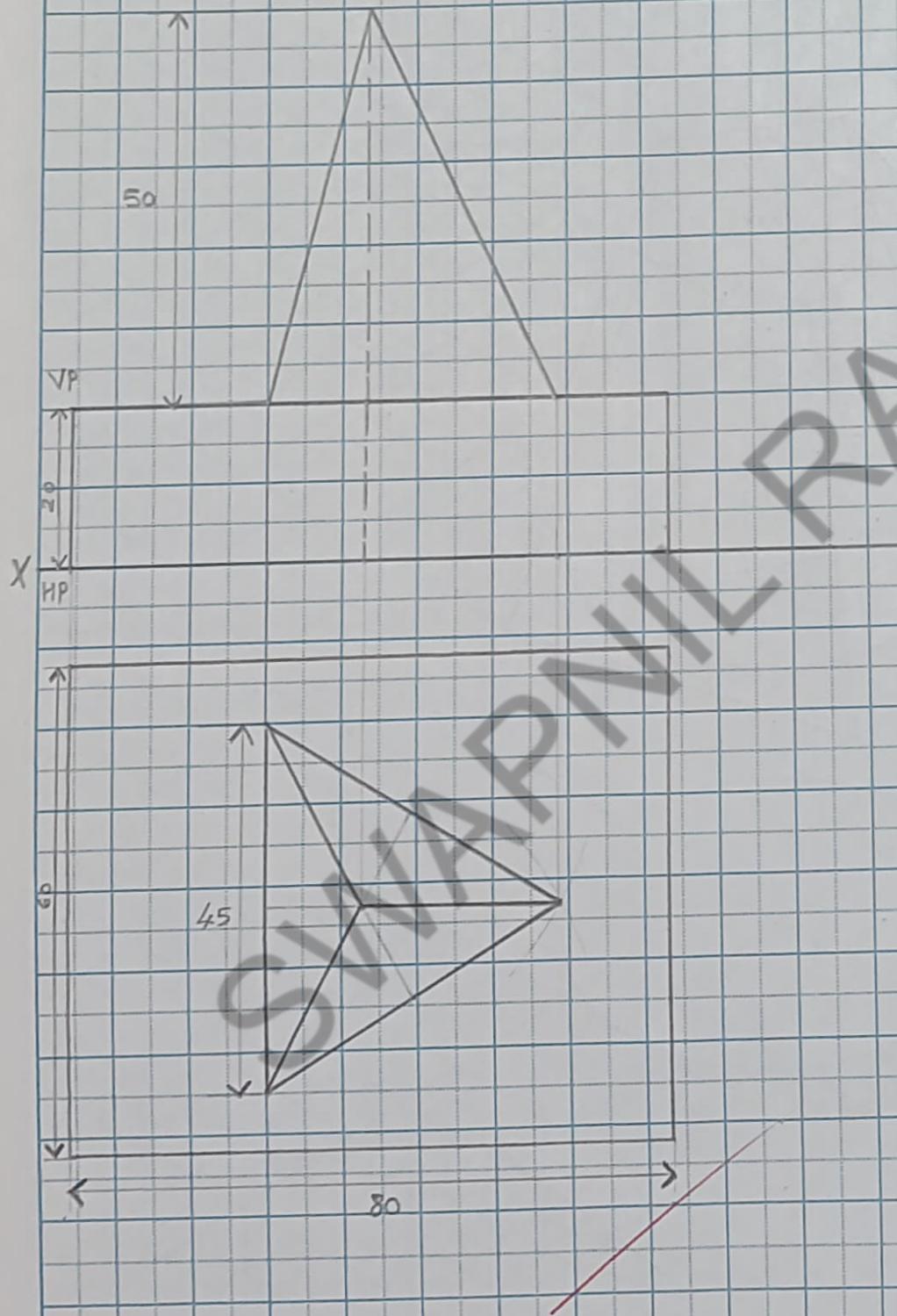
SWAPNIL KHO

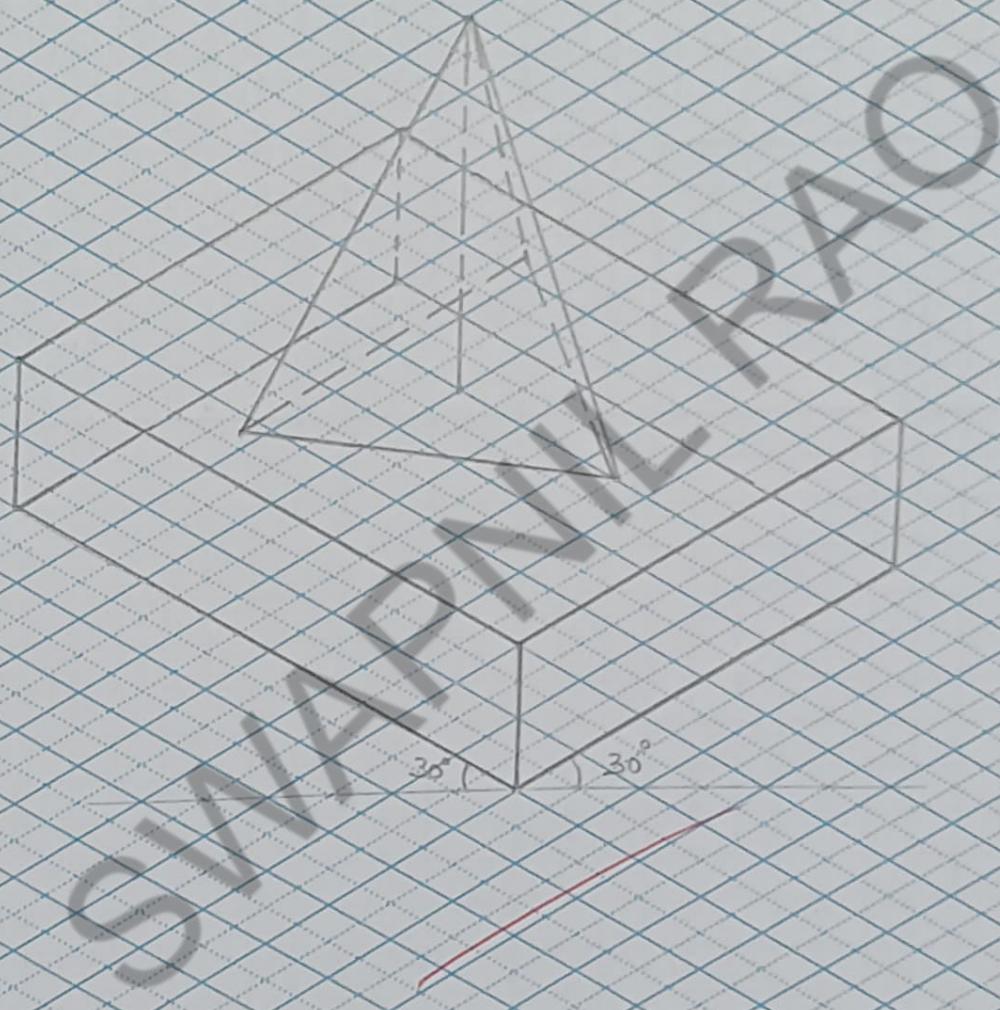


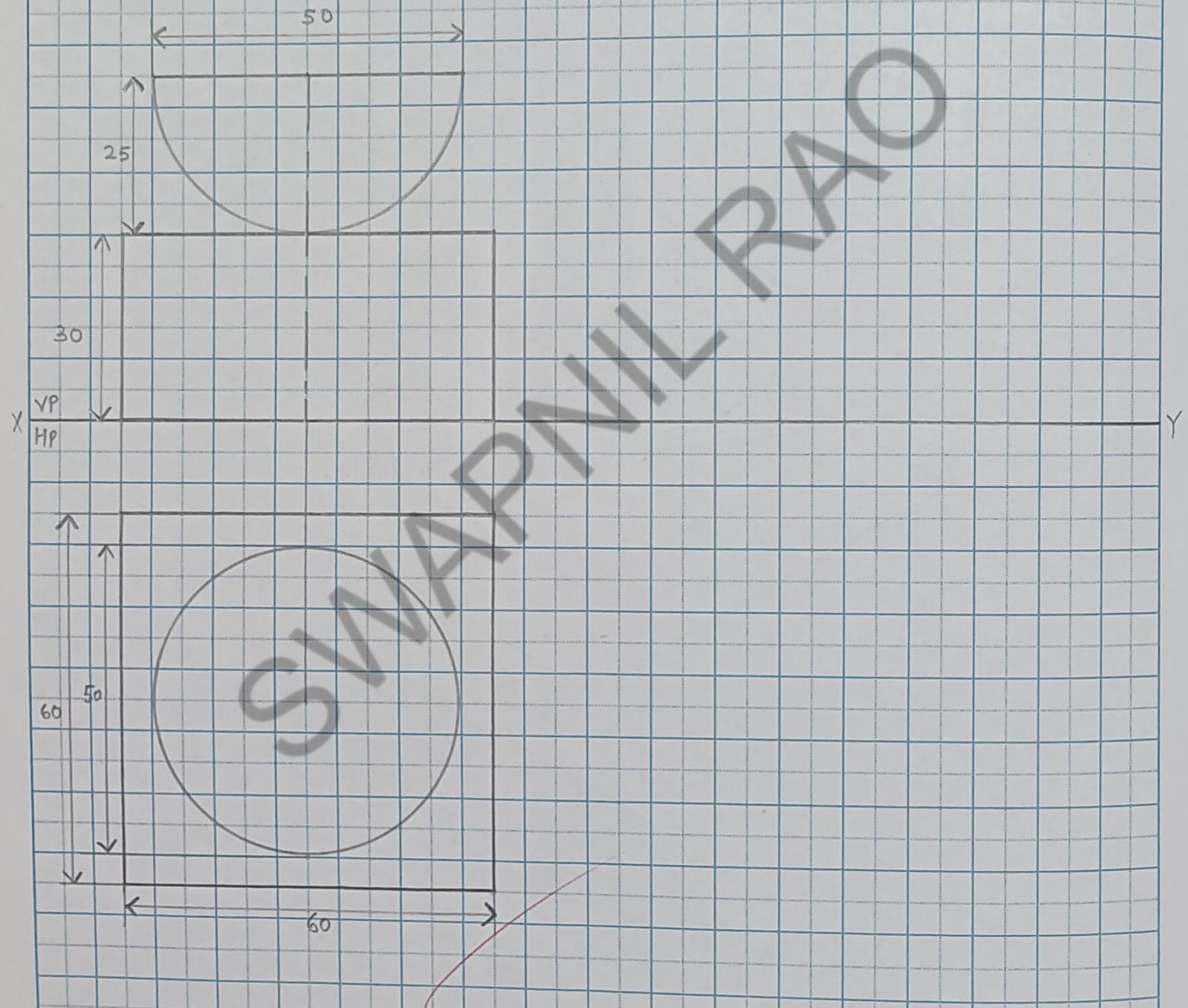
CHRONIQUE

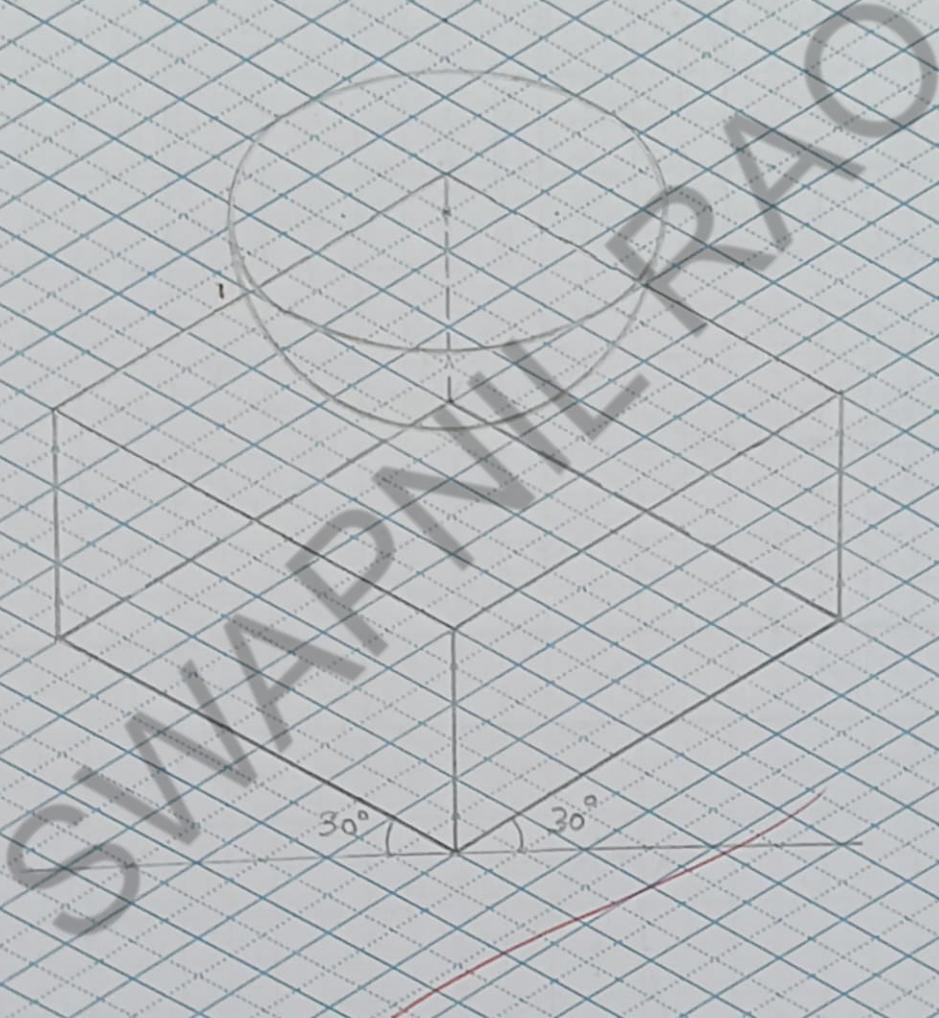
30° 30°

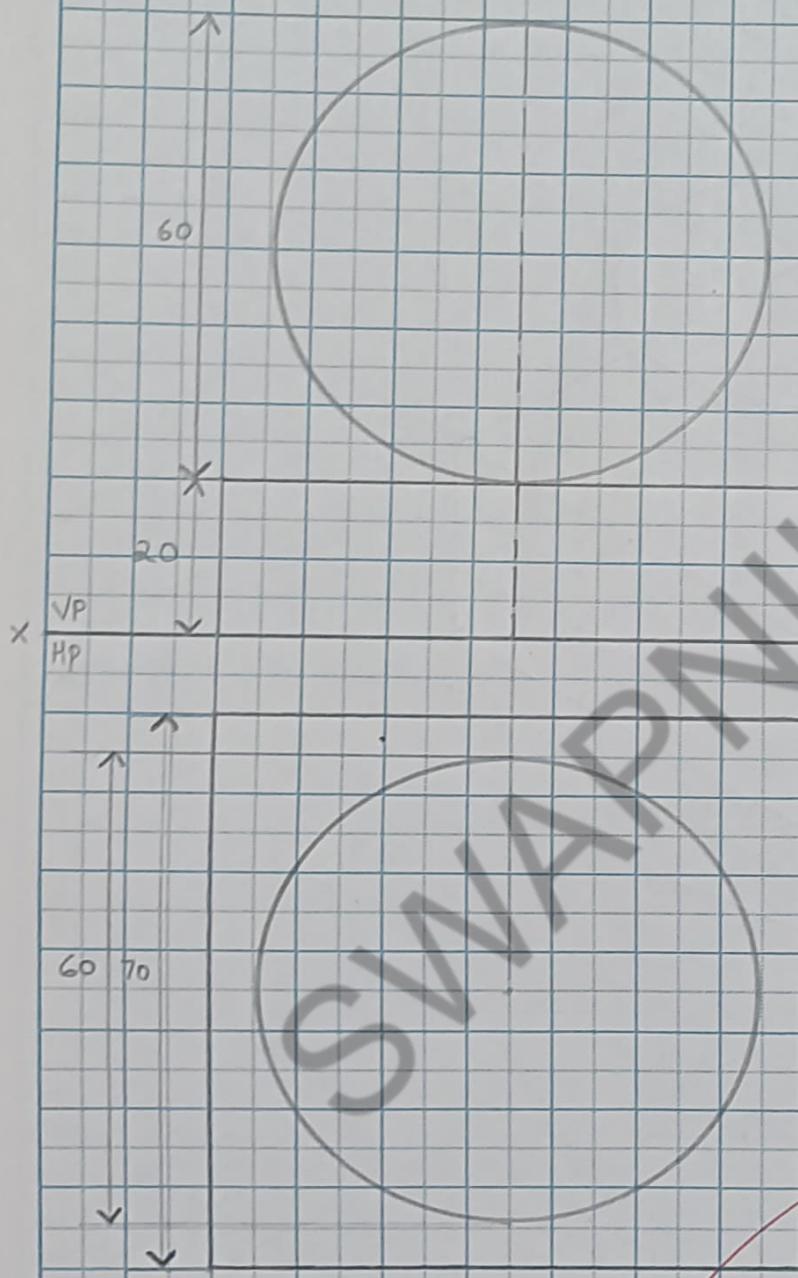












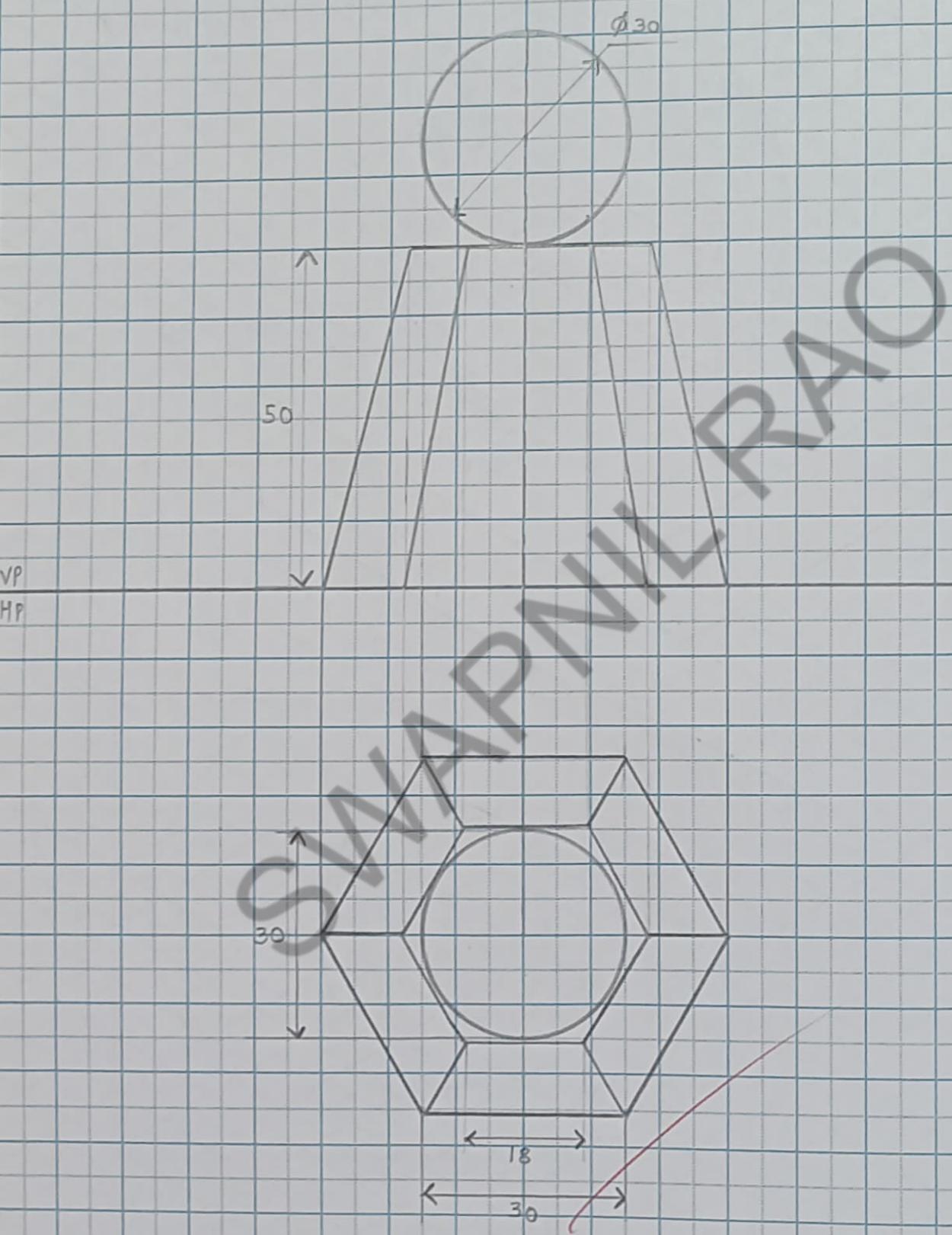
True radius of 60°

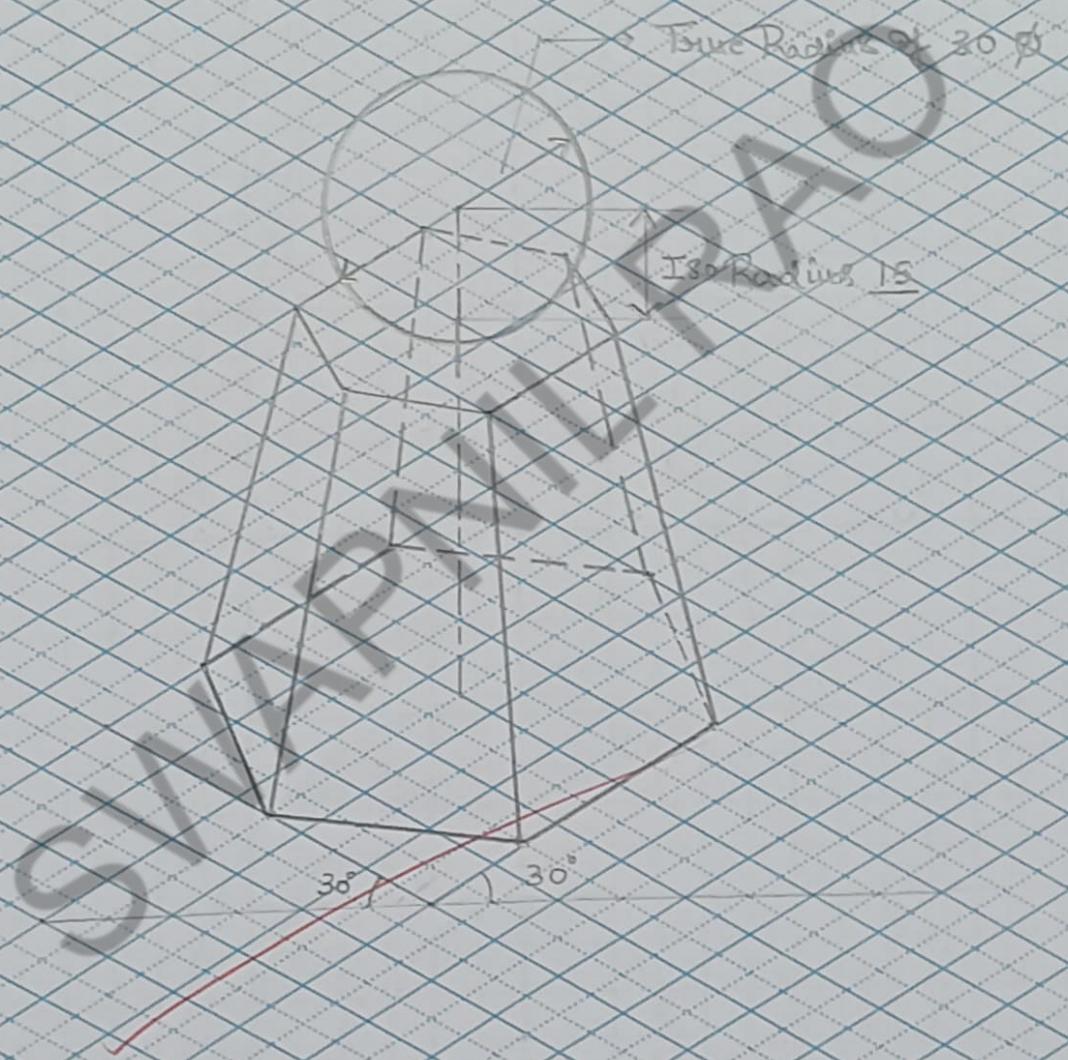
100 Radii 3.0

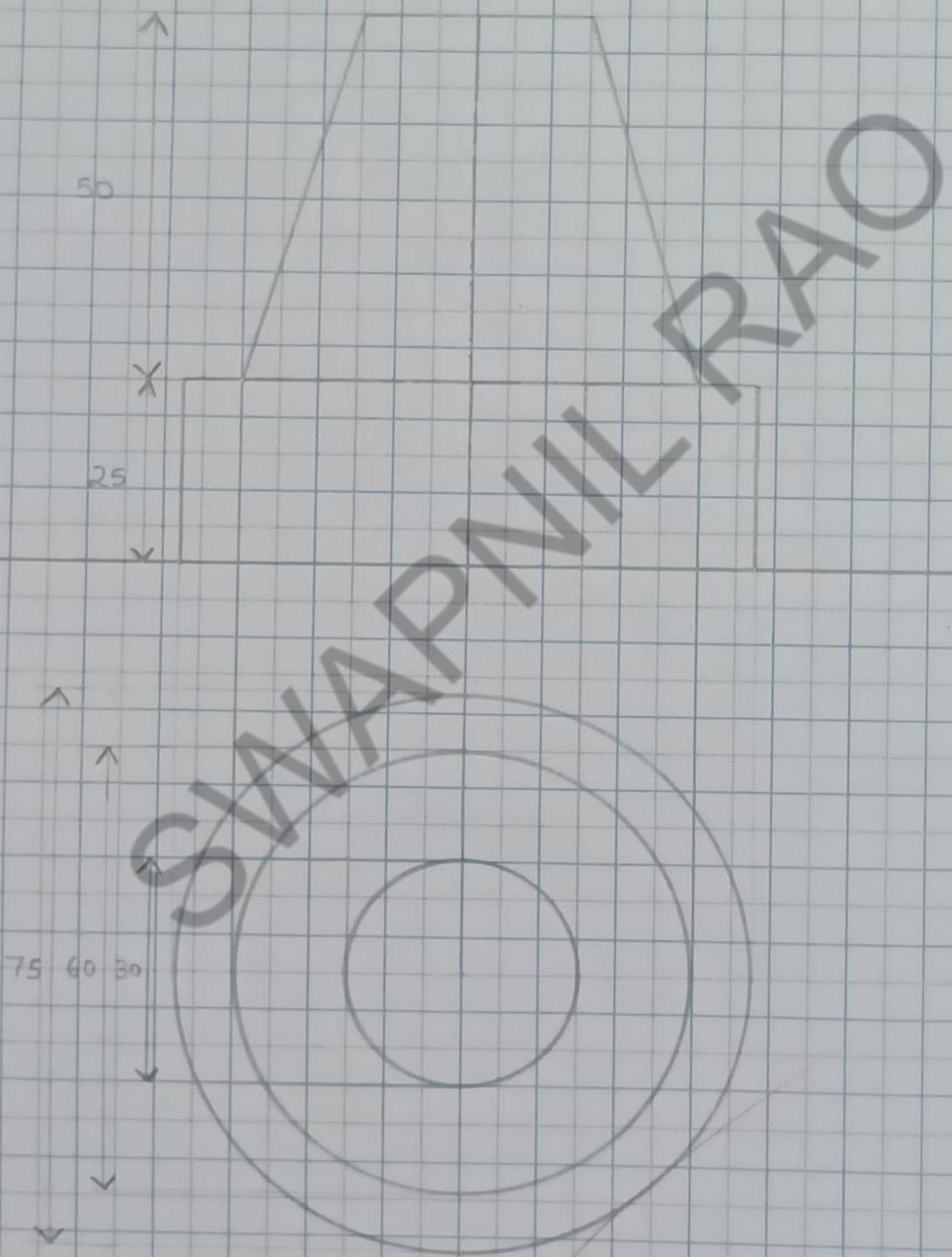
SWARAJ RAO

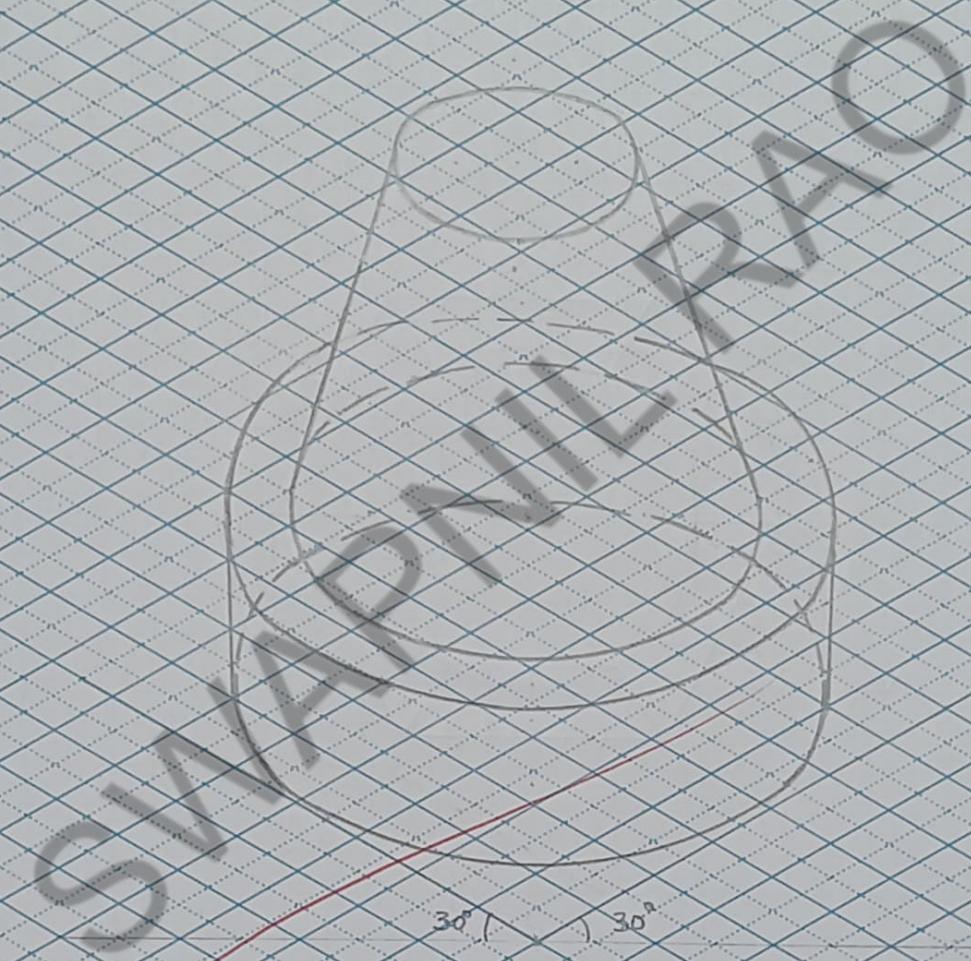
30°

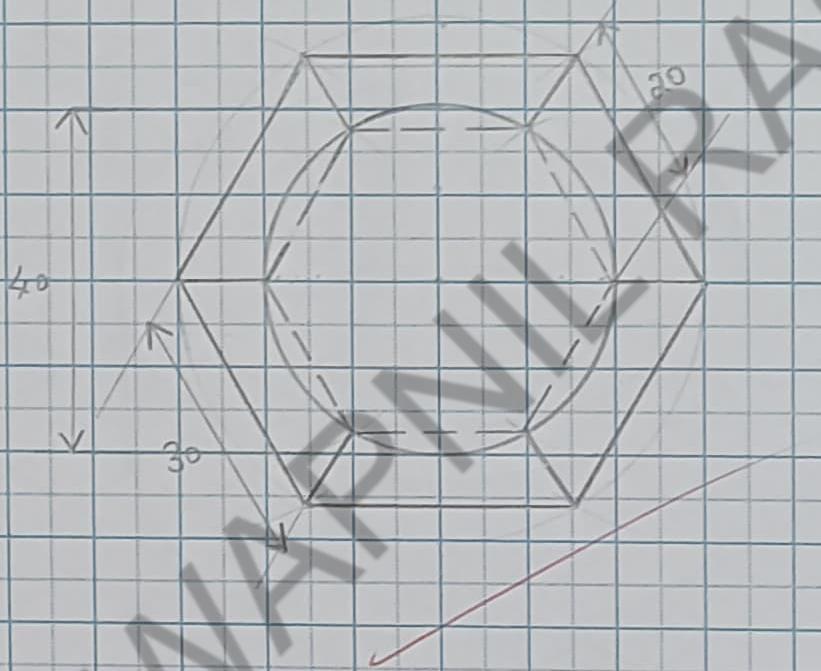
30°











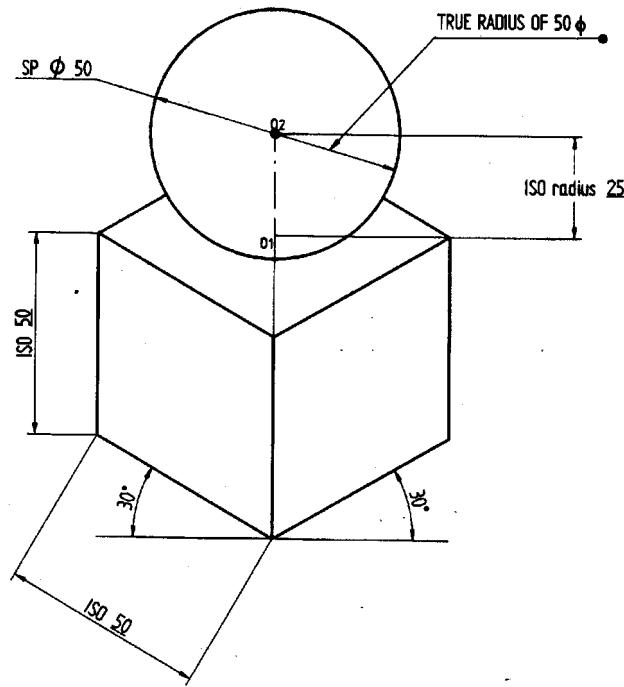


CHAPTER 6

ISOMETRIC PROJECTION

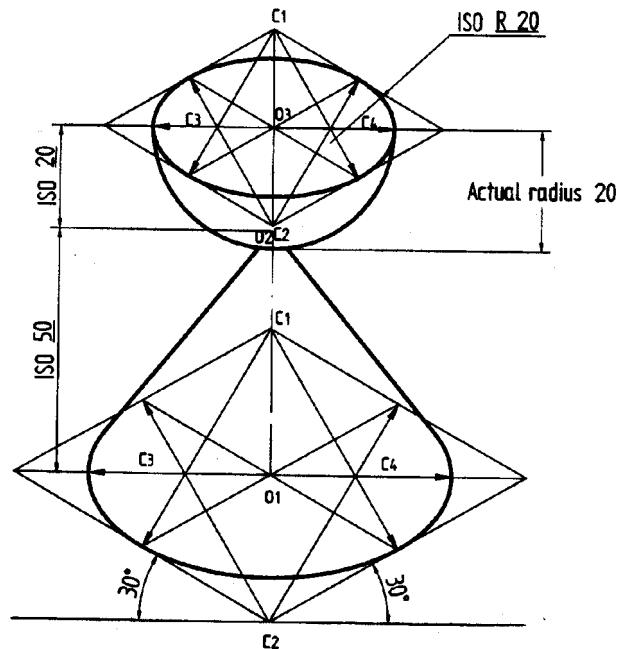
Problem 1 A sphere of diameter 50 mm rests centrally on top of a cube of sides 50 mm. Draw the Isometric projections of the combination of solids.

Solution



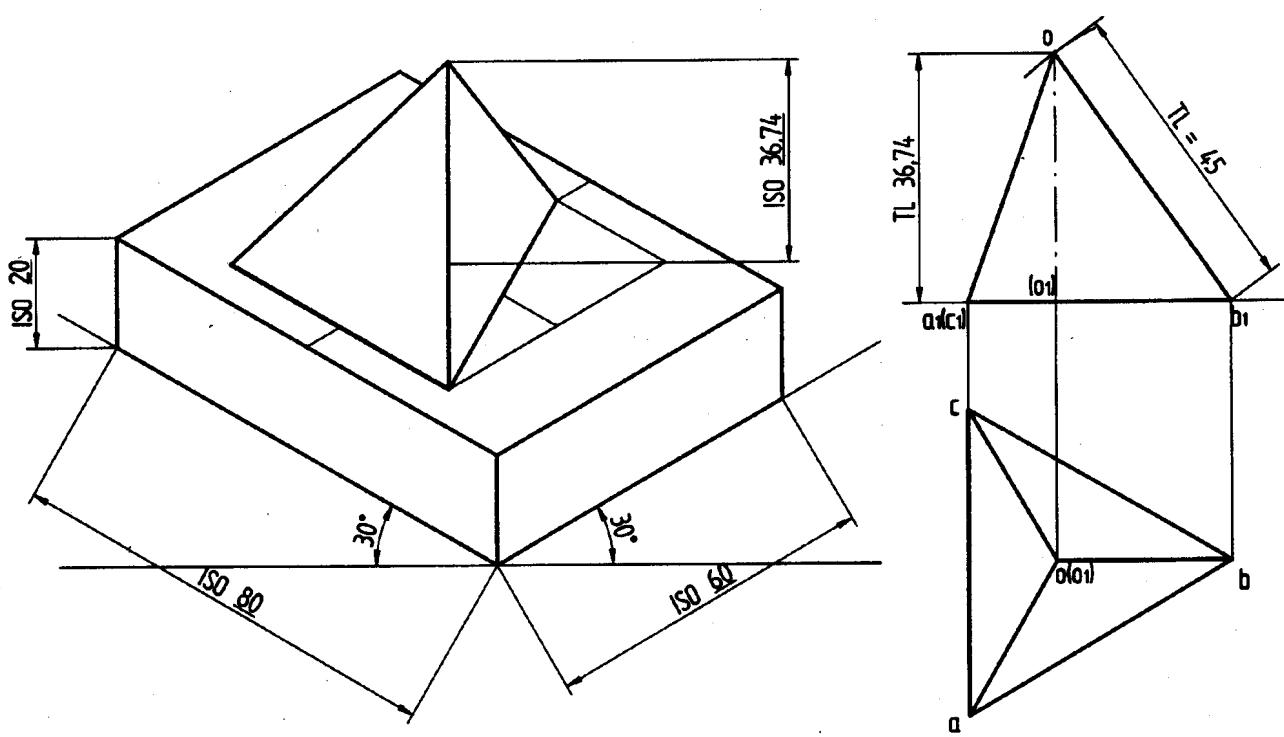
Problem 2 A hemisphere of 40 mm diameter is supported co-axially on the vertex of a cone of base dia. 60 mm and axis length 50 mm. The flat circular face of the hemisphere is facing upside. Draw the isometric projection of the combination of solids.

Solution



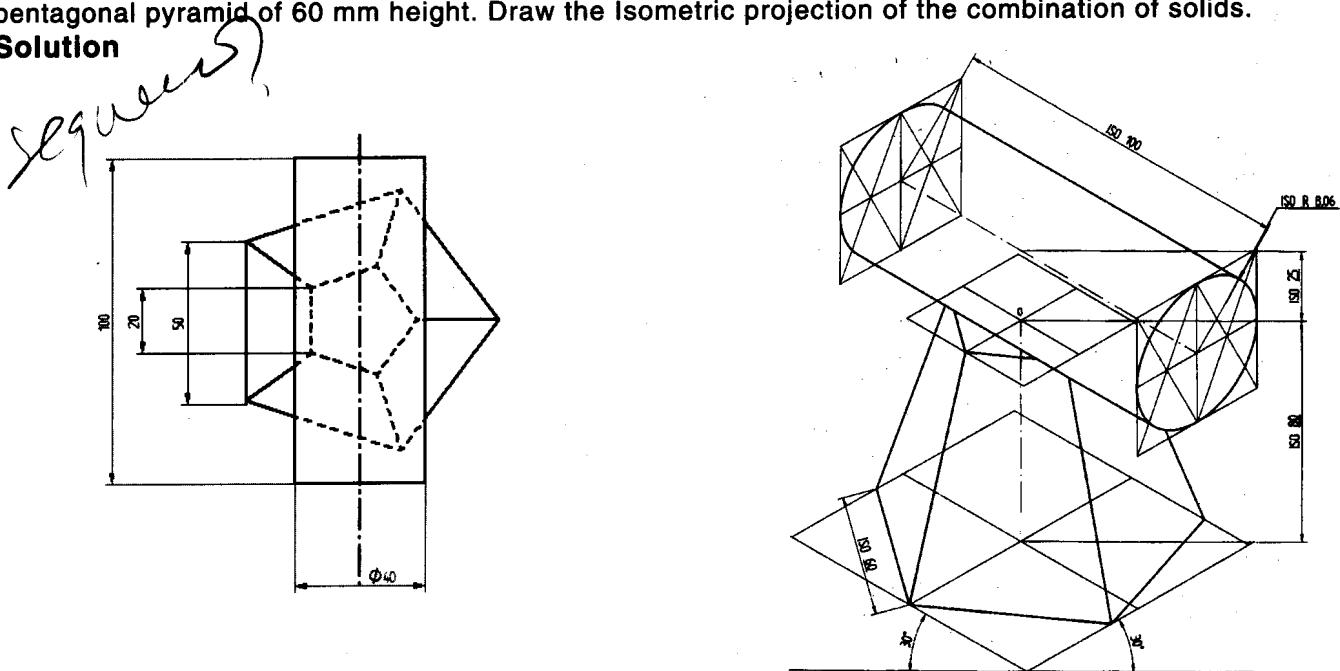
Problem 3 Draw the Isometric projection of a rectangular prism of $60 \times 80 \times 20$ mm thick surmounting a tetrahedron of sides 45 mm such that the axes of the solids are collinear and at least one of the edges of both the solids are parallel to VP. Solved examples 6.1 p140, 6.2 p143, 6.3 p146, 6.4 p150 and 6.5 p156 of primer

Solution



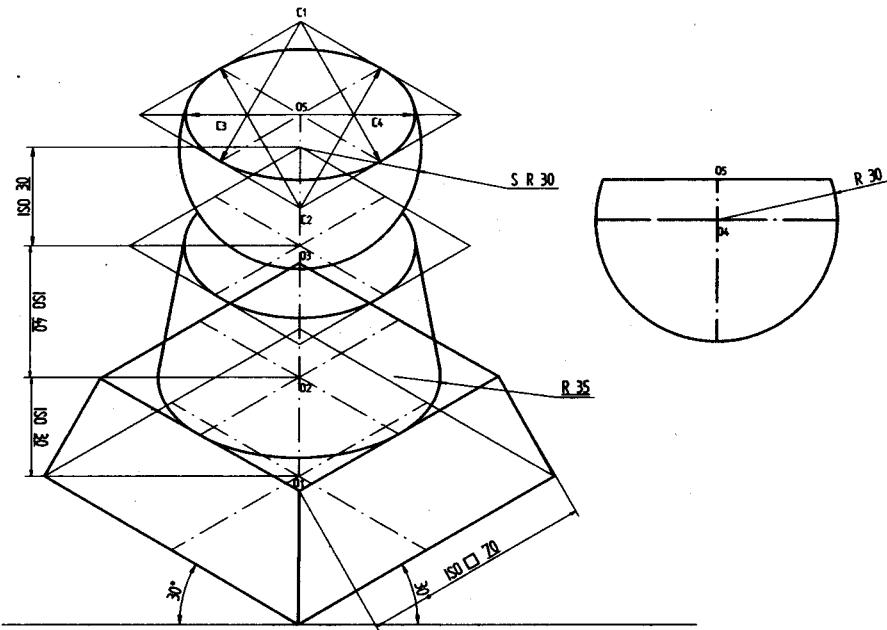
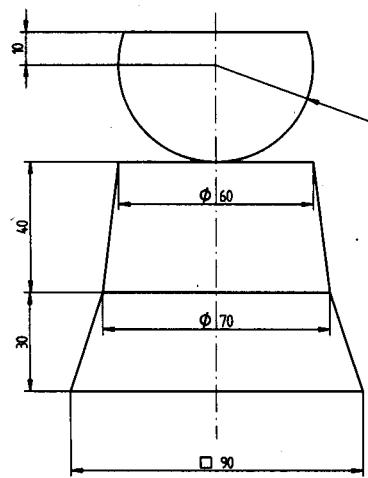
Problem 4 Following figure shows the top view of a cylinder which is centrally mounted on a frustum of a pentagonal pyramid of 60 mm height. Draw the Isometric projection of the combination of solids.

Solution



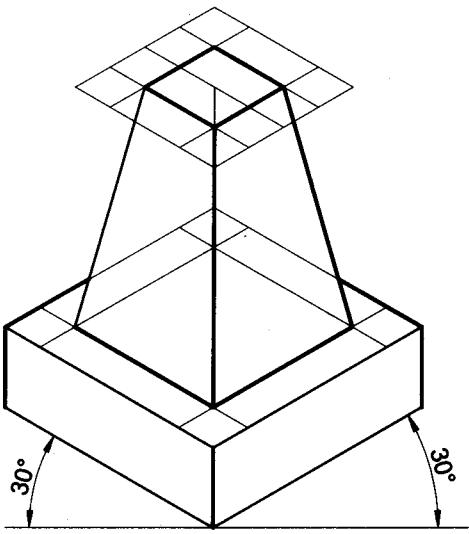
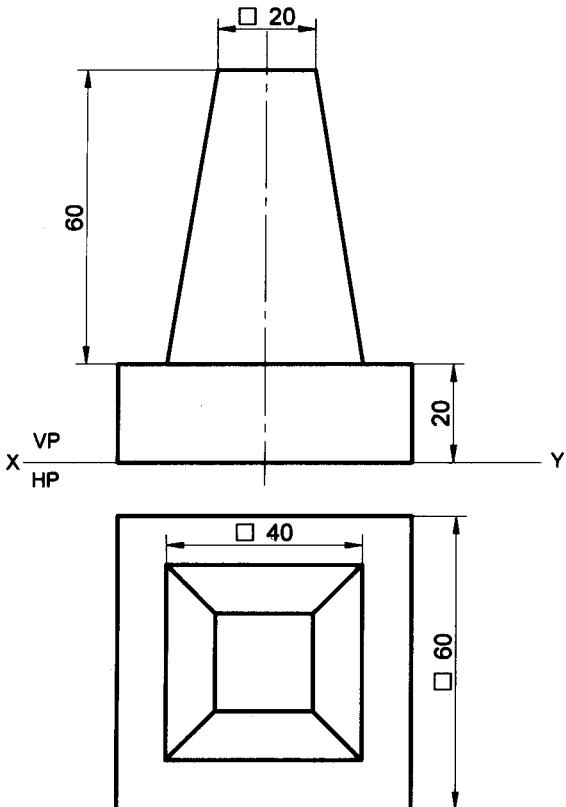
Problem 5 Following figure shows the front view of combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the Isometric projection of the combination of solids.

Solution



Problem 6 The frustum of a square pyramid of sides 40mm and height 60mm rest on the centre of the top of a square block of side 60mm and height 20mm. The base edges of the pyramid are parallel to the top edges of the square block. Draw the isometric projection of the combination of the solids.

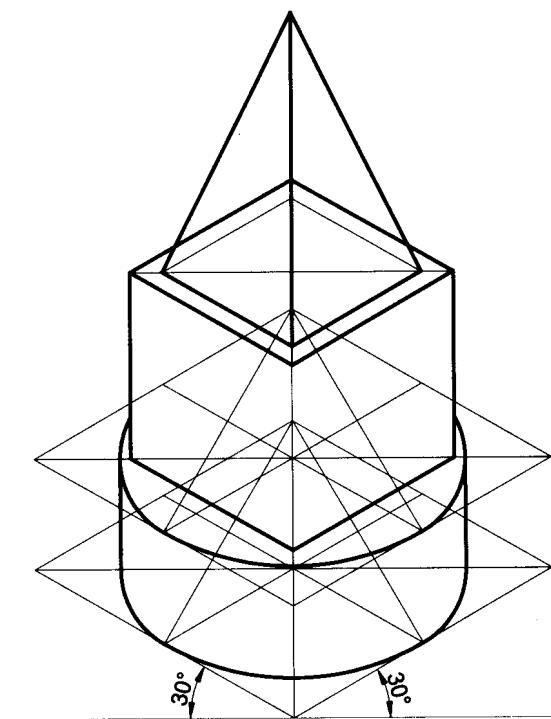
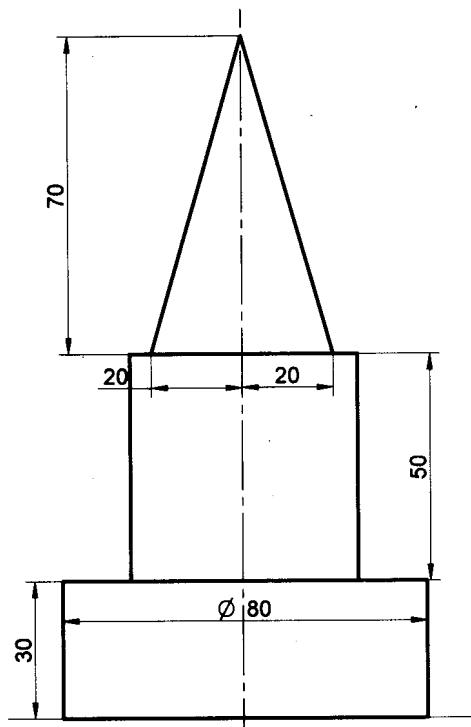
Solution



June 2009

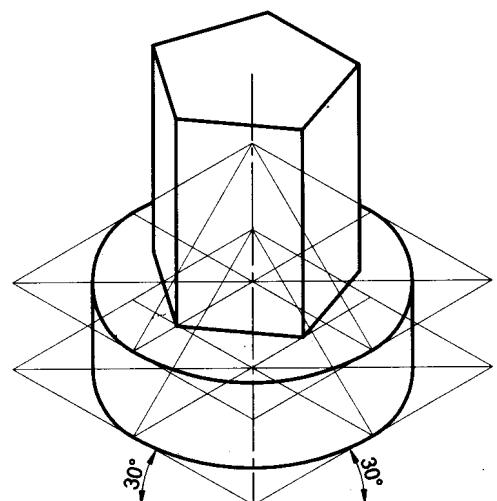
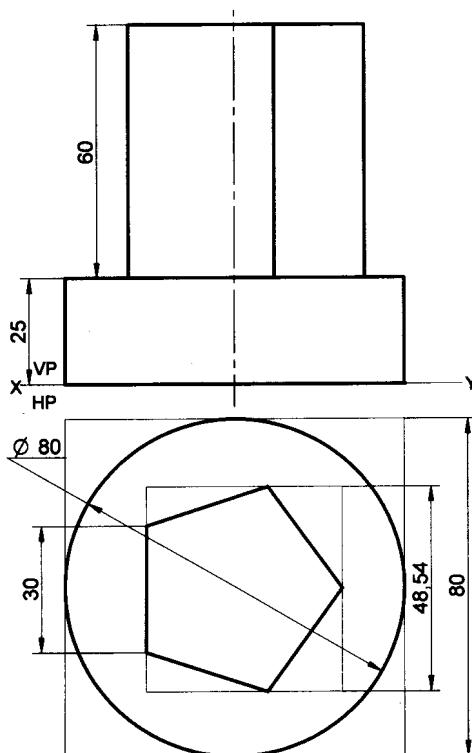
Problem 7 A square pyramid of base side 40mm and height 70mm rests symmetrically on a cube of edge 50mm, which itself is placed on a cylinder of diameter 80mm and thickness 30mm. Draw the isometric projection of the solids, if the axes of the three solids are in common line.

Solution



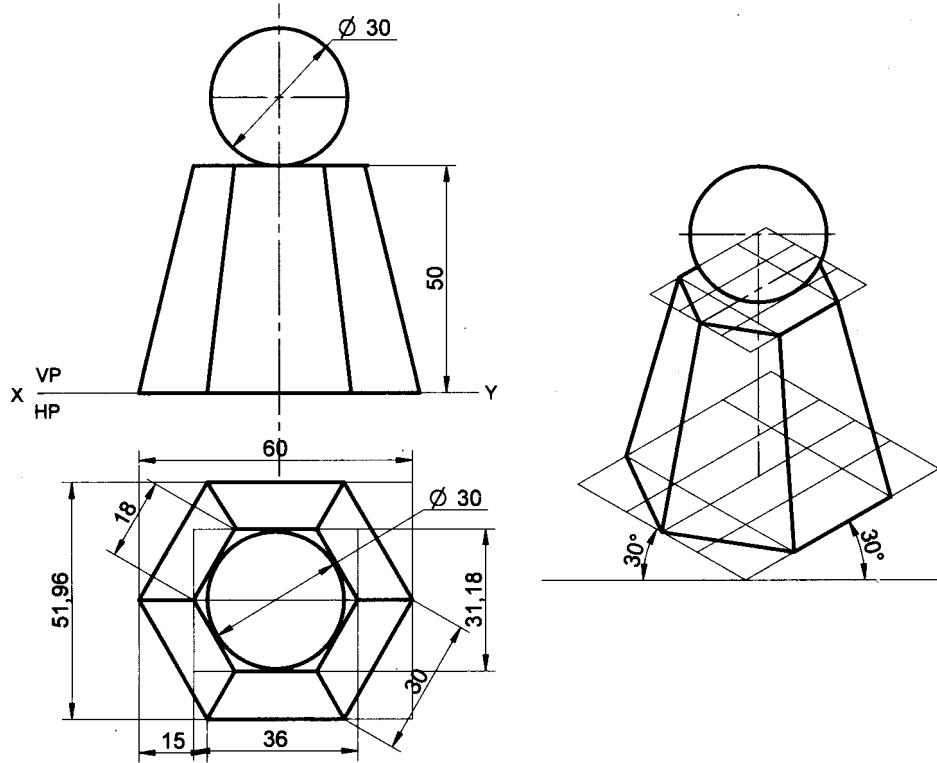
Problem 8 A regular pentagonal prism of base edge 30mm and axis 60mm is mounted centrally over a cylindrical block of 80mm diameter and 25mm thick. Draw isometric projection of the combined solids.

Solution



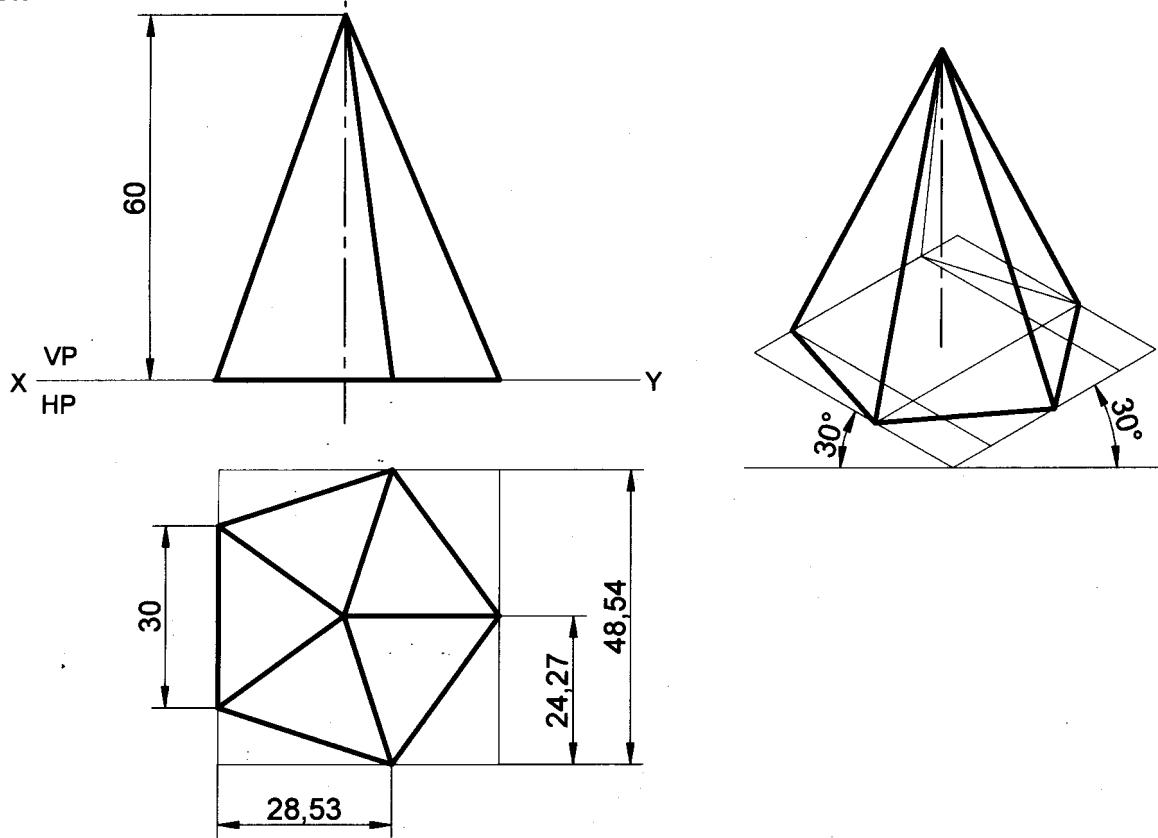
Problem 9 A sphere of diameter 30mm rests on the frustum of a hexagonal pyramid base 30mm, top face 18mm side and height 50mm, such that their axes coincide. Draw the isometric projection of the combined solids.

Solution



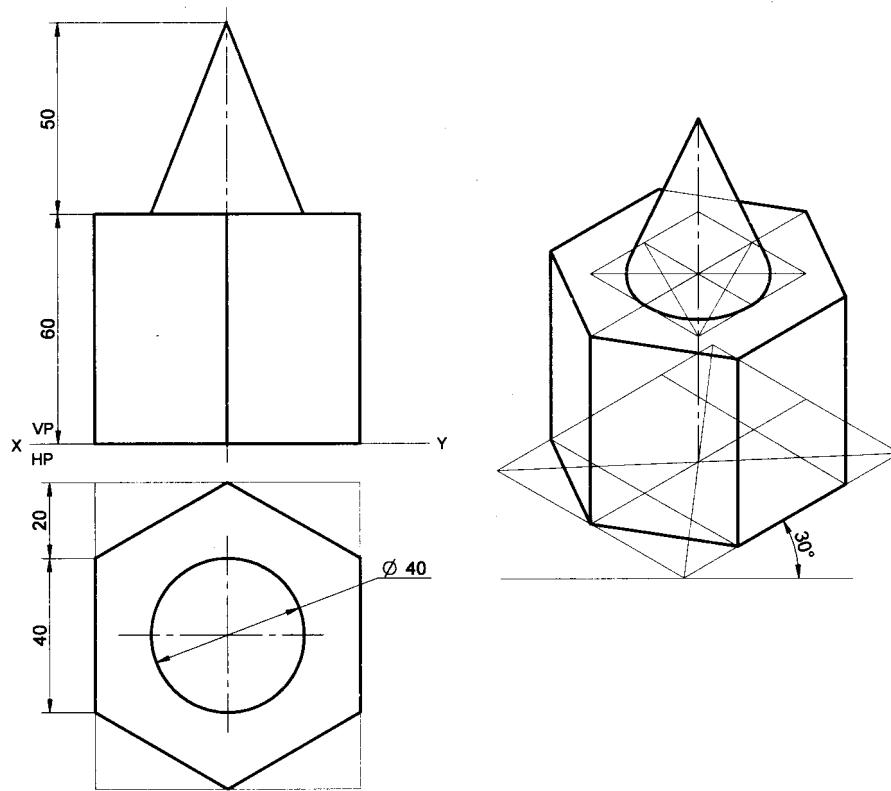
Problem 10 A pentagonal pyramid of base side 30mm and axis length 60mm is resting on HP on its base with a side of base perpendicular to VP. Draw its isometric projections

Solution



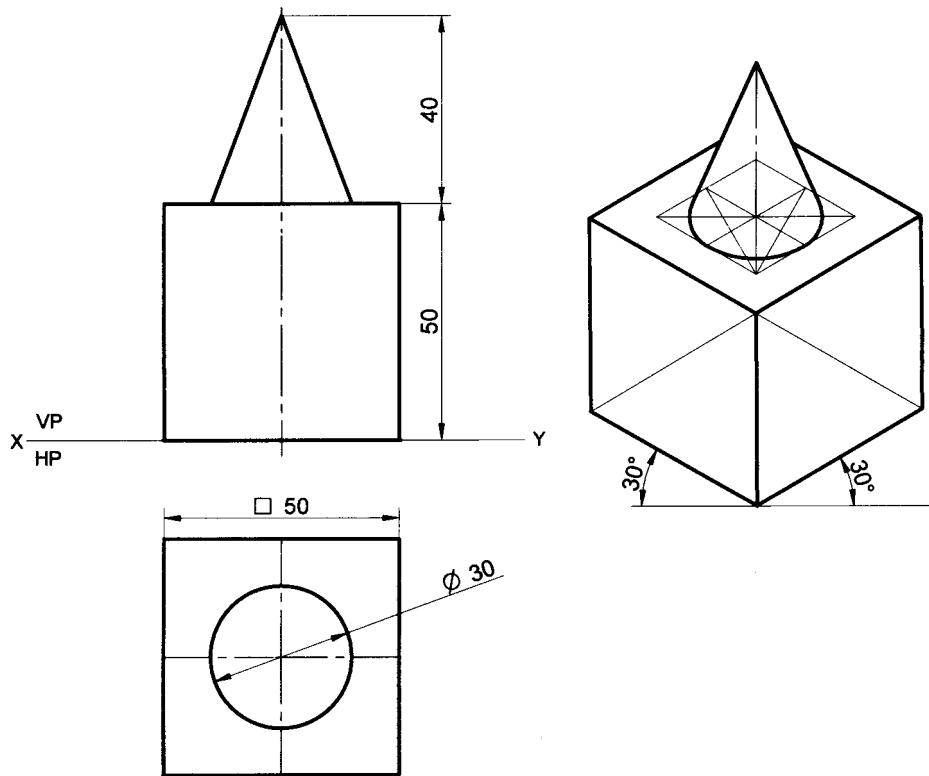
Problem 11 Draw isometric projection of a hexagonal prism of side of base 40mm and height 60mm with a right circular cone of base 40mm as diameter and altitude 50mm, resting on its top such that the axes of both the solids are collinear.

Solution



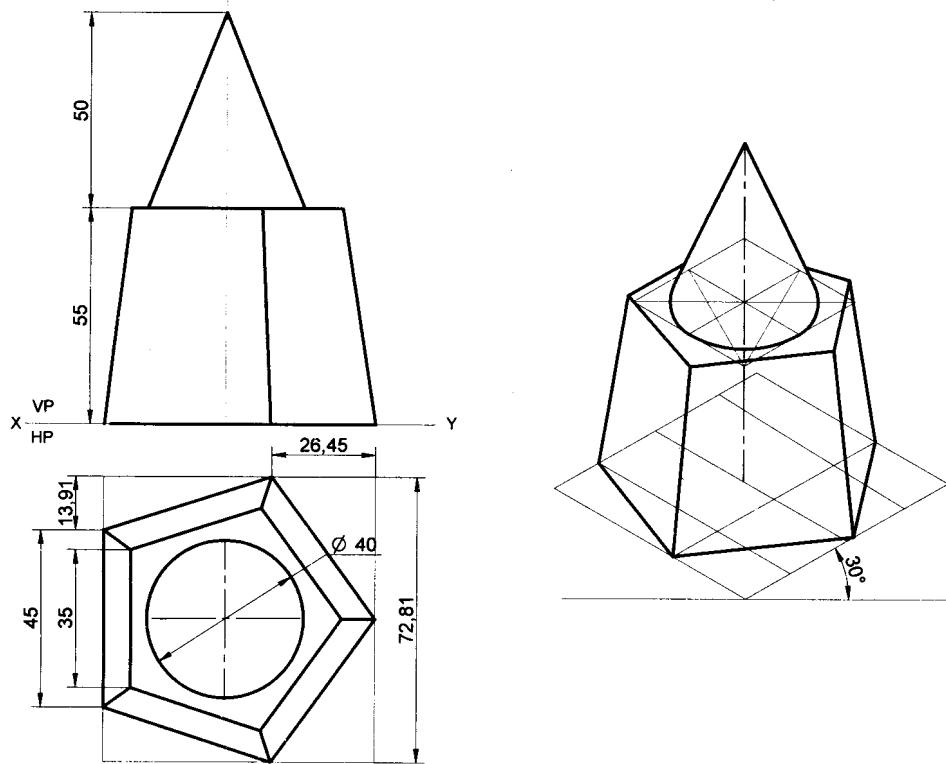
Problem 12 A cone of base diameter 30mm and height 40mm rests centrally over a cube of side 50mm. Draw the isometric projection of the combination of solids

Solution



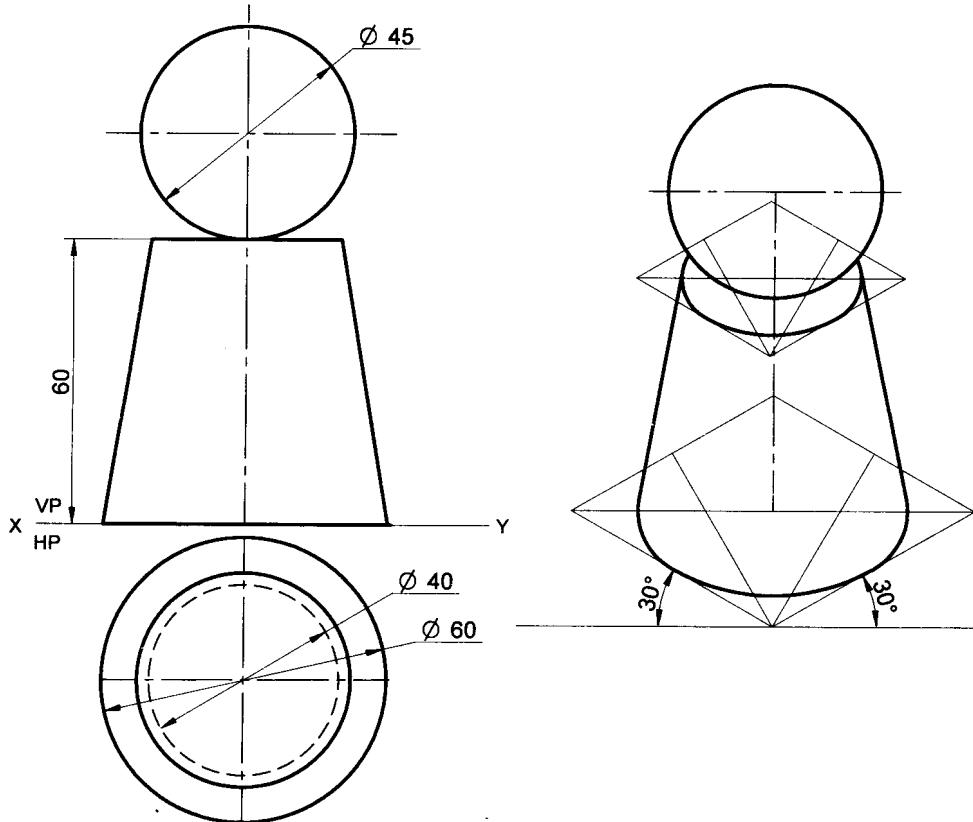
Problem 13 A cone of base diameter 40mm and height 50mm rests centrally over a frustum of a pentagonal pyramid of base side 45mm and top side 35mm and height 55mm. Draw isometric projections of the solids.

Solution



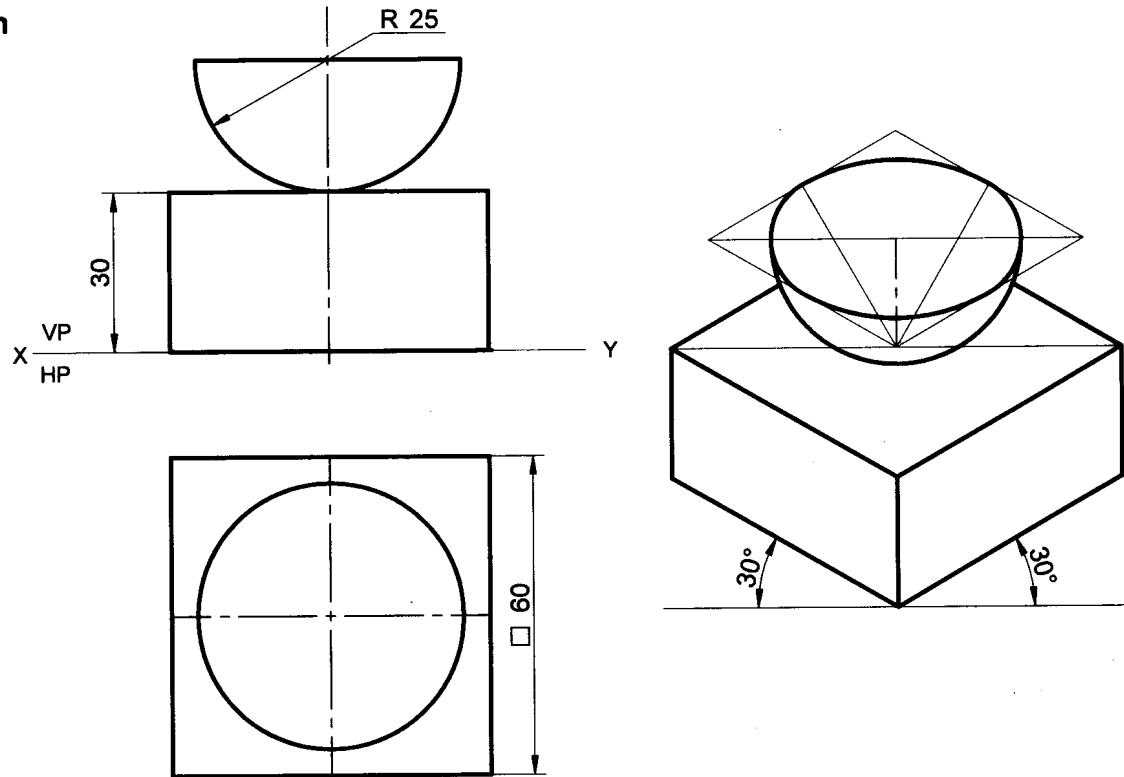
Problem 14 A sphere of diameter 45mm rests centrally over a frustum of cone of base diameter 60mm, top diameter 40mm and height 60mm. Draw its isometric projections.

Solution



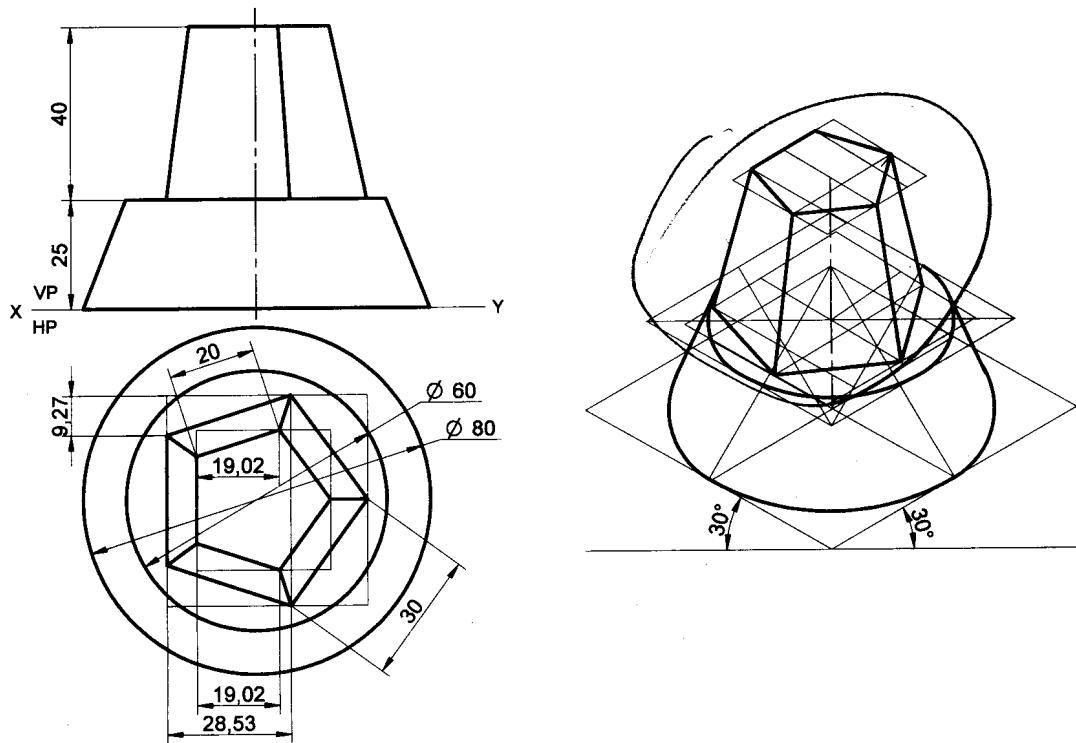
Problem 15 A hemisphere of diameter 50mm is centrally resting on top of a square prism of base side 60mm and height 30mm such that the curved surface of hemisphere is touching the top face of the prism. Draw its isometric projections

Solution



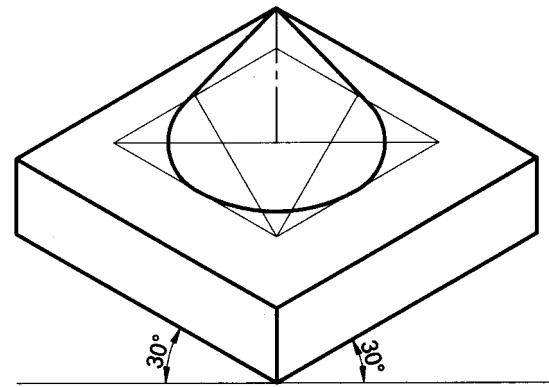
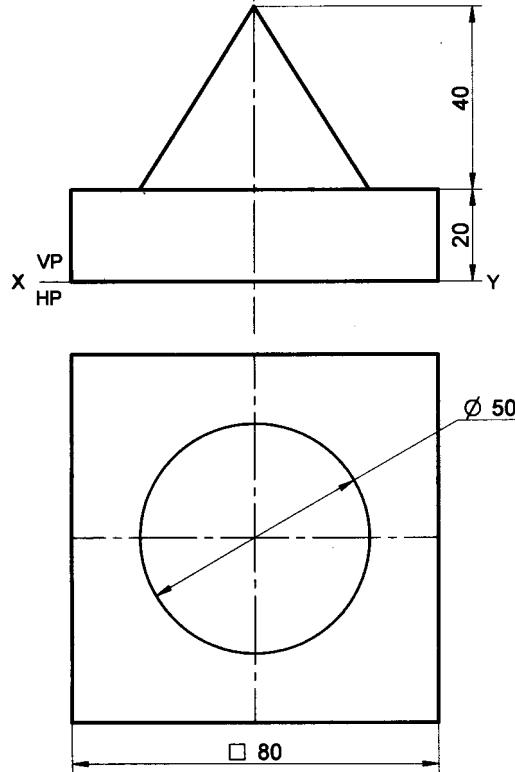
Problem 16 Draw the isometric projection of the combination of solids formed by a frustum of cone and co-axial frustum of pentagonal pyramid. The lower frustum of cone is of 80mm base diameter, 60mm top diameter and height 25mm. The upper frustum of pyramid is of 30mm side of base, 20mm side of top face and height 40mm.

Solution



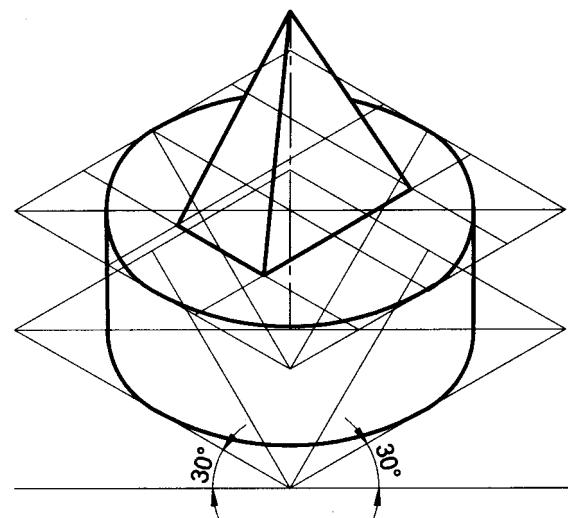
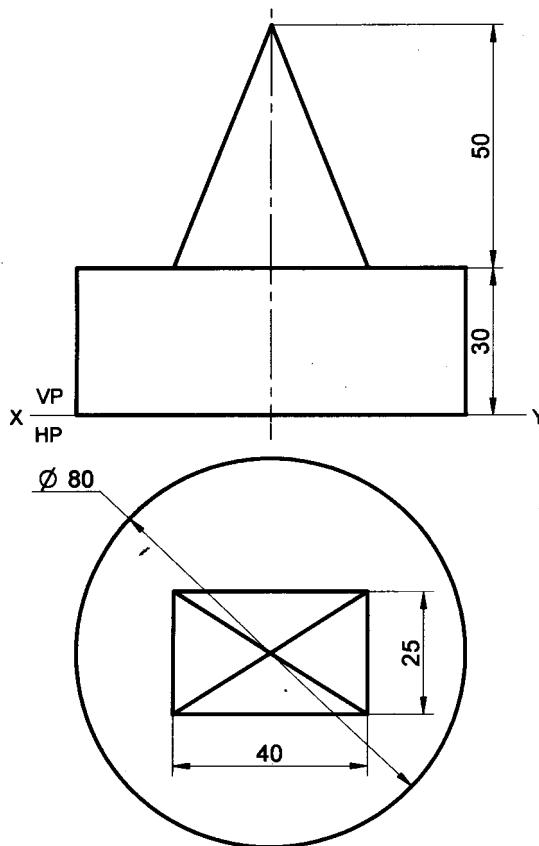
Problem 17 A cone of base diameter 50mm and height 40mm is placed centrally on the top face of a square slab side-80mm and height 20mm. Draw the isometric projection of the combination

Solution



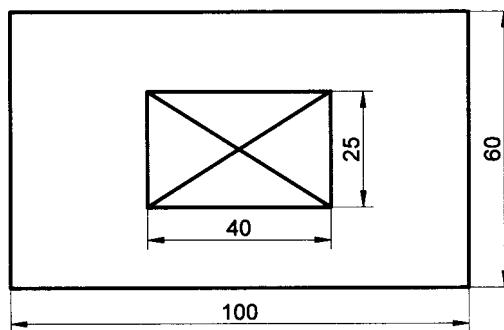
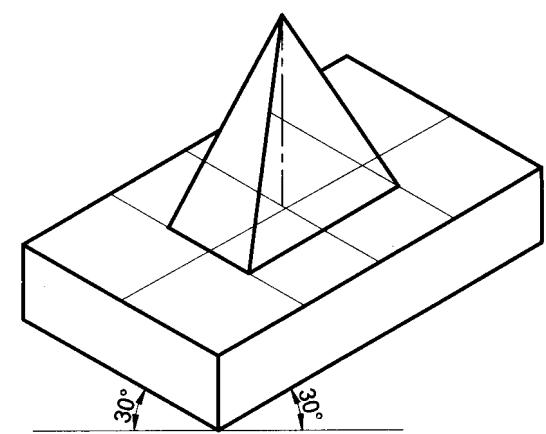
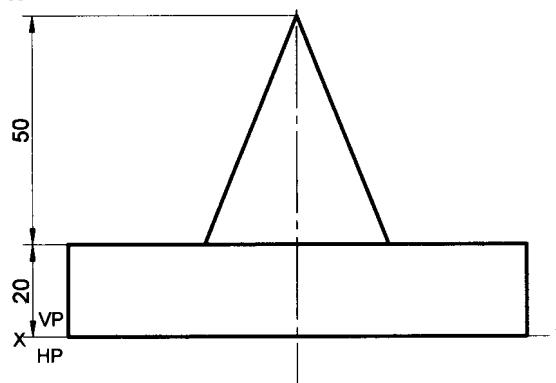
Problem 18 A rectangular pyramid of base-40mmx25mm and height 50mm is placed centrally on a cylindrical slab of diameter 100mm and thickness-30mm. Draw the isometric projection of the combination

Solution



Problem 19 A rectangular pyramid of base-40mmx25mm and height50mm is placed centrally on a rectangular slab sides-100mmx60mm and thickness-20mm. Draw the isometric projection of the combination

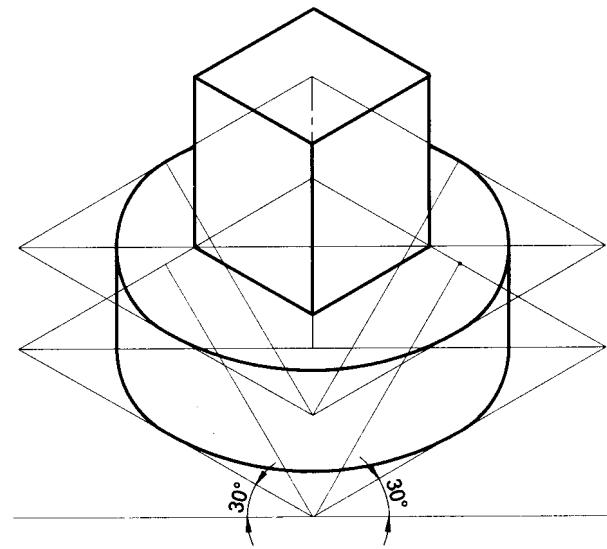
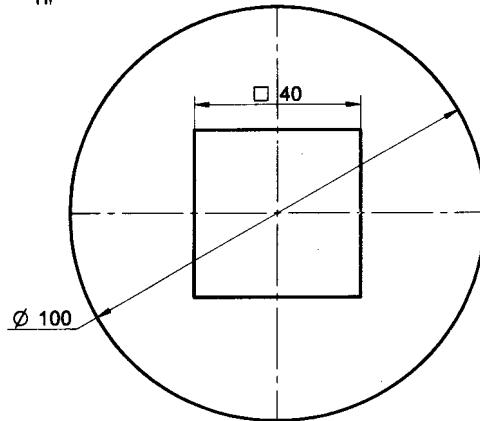
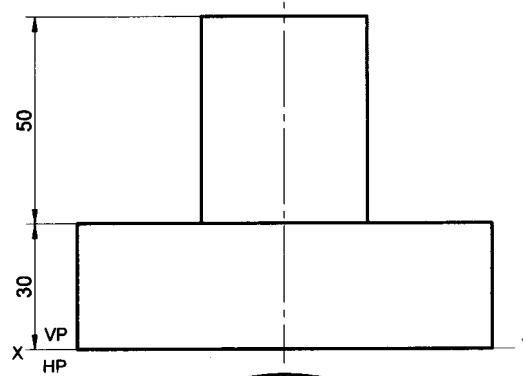
Solution



2

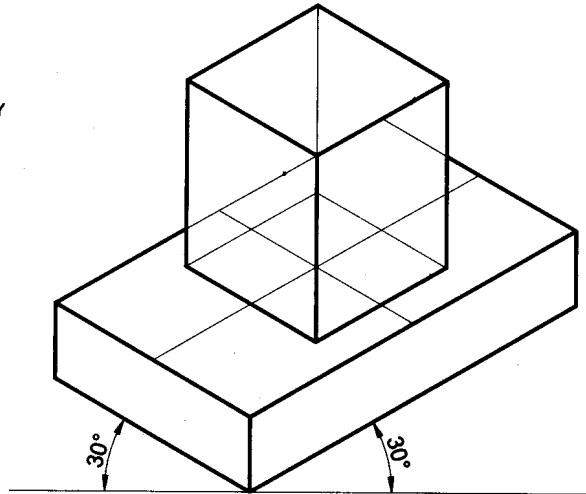
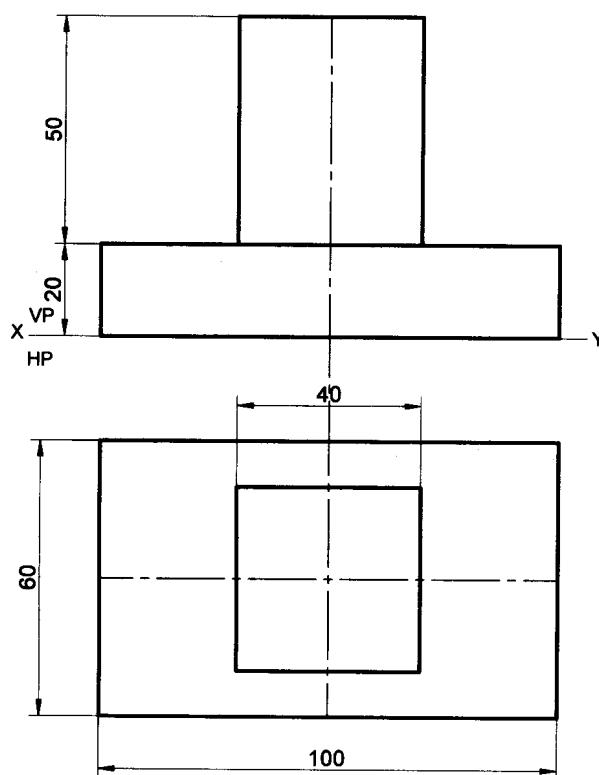
Problem 20 A square prism base side-40mm, height50mm is placed centrally on a cylindrical slab of diameter 100mm and thickness-30mm. Draw the isometric projection of the combination

Solution



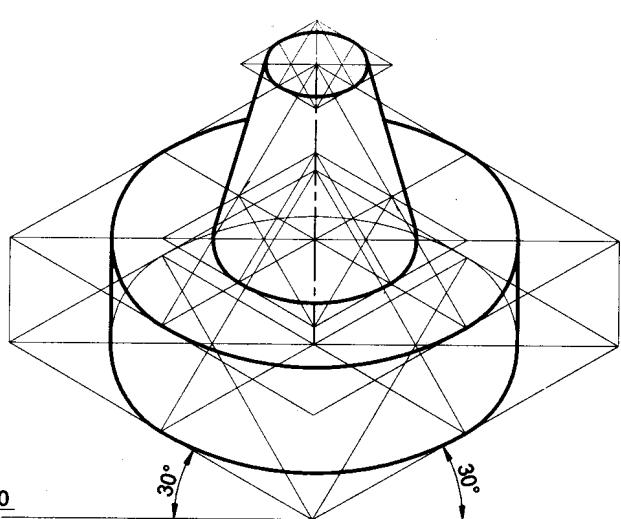
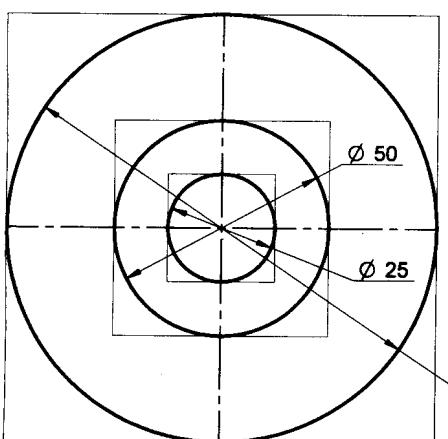
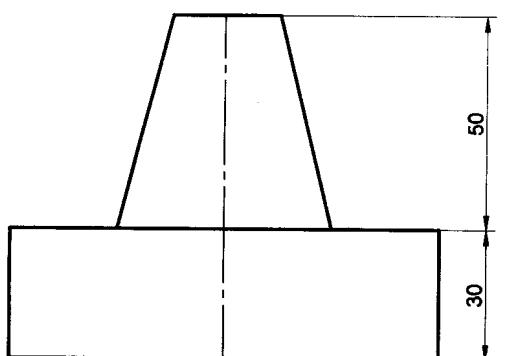
Problem 21 A square prism base side-40mm, height50mm is placed centrally on a rectangular slab sides-100mmx60mm and thickness-20mm. Draw the isometric projection of the combination

Solution



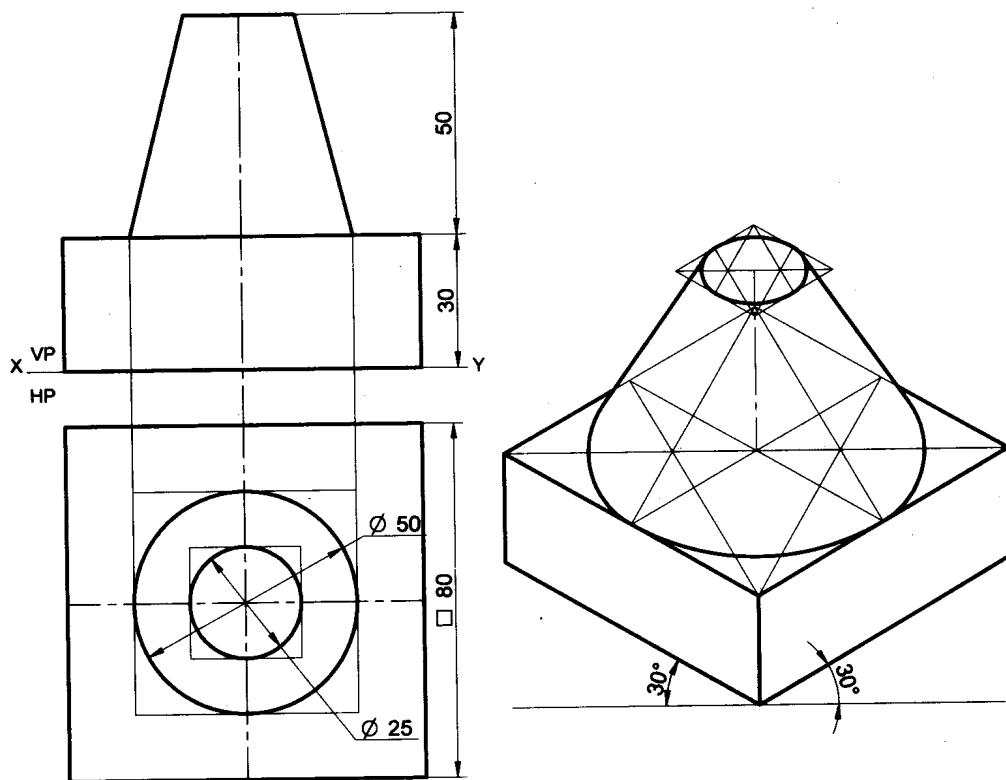
Problem 22 A frustum of cone base diameter 50mm, top diameter 25mm and height50mm is placed centrally on a cylindrical slab of diameter 100mm and thickness-30mm. Draw the isometric projection of the combination

Solution



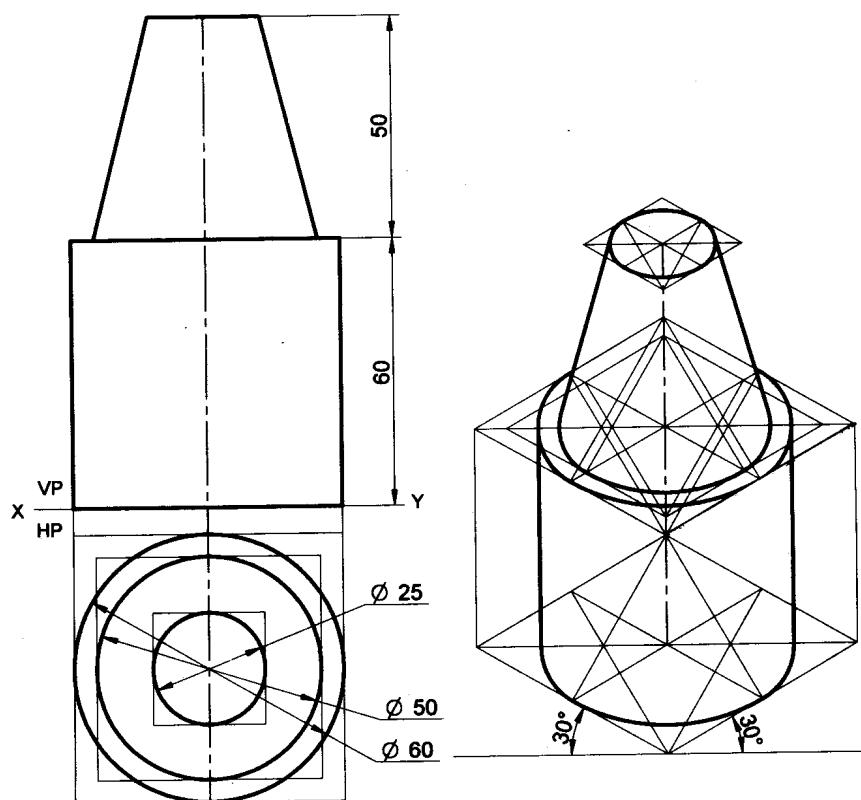
Problem 23 A frustum of cone base diameter 50mm, top diameter 25mm and height 50mm is placed centrally on a square slab side-80mm and thickness-30mm. Draw the isometric projection of the combination.

Solution



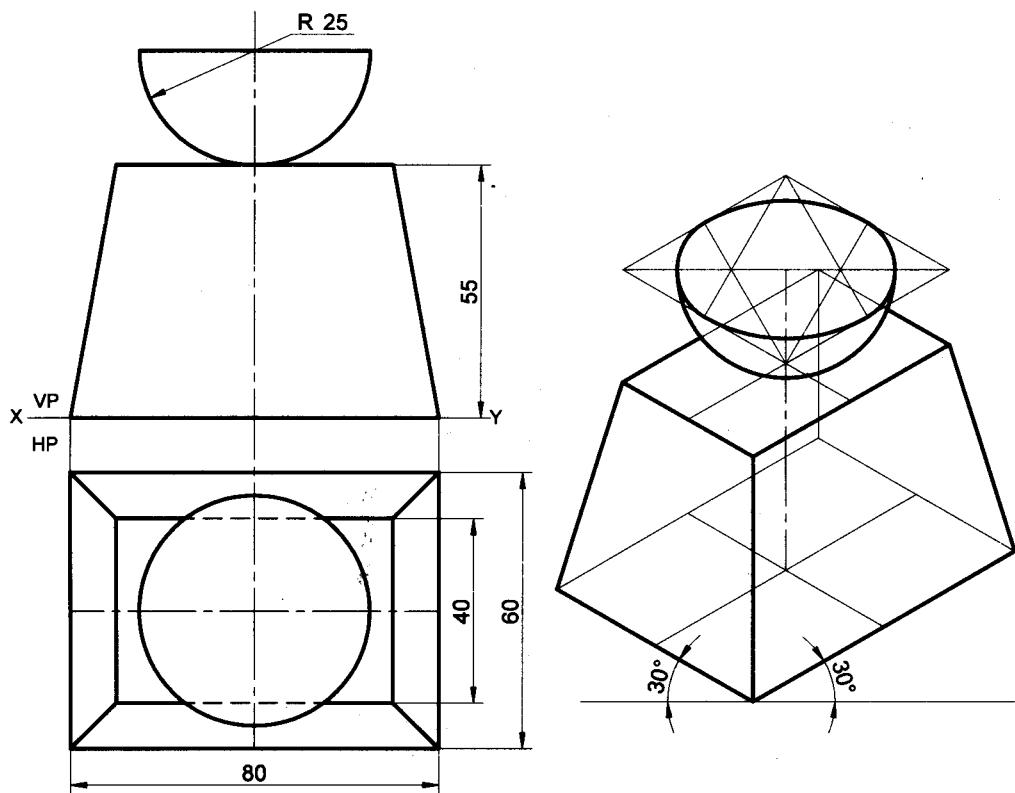
Problem 24 A frustum of cone base diameter 50mm, top diameter 25mm and height 50mm is placed centrally on the top face of a cylinder diameter 60mm and height 60mm. Draw the isometric projection of the combination

Solution



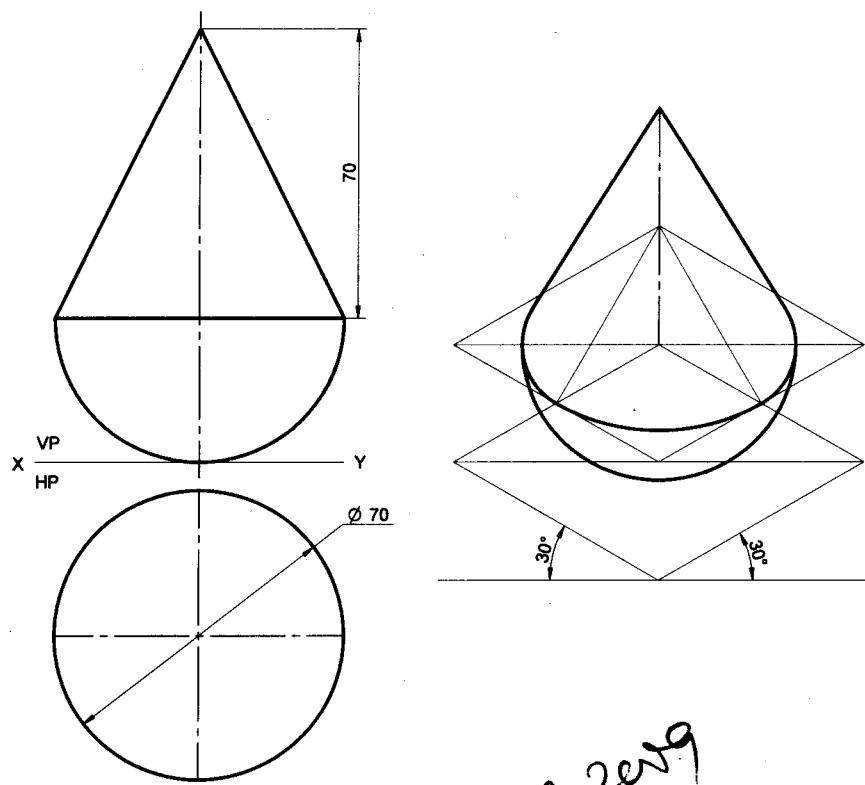
Problem 25 A hemisphere diameter 50mm is resting on its curved surface centrally on the top face of frustum of a rectangular pyramid base-80mmx60mm and top-60mmx40mm, height 55mm. Draw the isometric projection of the combination

Solution



Problem 26 A hemisphere diameter 70mm is placed on the ground on its curved surface. A cone base diameter 70mm and height 70mm is placed centrally on it. Draw the isometric projection of the combination

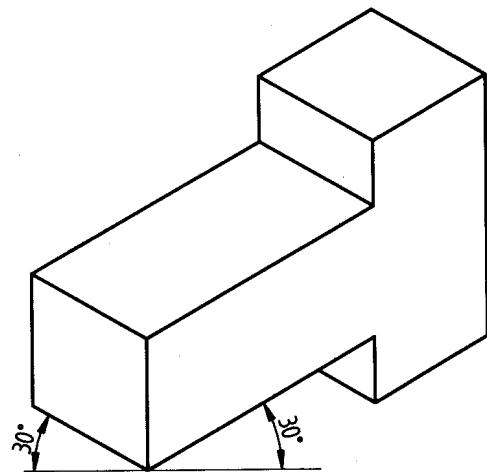
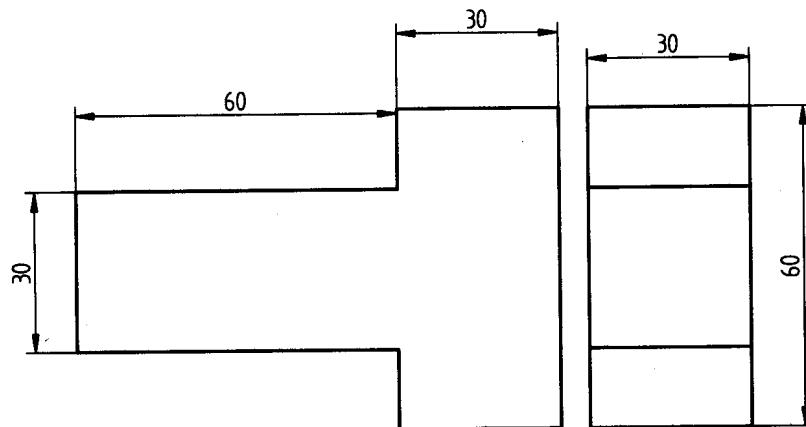
Solution



June 2029

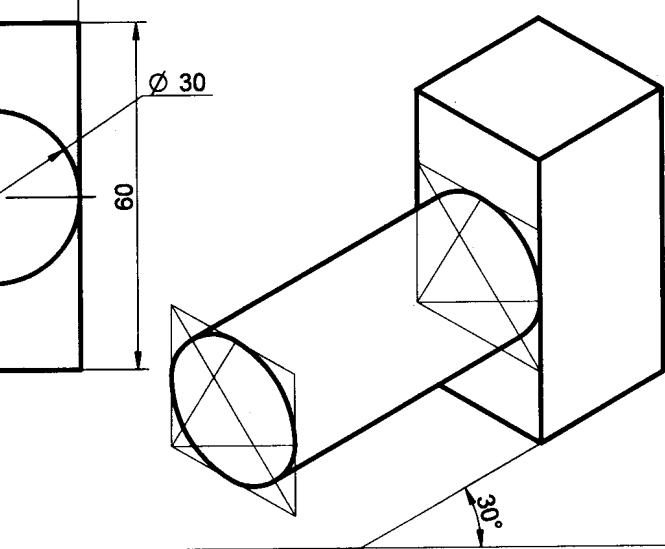
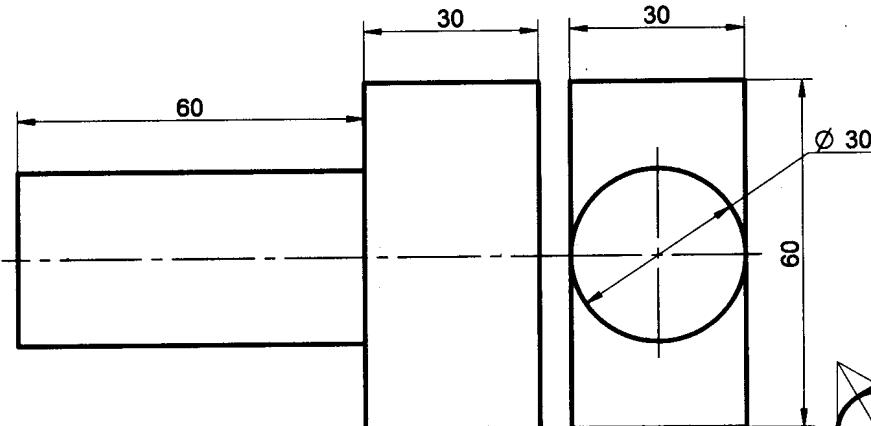
Problem 27 Following figure shows the front and side views of solid. Draw the Isometric projection of the solid.

Solution



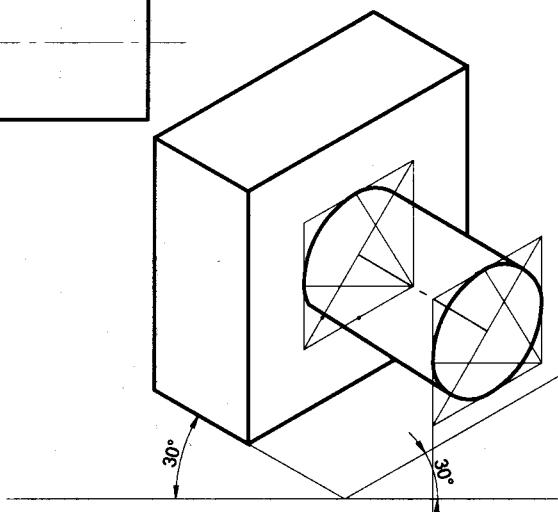
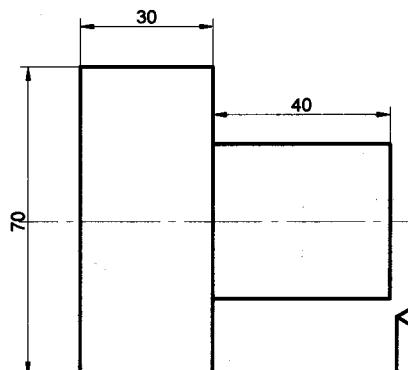
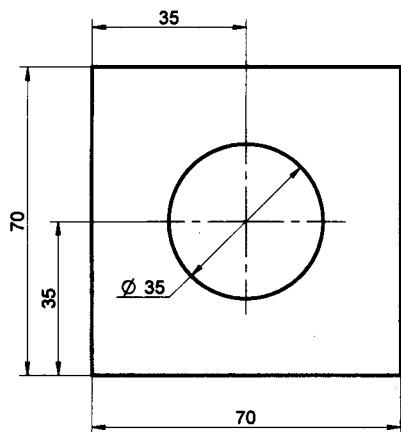
Problem 28 Following figure shows the front and side views of solid. Draw the Isometric projection of the solid.

Solution



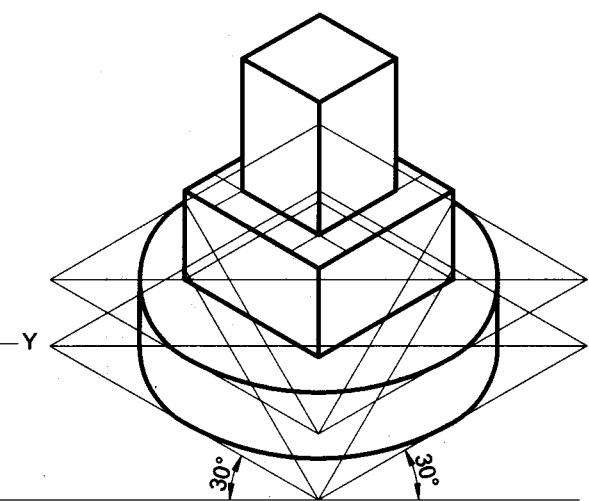
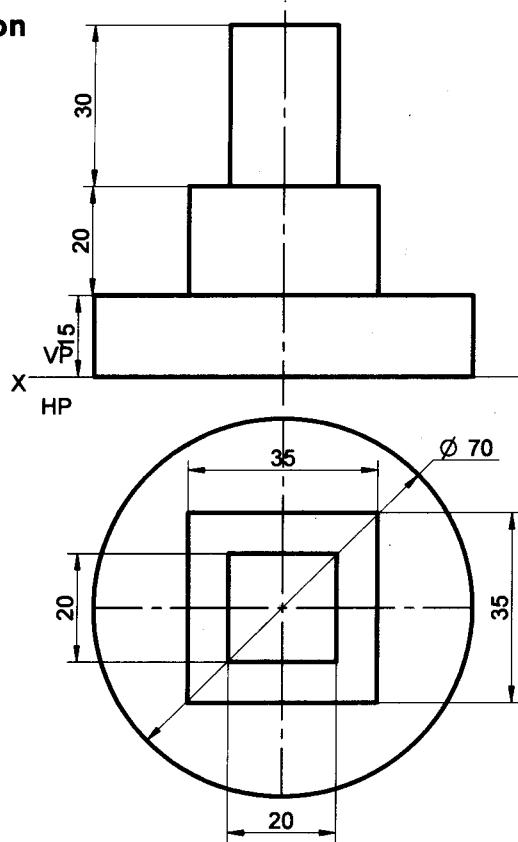
Problem 29 Following figure shows the front and side views of solid. Draw the Isometric projection of the solid.

Solution



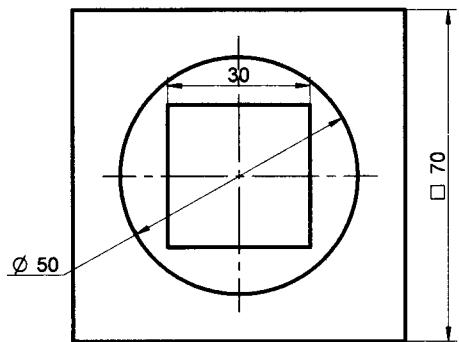
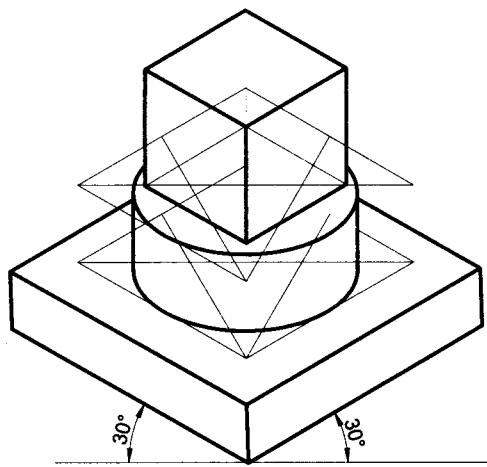
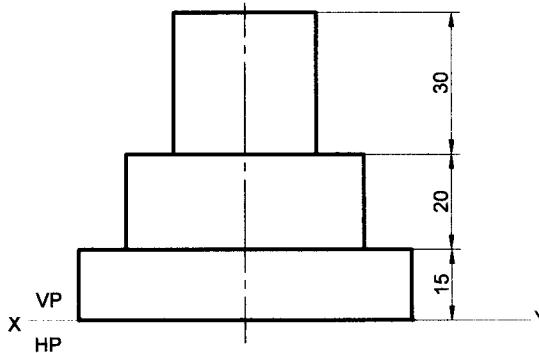
Problem 30 Following figure shows the front and top views of solid. Draw the Isometric projection of the solid.

Solution



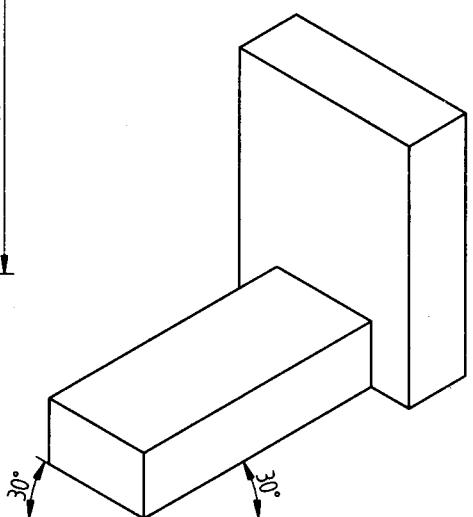
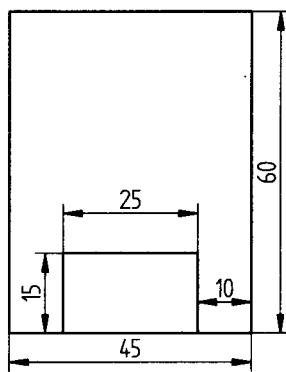
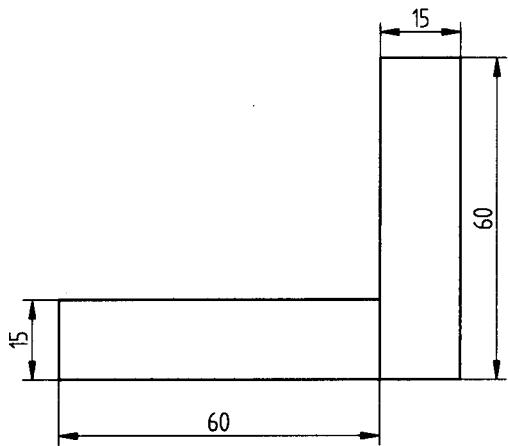
Problem 31 Following figure shows the front and top views of solid. Draw the Isometric projection of the solid.

Solution



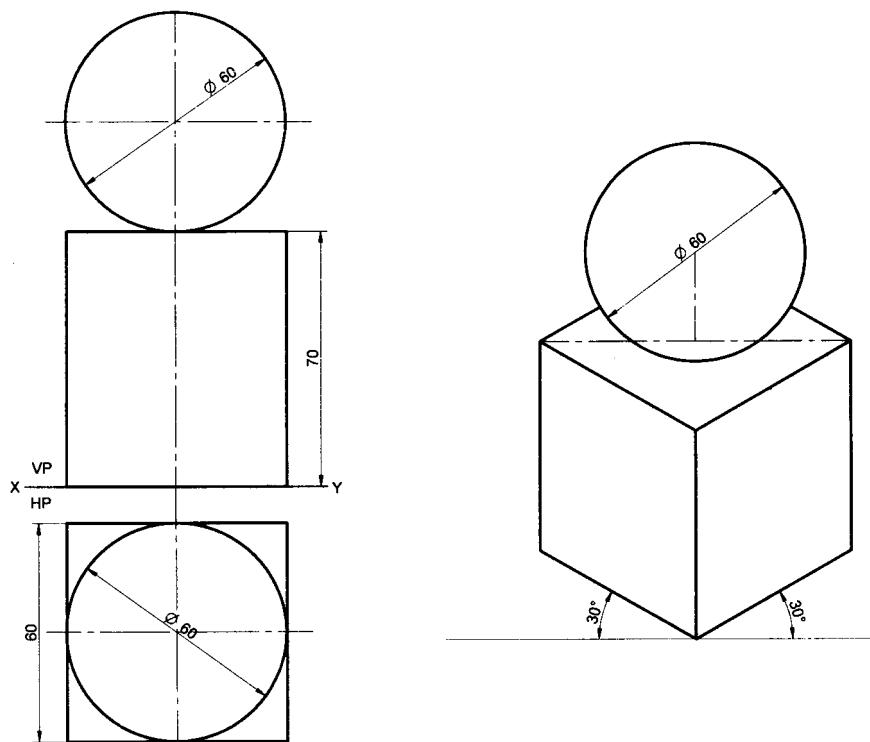
Problem 32 Following figure shows the front and side views of solid. Draw the Isometric projection of the solid.

Solution



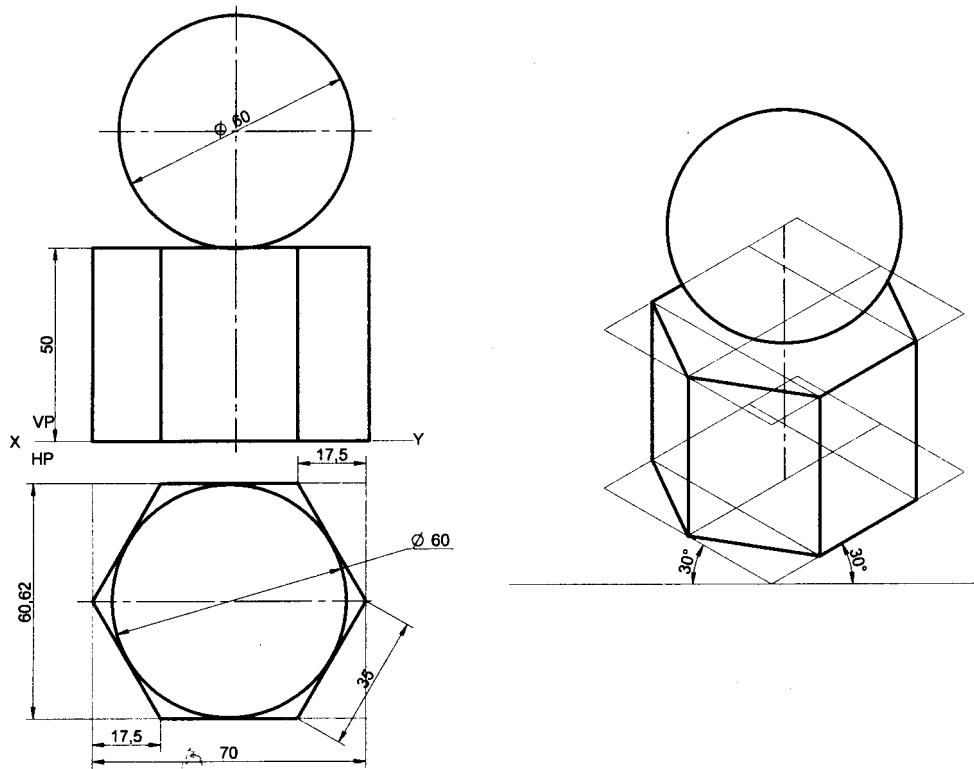
Problem 33 A sphere diameter 60mm is placed centrally on the top face of a square prism side-60mm and height 70mm. Draw the isometric projection of the combination

Solution



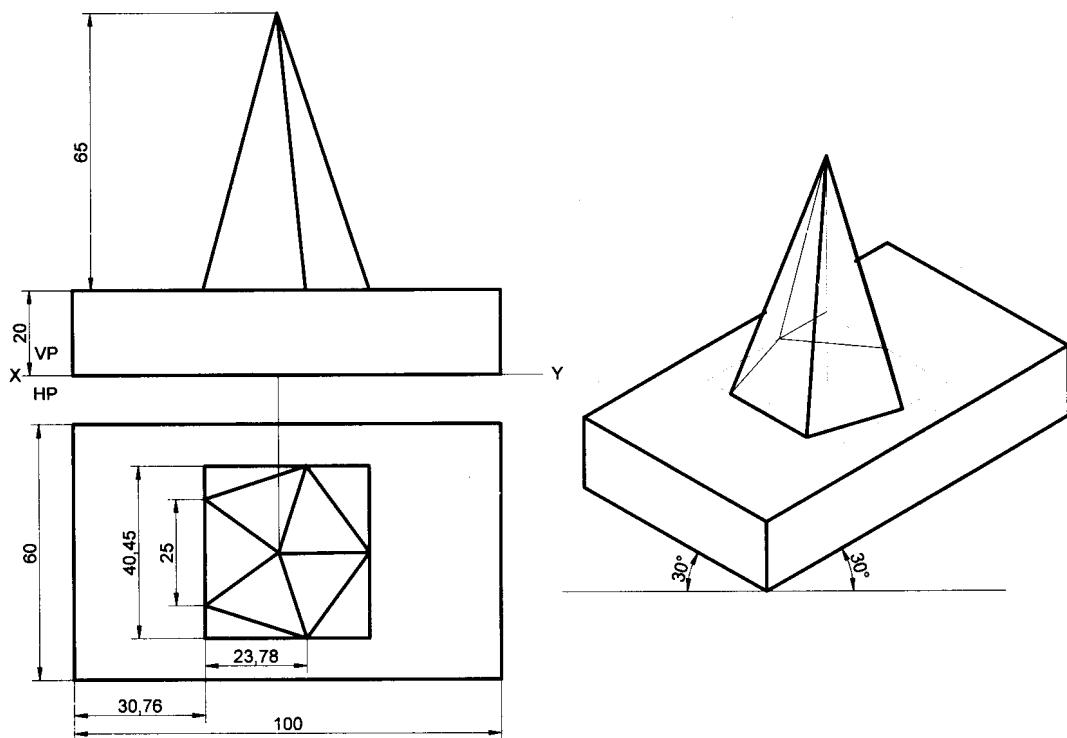
Problem 34 A sphere $\phi 60$ mm is placed centrally on the top face of a hexagonal prism side-35mm and height 50mm. Draw the isometric projection of the combination

Solution



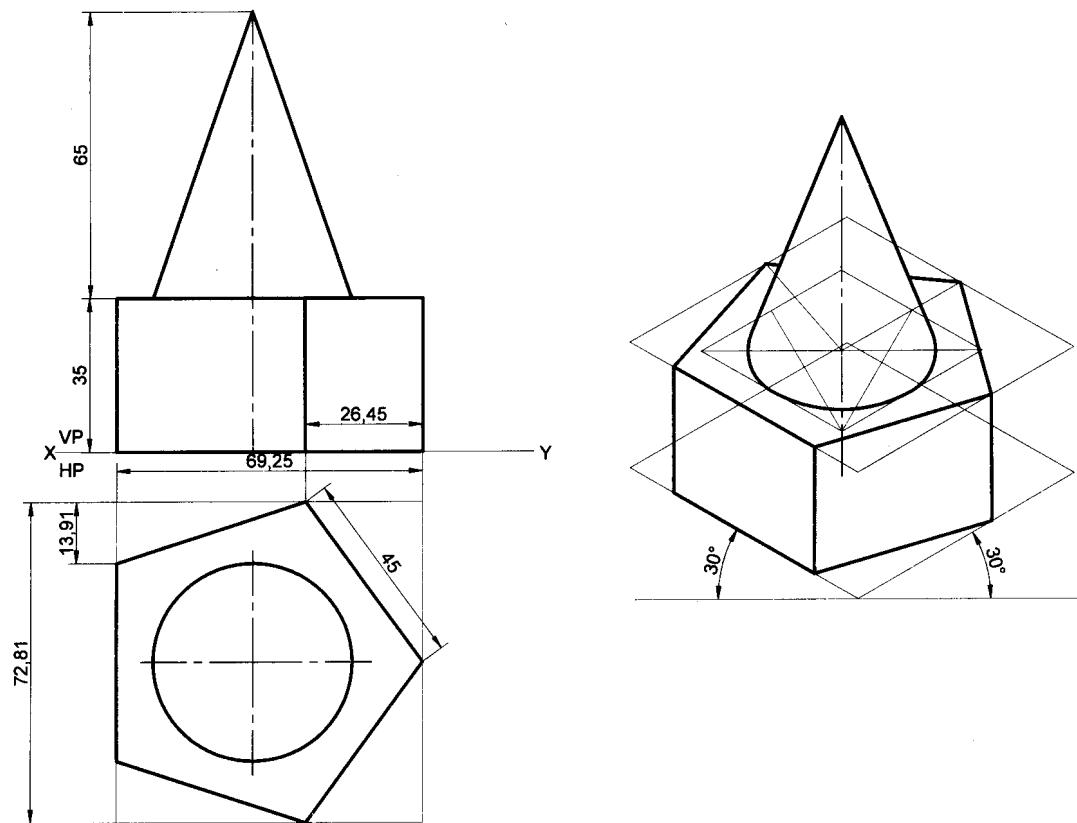
Problem 35 A pentagonal pyramid base side-25mm and height 65mm is placed centrally on a rectangular slab 100mmx60mm and 20mm-thick. Draw the isometric projection of the combination.

Solution



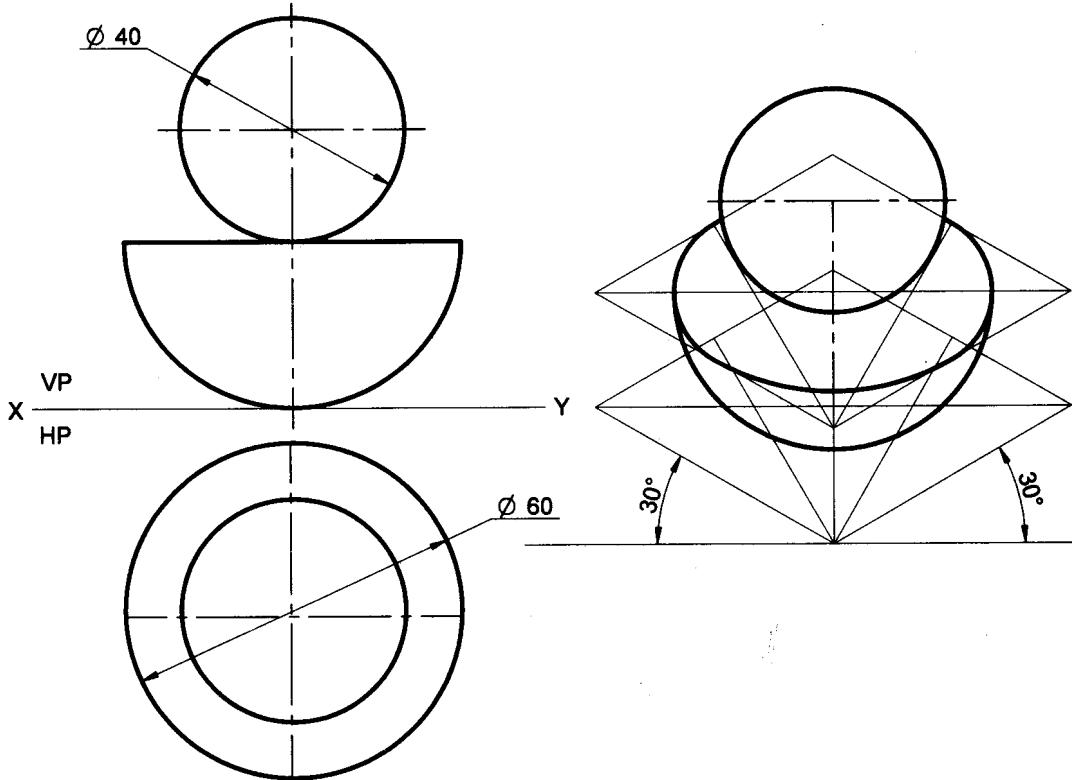
Problem 36 A cone base diameter 45mm and height 65mm is placed centrally on the top face of a pentagonal prism side-45mm and height 35mm. Draw the isometric projection of the combination.

Solution



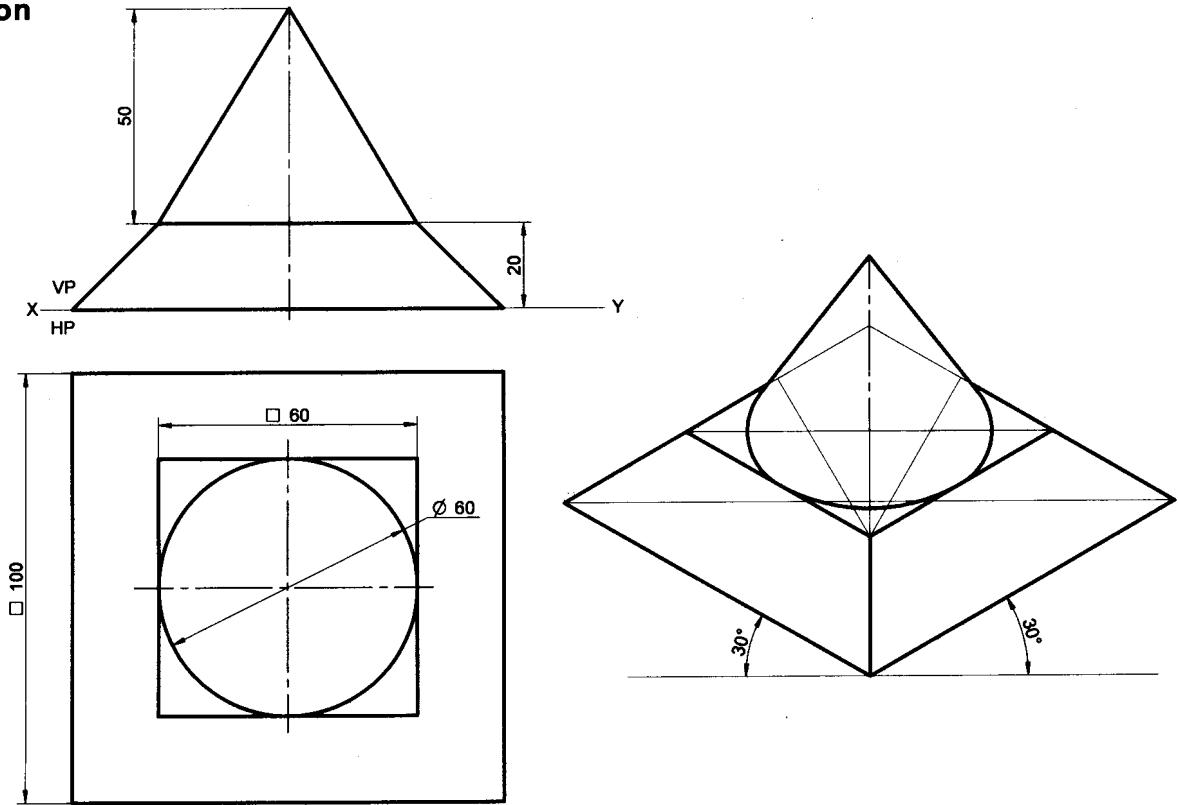
Problem 37 A sphere diameter 40mm is placed centrally on the flat face of a hemisphere diameter 60mm. Draw the isometric projection of the combination

Solution



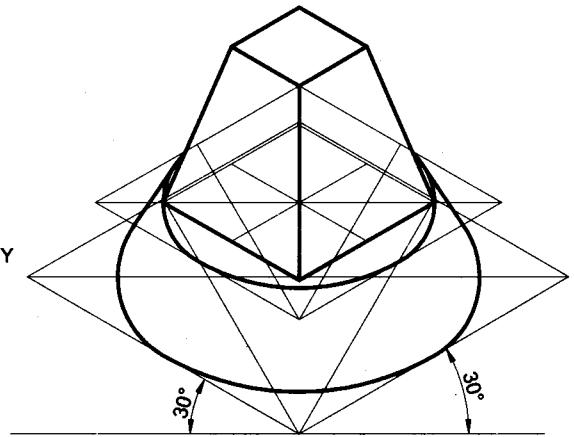
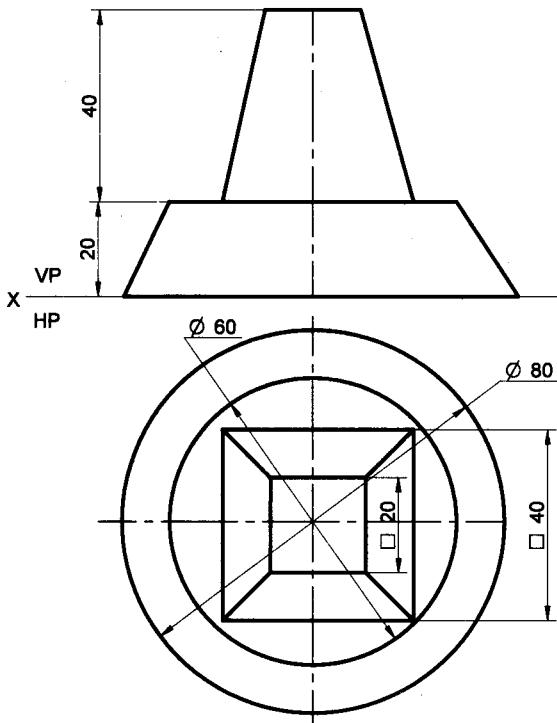
Problem 38 A cone of base diameter 60mm, top diameter 40mm and height 50mm is placed centrally on frustum of a square pyramid base side-100mm top face side-60mm and height 20mm. Draw the isometric projection of the combination

Solution



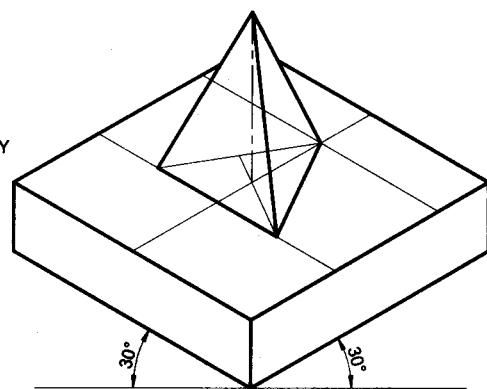
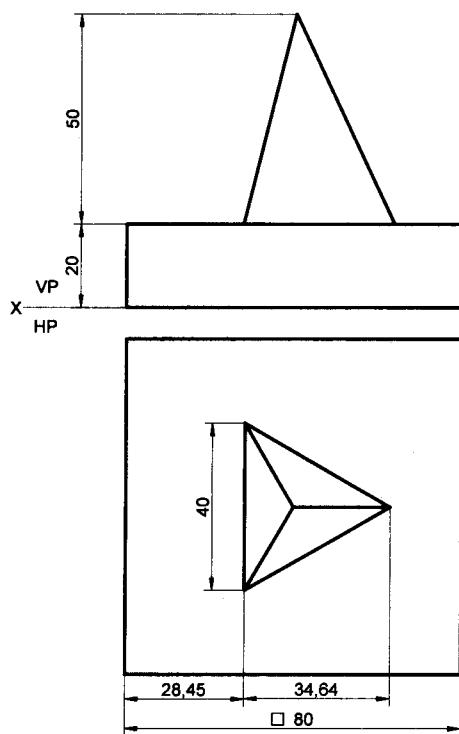
Problem 39 A frustum of a square pyramid base side-40mm, top face side-20mm and height 40mm is placed centrally on frustum of a cone base diameter 80mm, top diameter 60mm and height 20mm. Draw the isometric projection of the combination

Solution



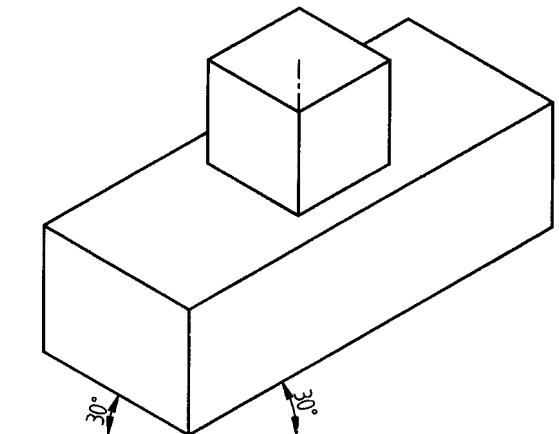
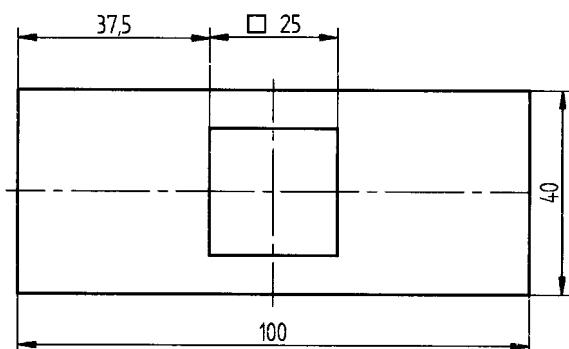
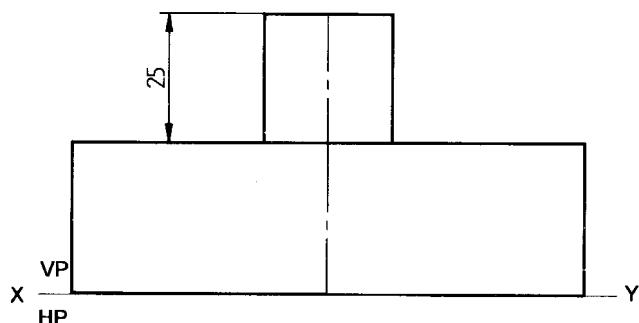
Problem 40 A triangular pyramid base side-40mm and height 50mm is placed centrally on a square slab side-80mm and 20mm-thick. Draw the isometric projection of the combination

Solution



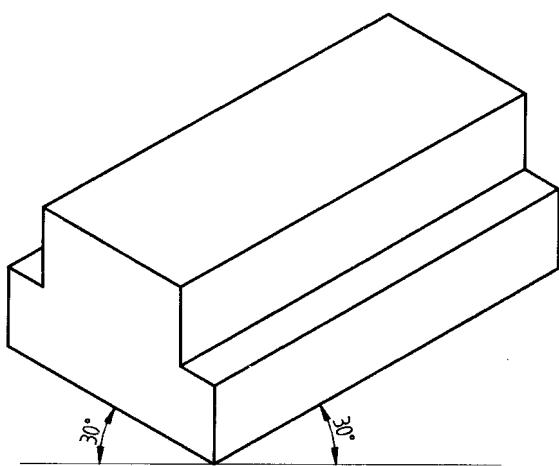
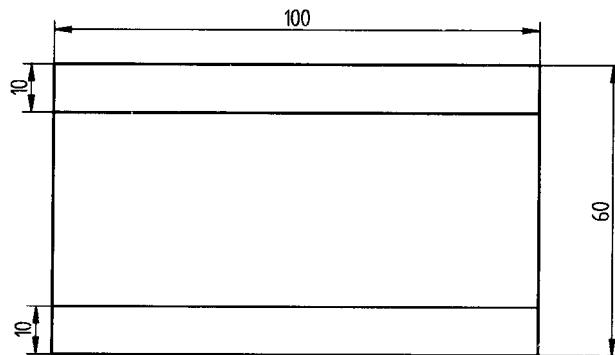
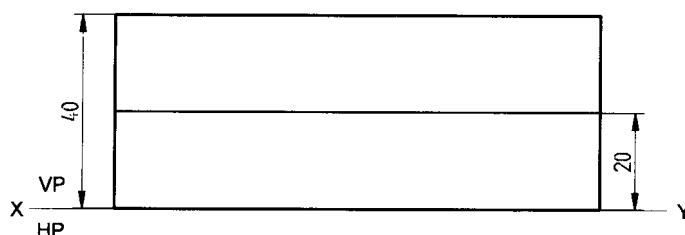
Problem 41 A cube of side-25mm is resting centrally on a rectangular slab 100mmx40mm and 30mm thick. Draw the isometric projection of the combination

Solution



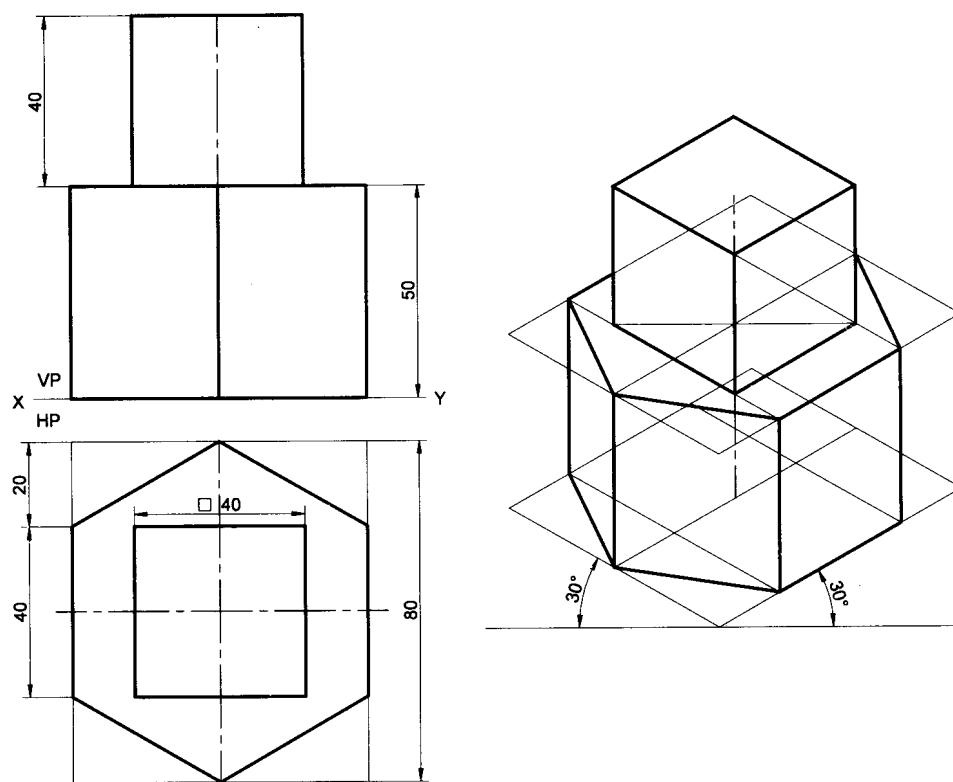
Problem 42 Two rectangular plates are placed centrally with dimensions (lxbxh)100mmx60mmx20mm and 100mmx40mmx20mm such that longer edges are parallel. Draw the isometric projection of the combination

Solution



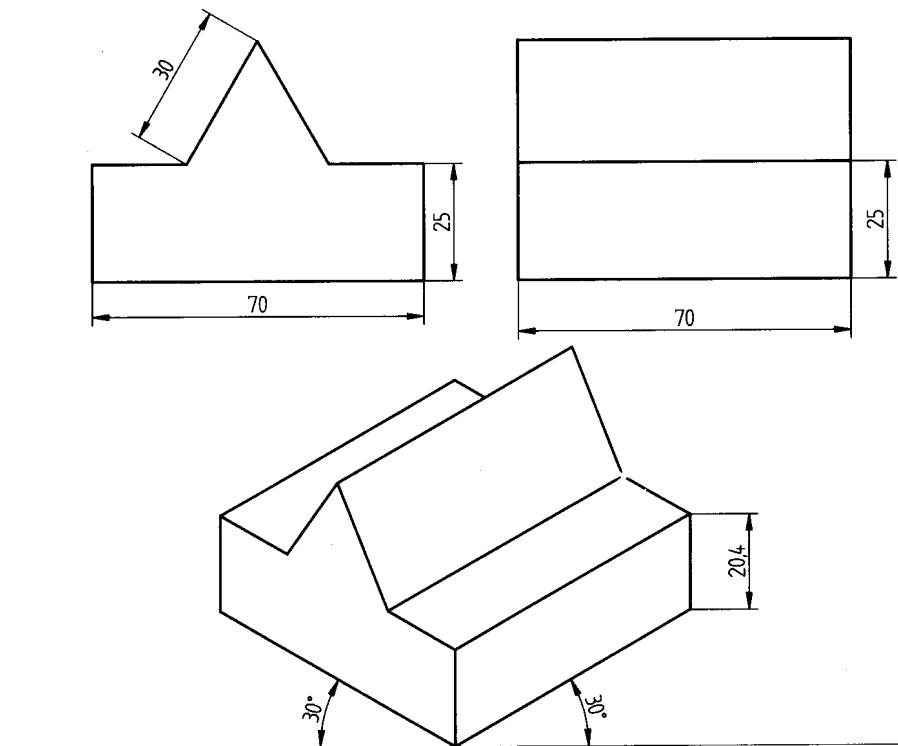
Problem 43 A cube of side-40mm is resting centrally on a hexagonal prism base side-40mm and height 50mm, such that one of the base sides of the cube is parallel to one of the sides of the top face of the prism. Draw the isometric projection of the combination.

Solution



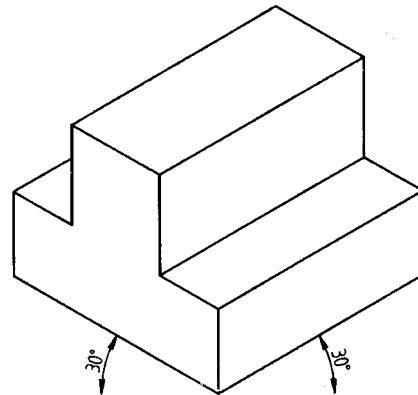
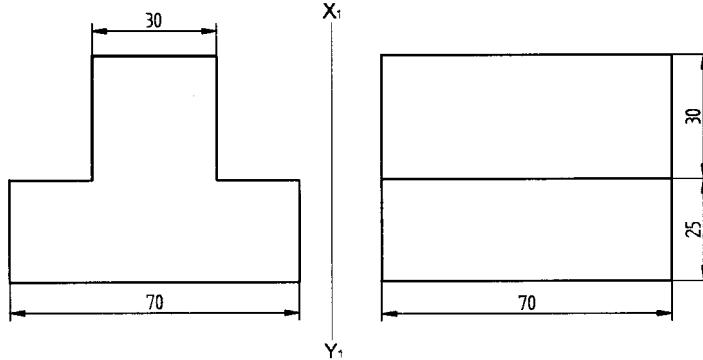
Problem 44 A triangular prism base side-30mm and length-70mm is resting on its rectangular face on top of a square slab side-70mm and 25mm-thick. Draw the isometric projection of the combination

Solution



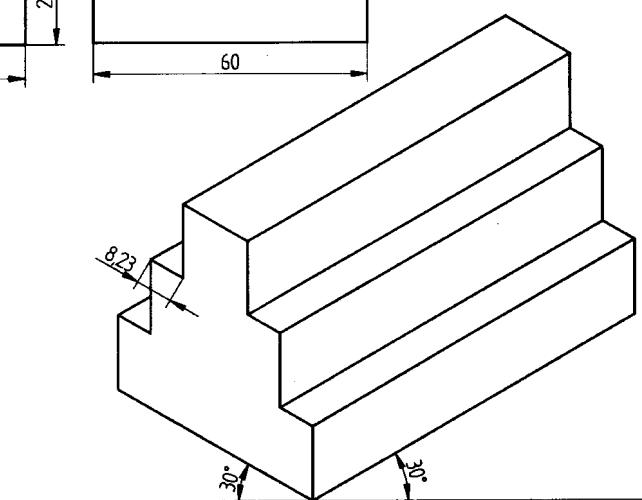
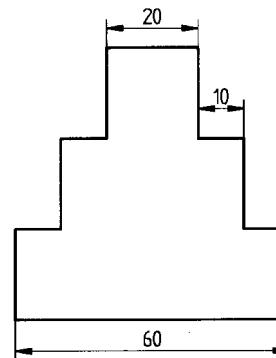
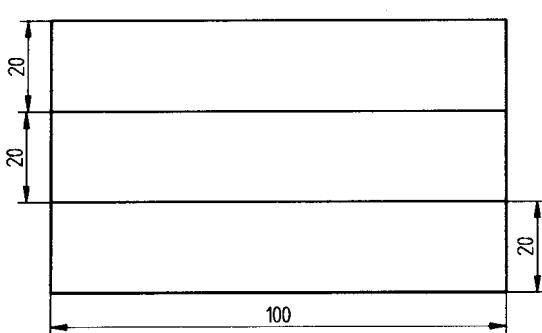
Problem 45 A square prism of base side-30mm and length-70mm, is resting on its rectangular face on top of a square slab side -70mm and 25mm-thick. Draw the isometric projection of the combination

Solution



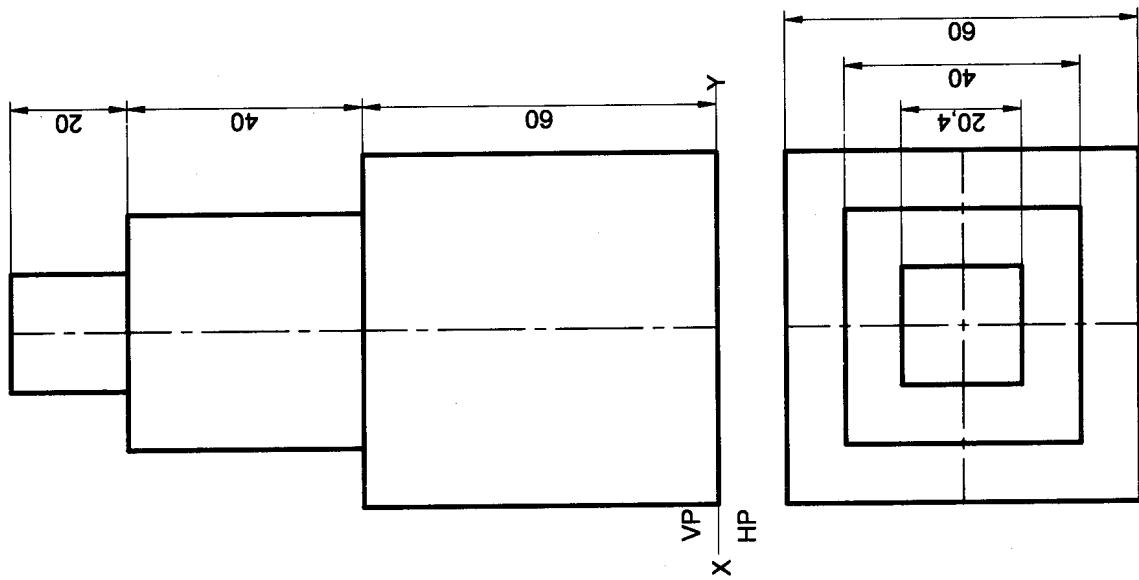
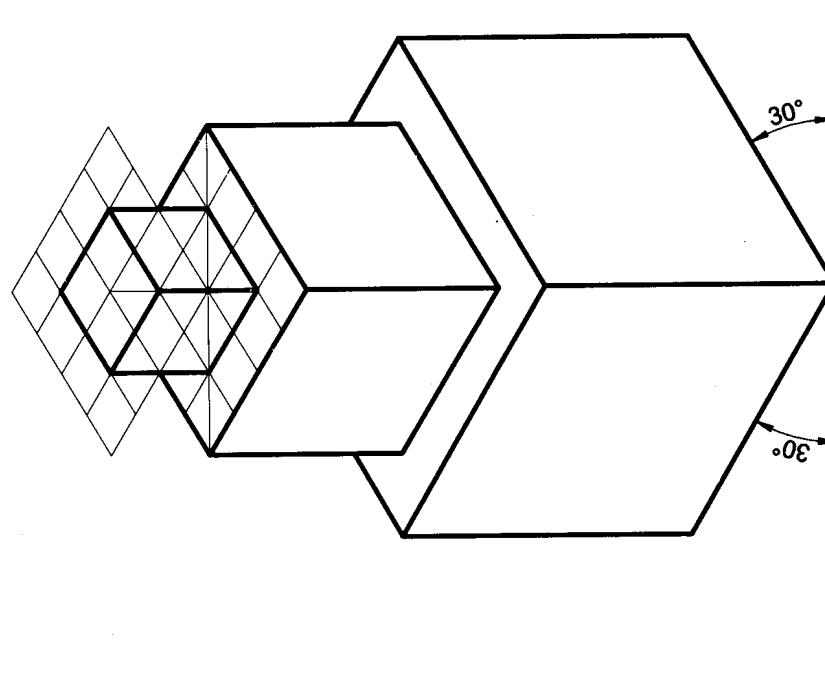
Problem 46 Three rectangular slabs (lxbxh) 100mmx60mmx20mm 100mmx40mmx20mm and 100mmx20mmx20mm are placed one above the other in the ascending order of their width-b, such that their longer axes are co-planar. Draw the isometric projection of the combination

Solution



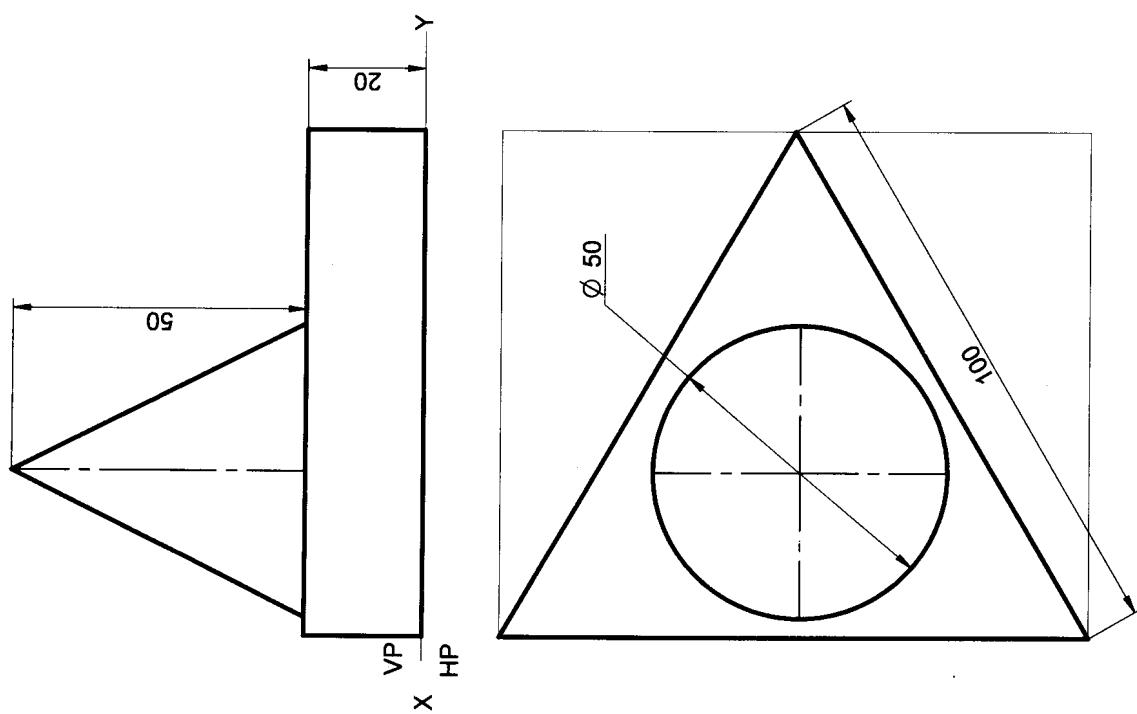
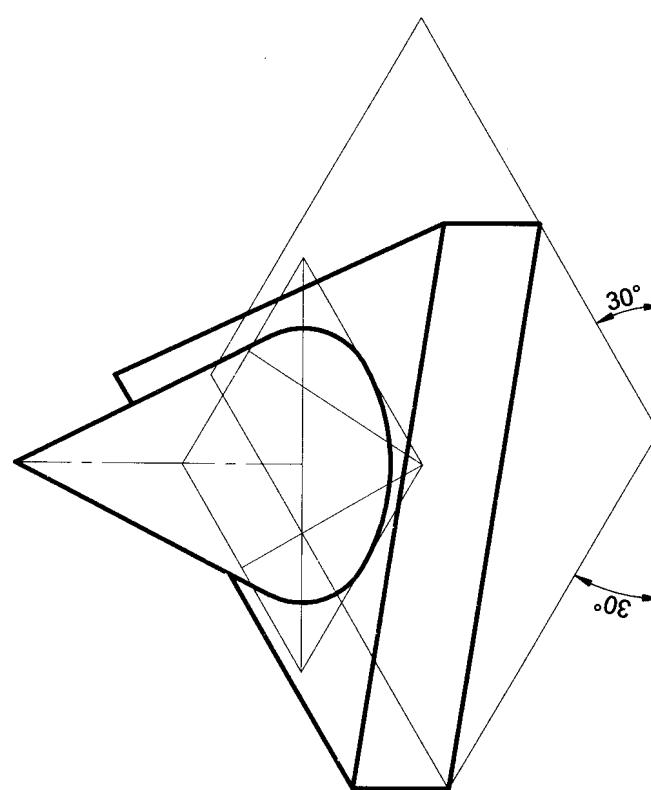
Problem 47 Three cubes of sides 60mm, 40mm and 20mm are placed centrally one above the other in the ascending order of their side. Draw the isometric projection of the combination.

Solution



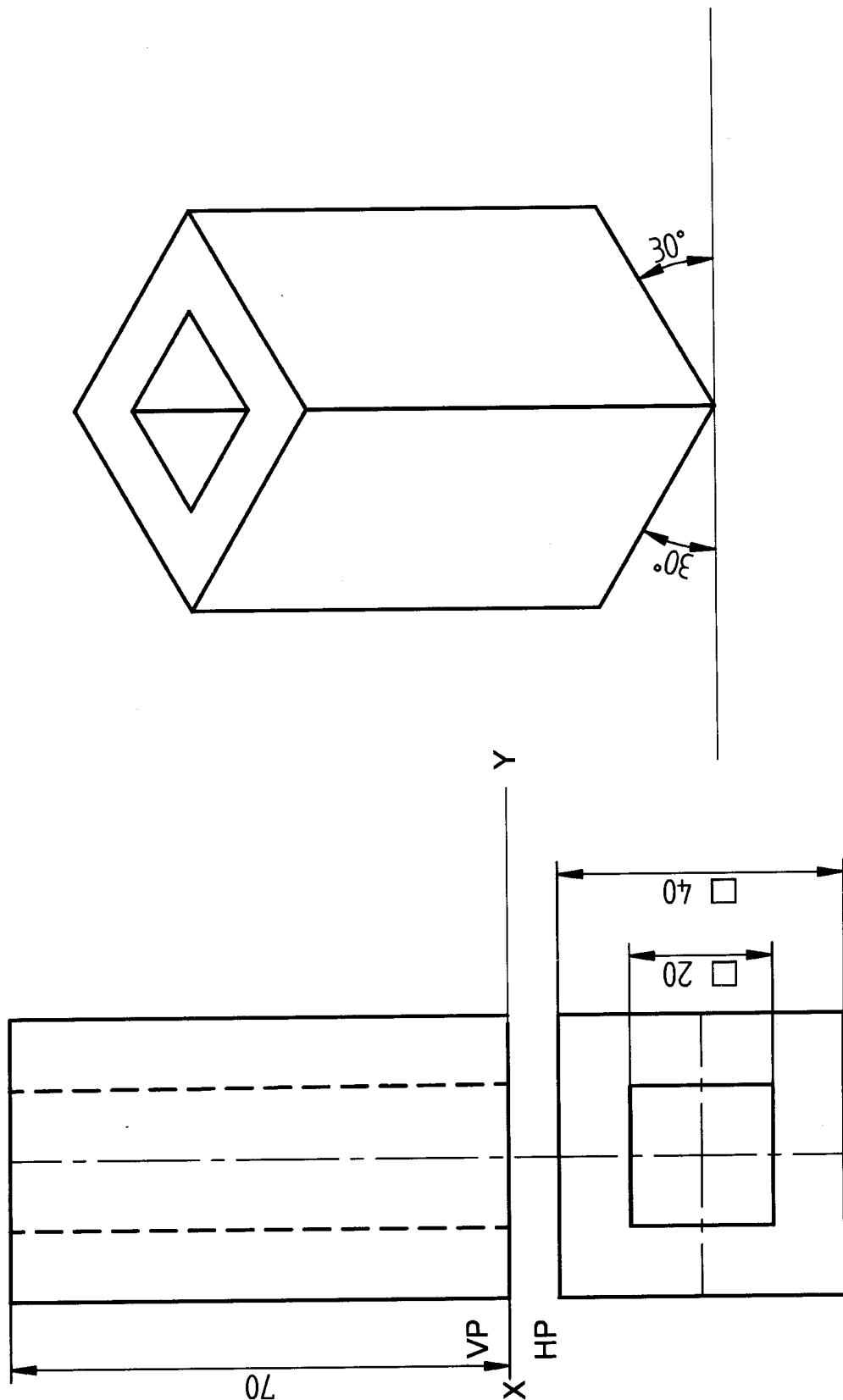
Problem 48 A cone of base diameter 50mm and height 60mm is placed centrally on an equilateral triangular prism of side-100mm and 20mm thick Draw the isometric projection of the combination

Solution



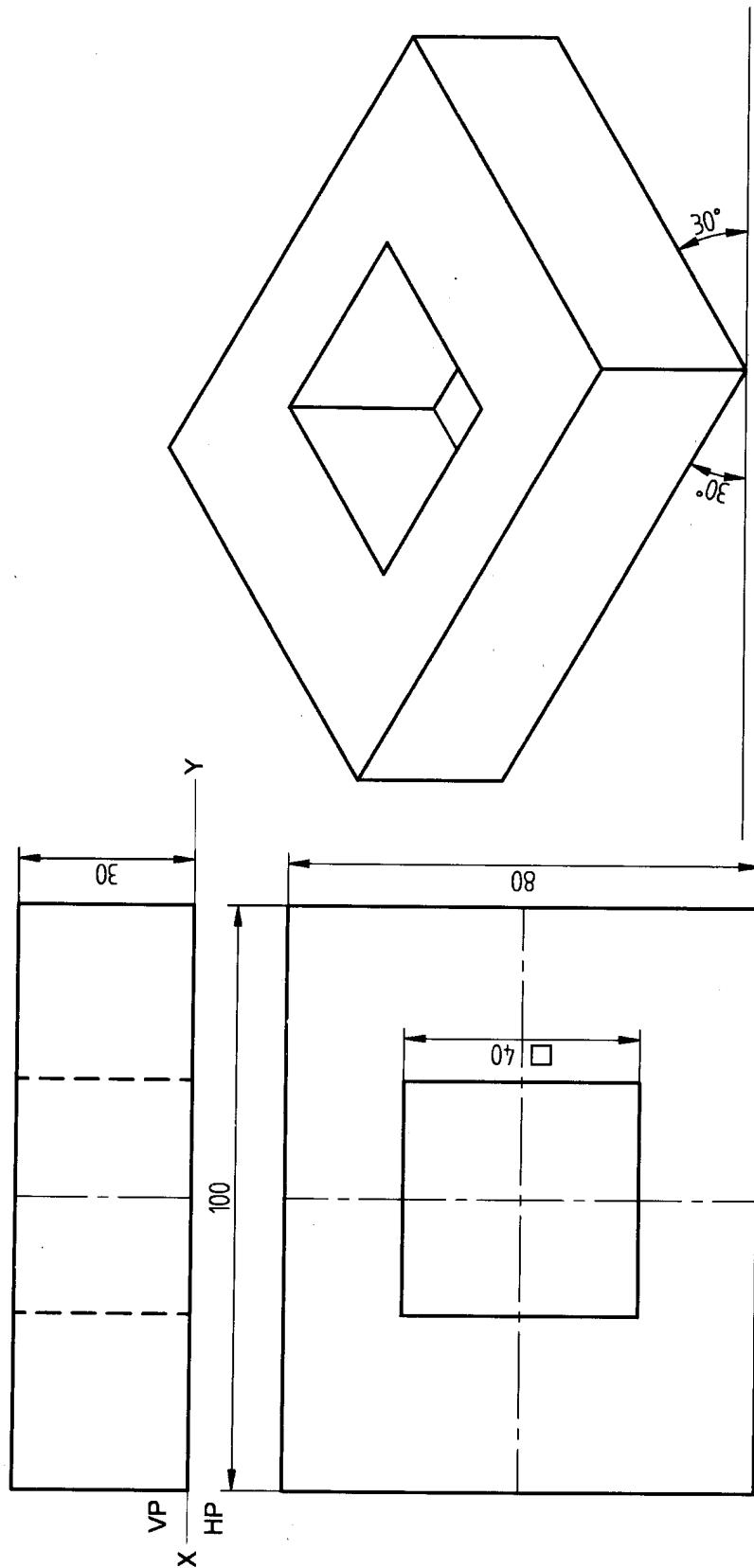
Problem 49 A square prism side-40mm and height 70mm has a full depth co-axial square hole side-20mm, such that edges of both the squares are parallel. Draw the isometric projection of the combination

Solution



Problem 50 A rectangular slab base-100mmx80mm and height 30mm has a full depth co-axial square hole side-40mm, such that one of the sides of the square is parallel to one of the sides of the rectangle. Draw the isometric projection of the combination

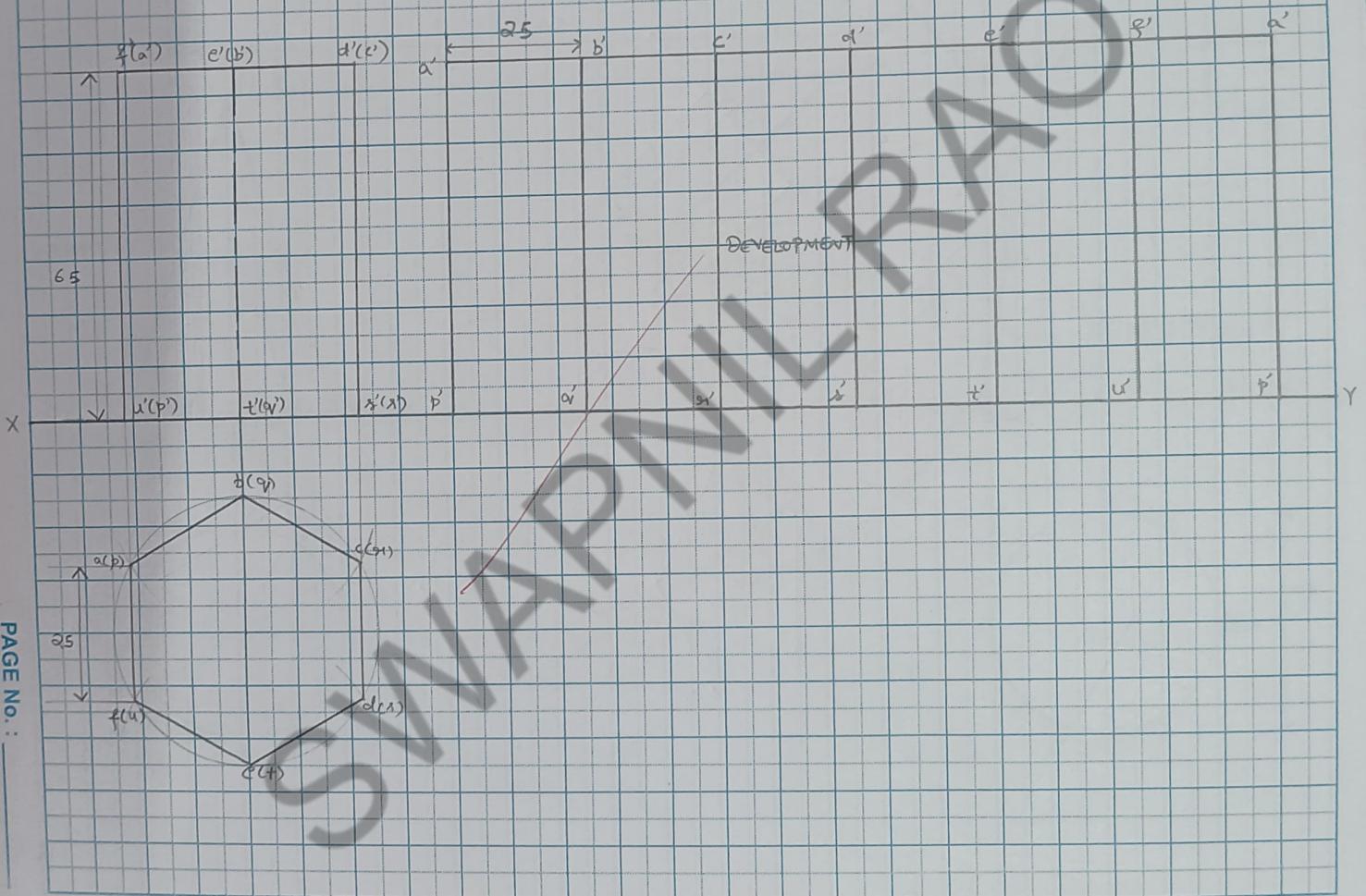
Solution



DEVELOPMENT:

REFERENCE PLAYLIST:

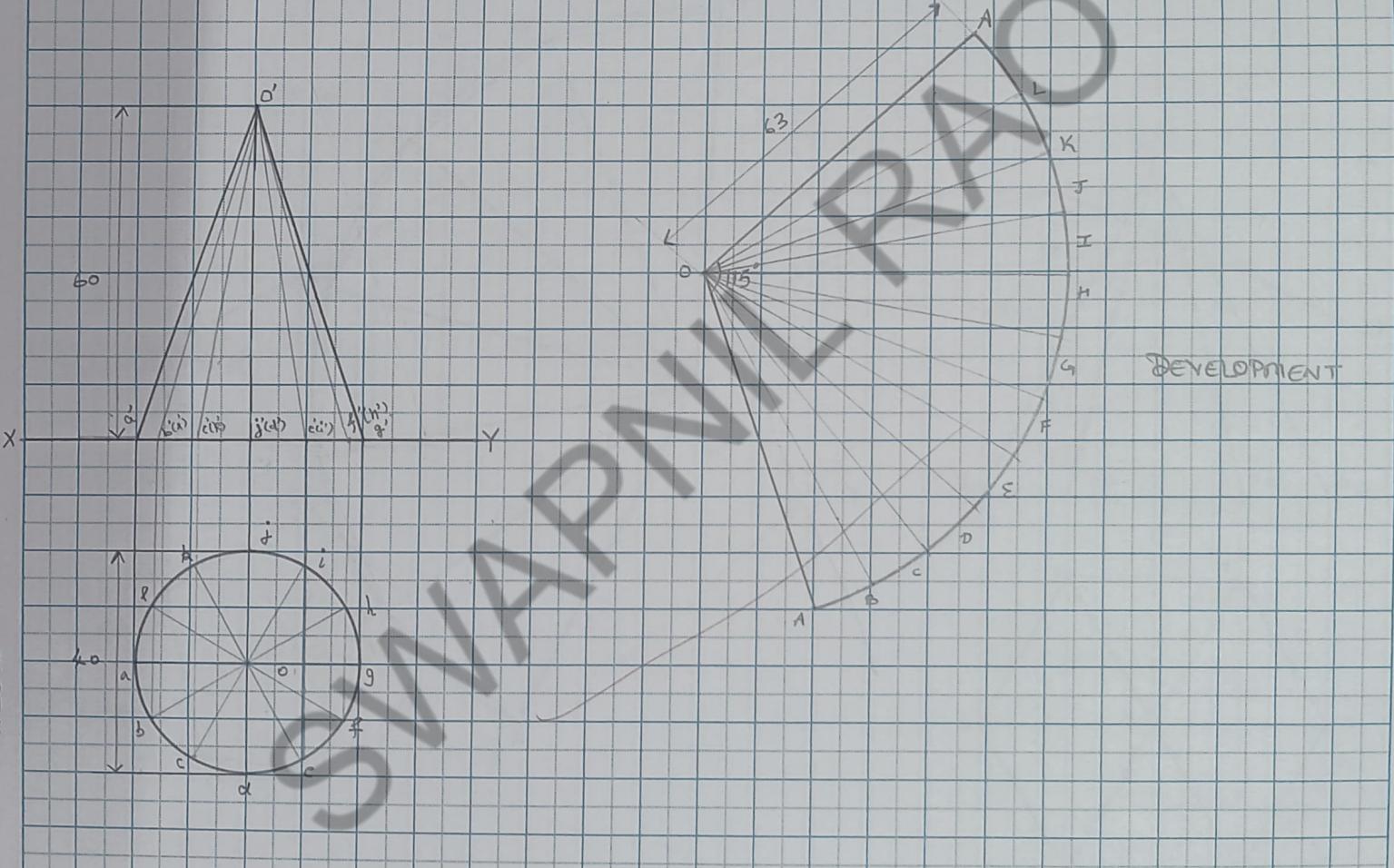
**[https://www.youtube.com/watch?
v=AzFz8A5HgiQ&list=PLDN15nk5uLiBrAkd
OhEvkmVPs2UtwfGao](https://www.youtube.com/watch?v=AzFz8A5HgiQ&list=PLDN15nk5uLiBrAkdOhEvkmVPs2UtwfGao)**

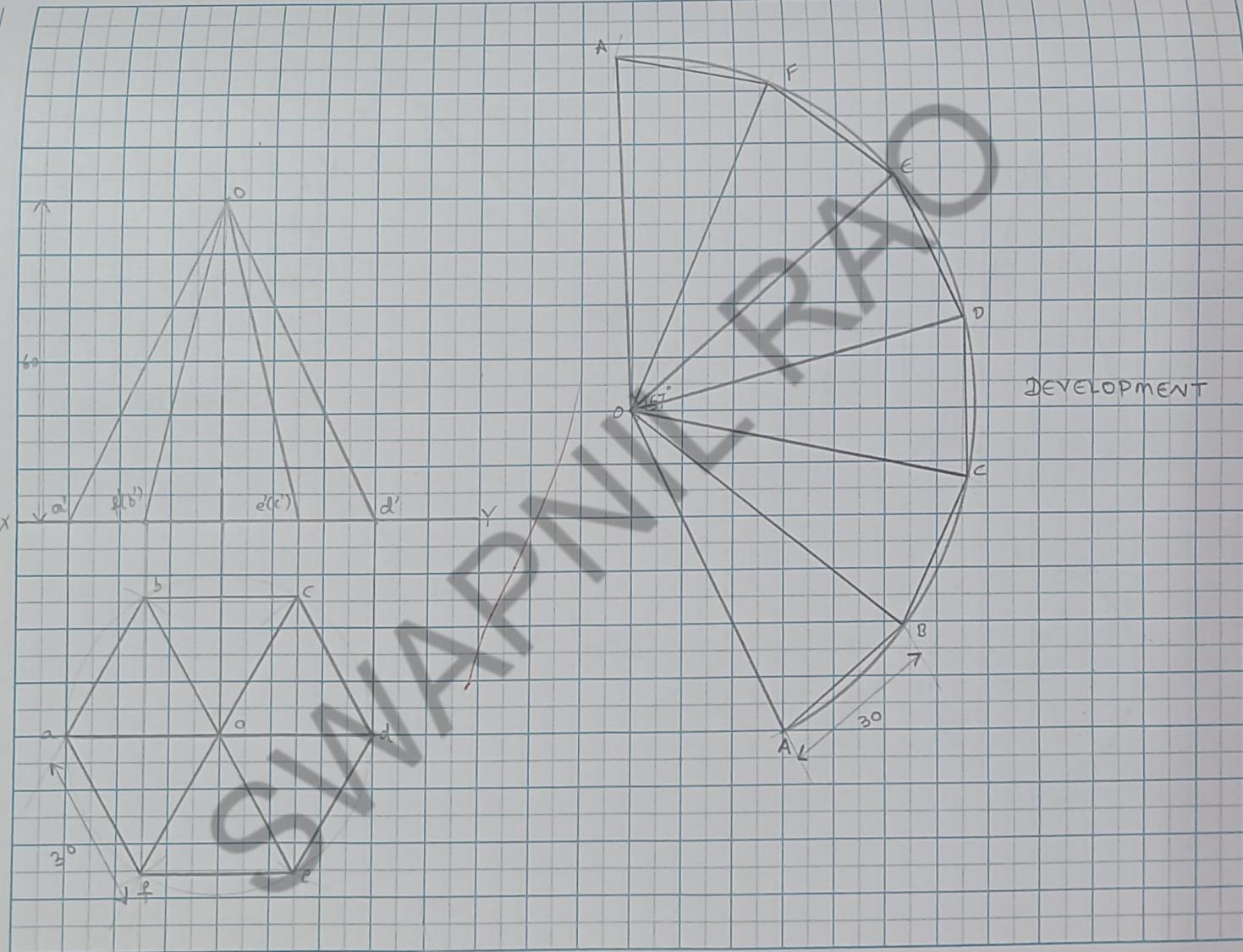


TITLE : _____

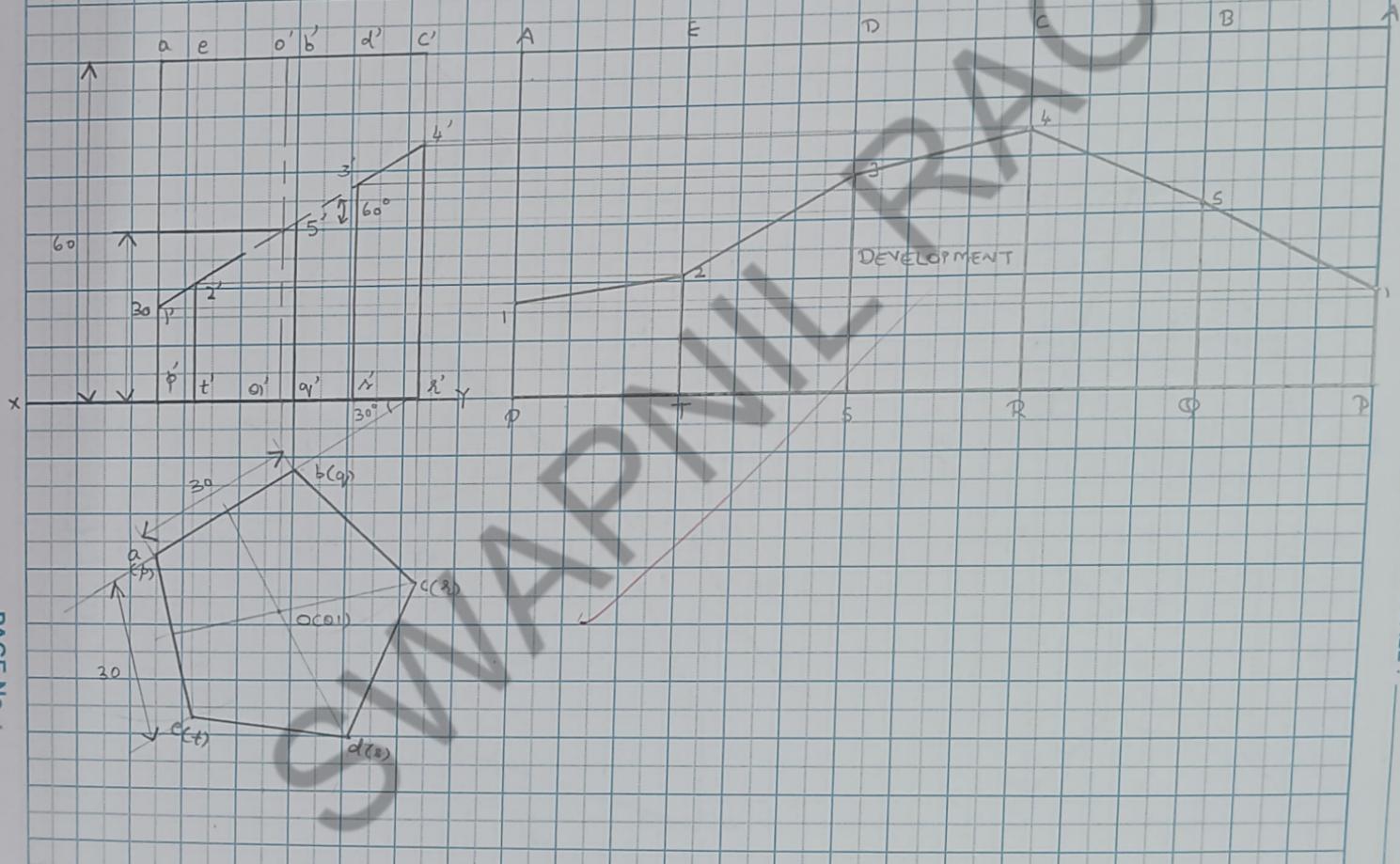
SCALE : _____

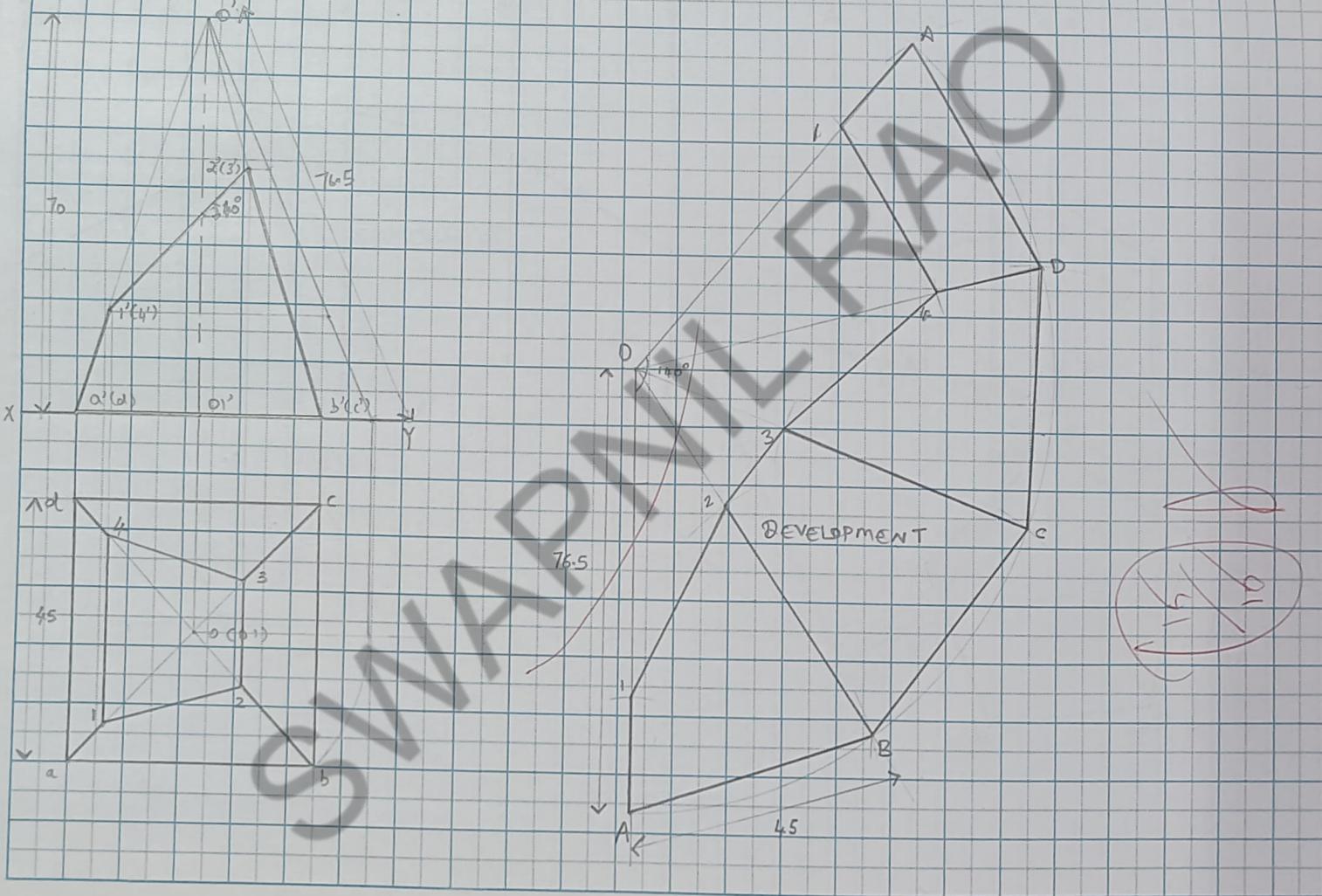






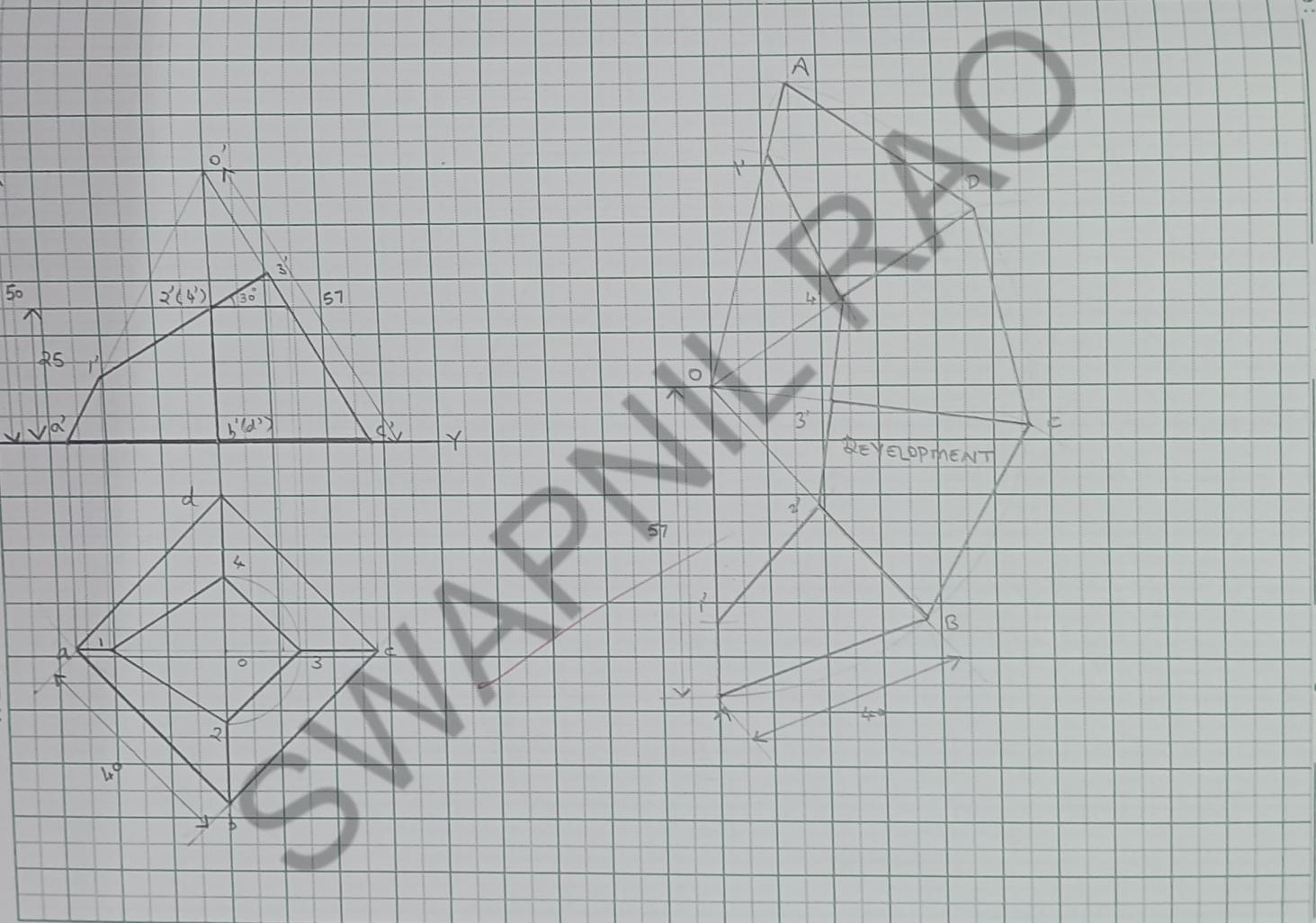
SCALE : _____





X

PAGE No. :

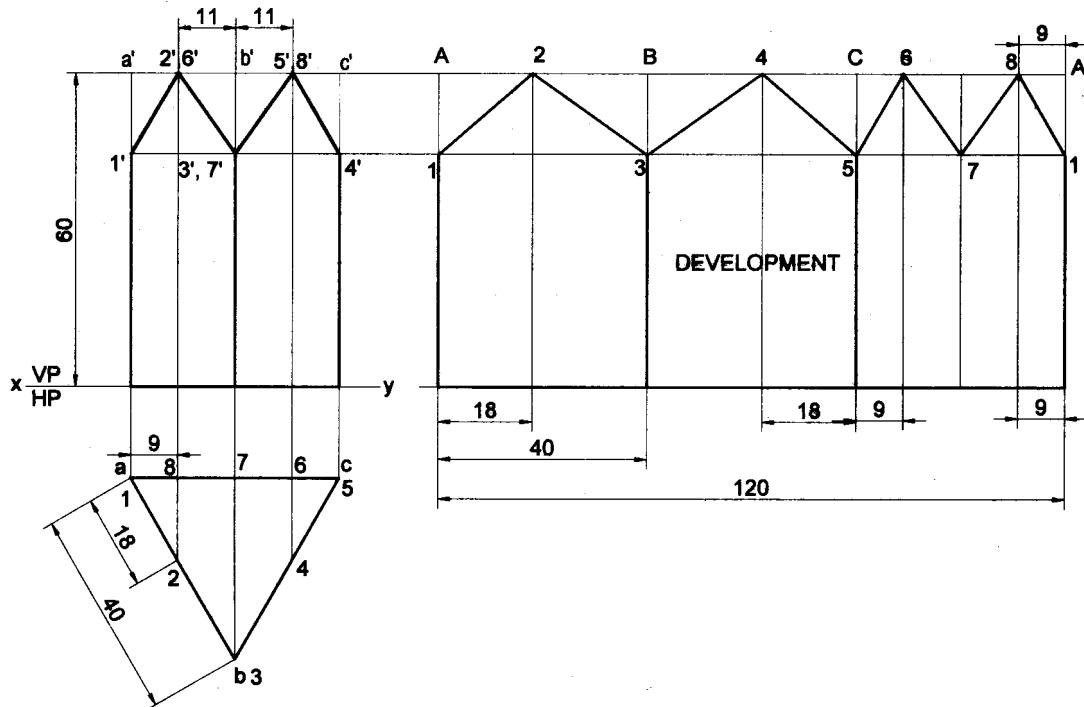


CHAPTER 5

DEVELOPMENT OF LATERAL SURFACES OF SOLIDS

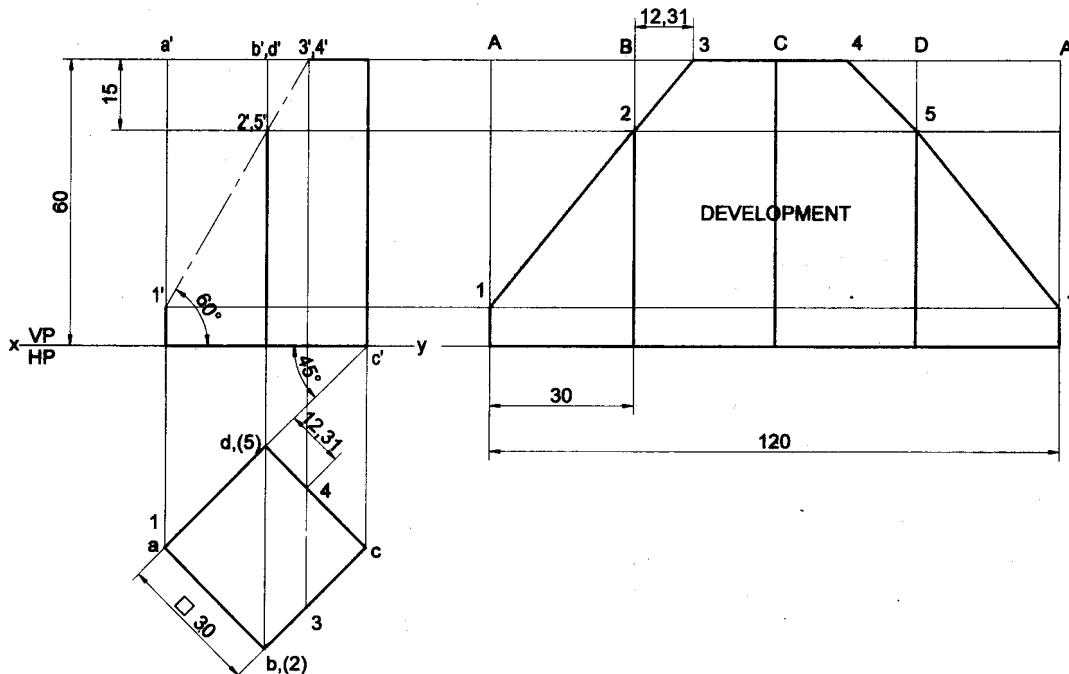
Problem 1 A triangular prism with one of its rectangular faces parallel to VP and nearer to it is cut as shown in Fig. Draw the development of the retained portions of the prism which are shown in dark lines.

Solution



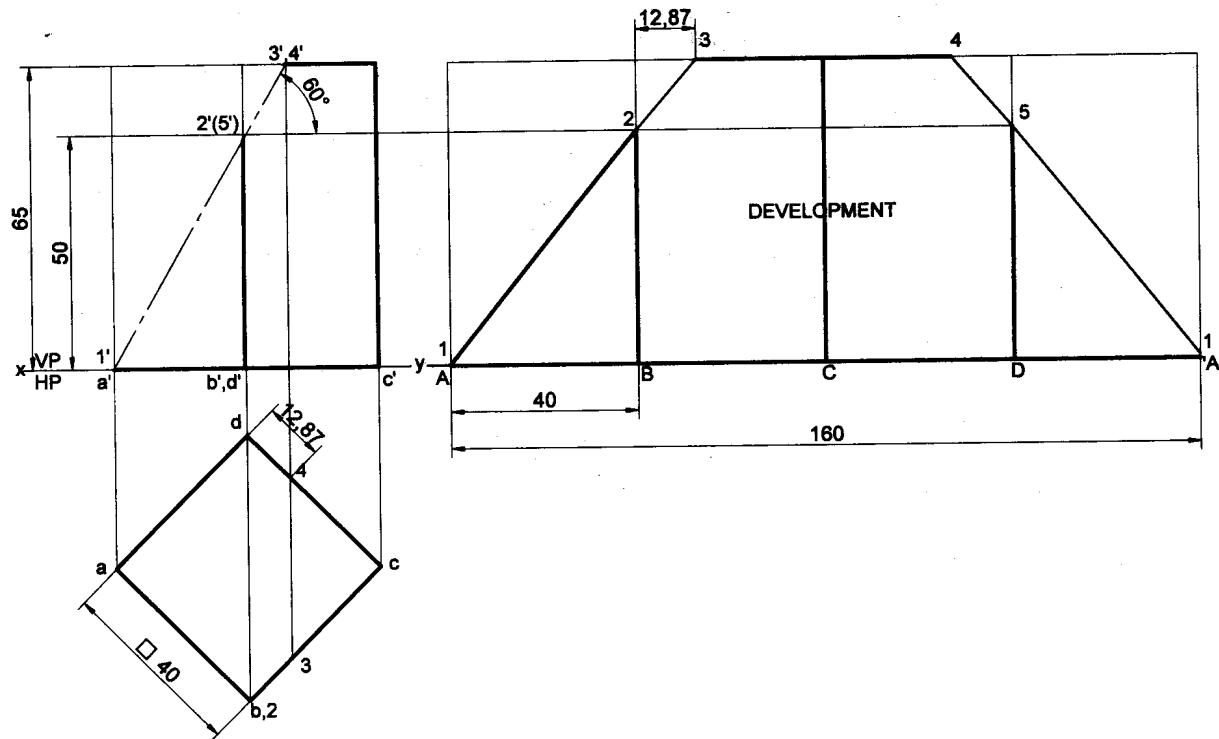
Problem 2 A square prism of base side 30 mm and axis length 60 mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60° to HP and perpendicular to VP and is passing through a point on the axis at a distance 50 mm from the base. Draw the development of the lower portion of the prism.

Solution



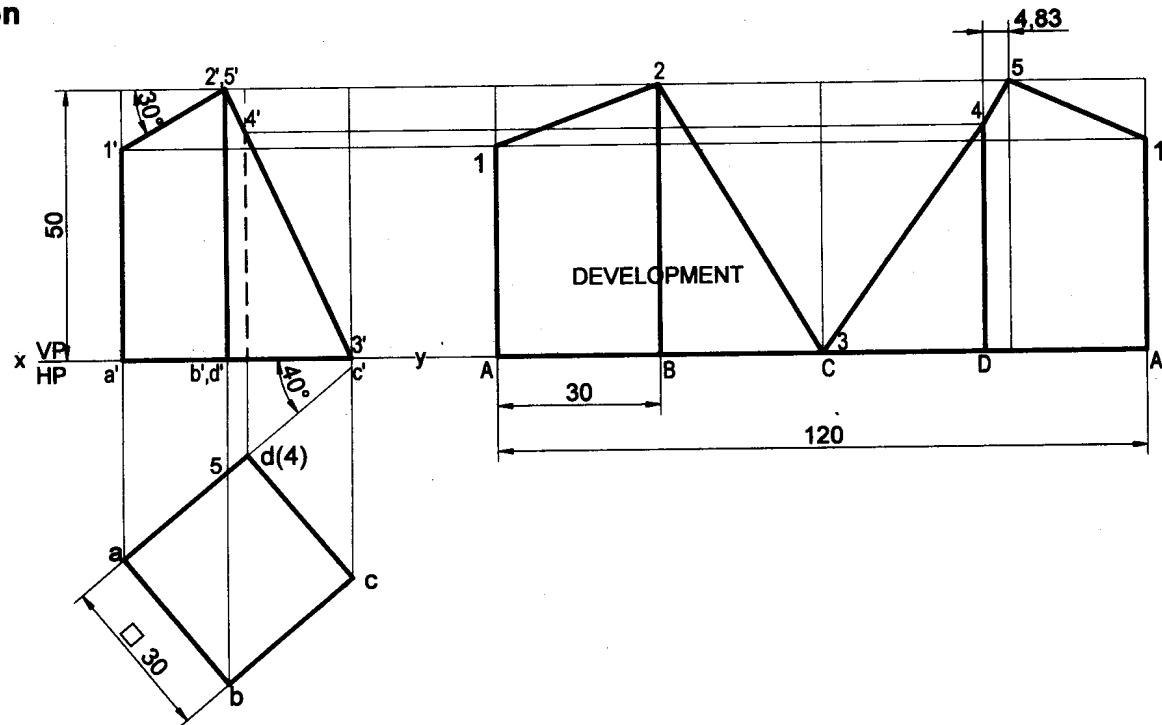
Problem 3 A square prism of base side 40mm and axis length 65mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60° to HP and perpendicular to VP and is passing through a point on the axis at a distance 15mm from the top face. Draw the development of the lower portion of the prism.

Solution



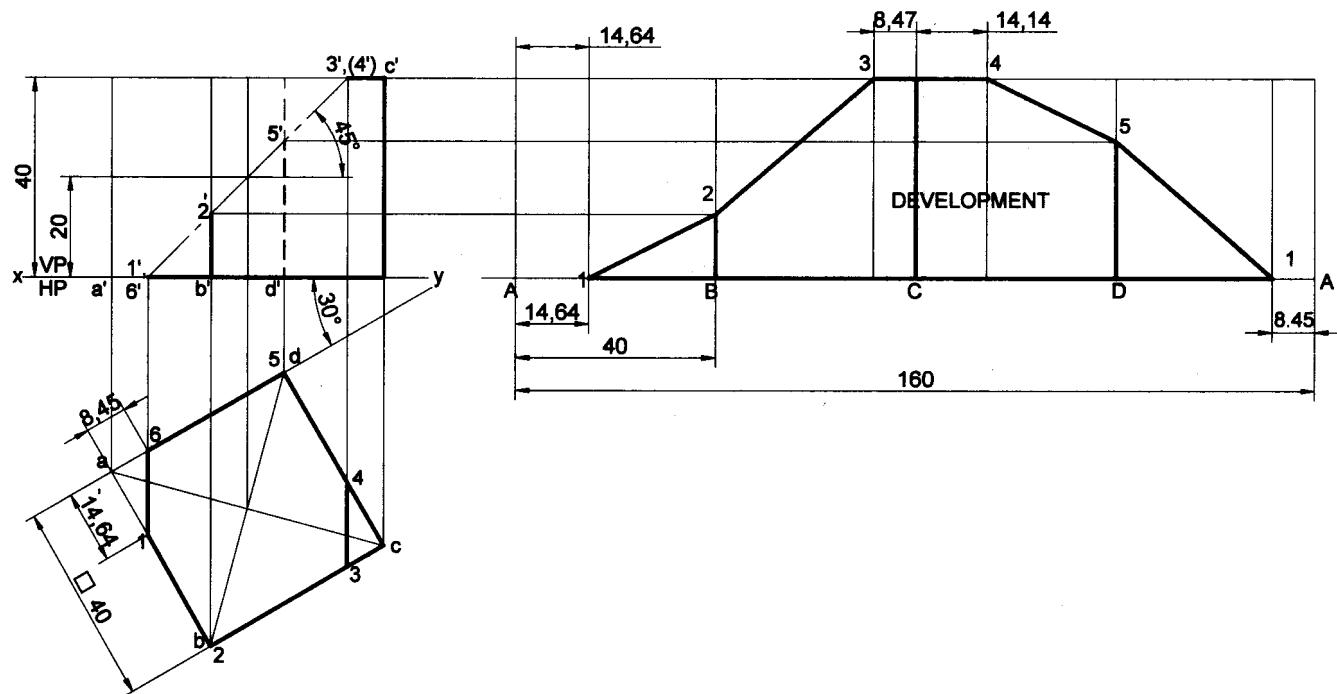
Problem 4 A square prism of 30mm side of the base and height 50mm is resting with its base on HP such that one of its vertical faces is inclined at 40° to VP. It is cut as shown in the following front view figure. Draw the development of the lateral surface of the prism.

Solution



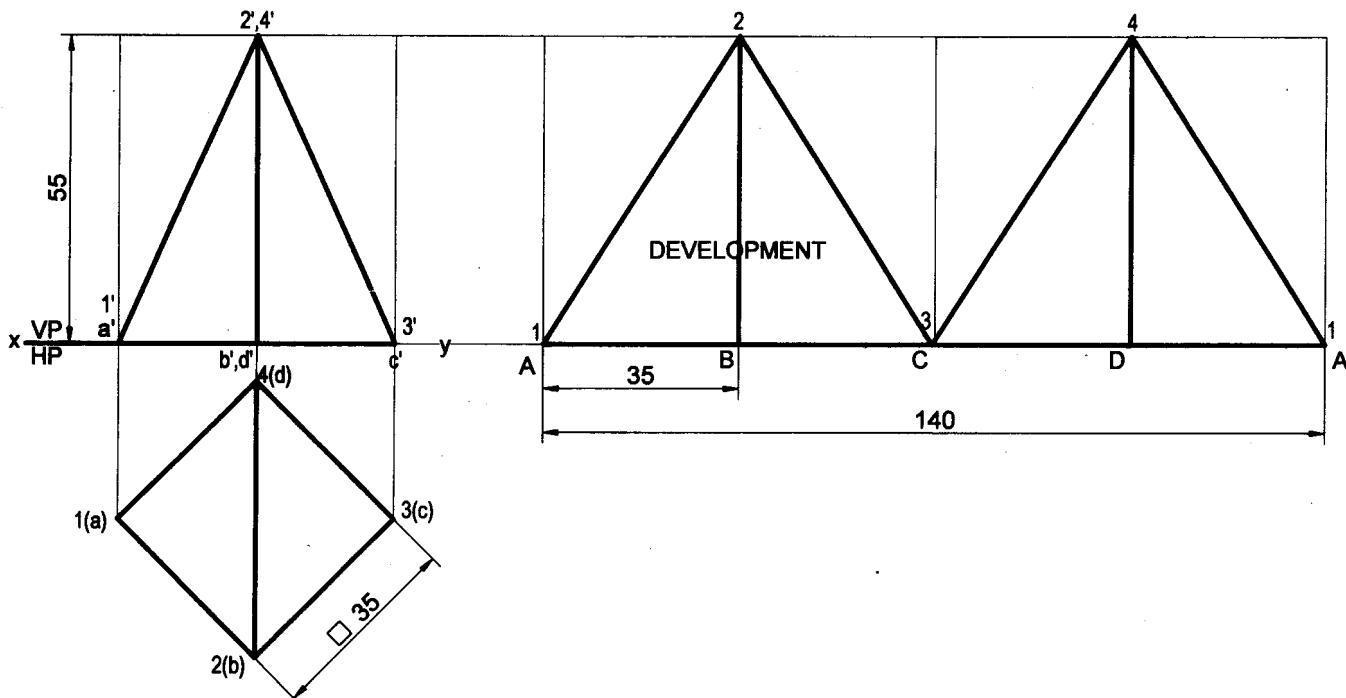
Problem 5 A cube of side 40mm is resting on HP with its base on HP such that one of its vertical faces is inclined at 30° to the VP. It is cut by a section plane perpendicular to VP, inclined to HP at an angle 45° and passes through the midpoint of the axis. Draw the development of the lower lateral surface of the cube.

Solution



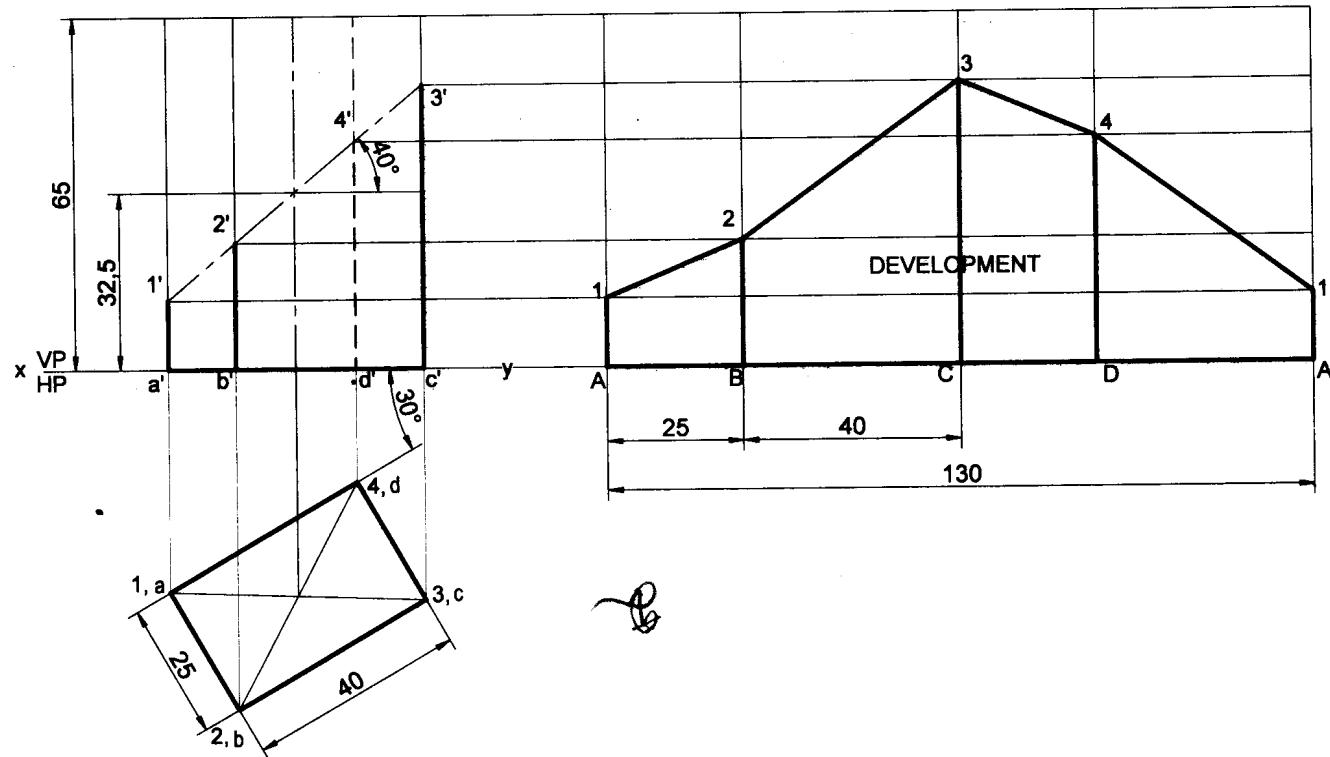
Problem 6 A square prism of base side 35mm rests with its base on HP and two faces equally inclined to VP. Draw the development of the lateral surfaces of the retained portions of the cut prism shown by dark lines in the Fig.

Solution



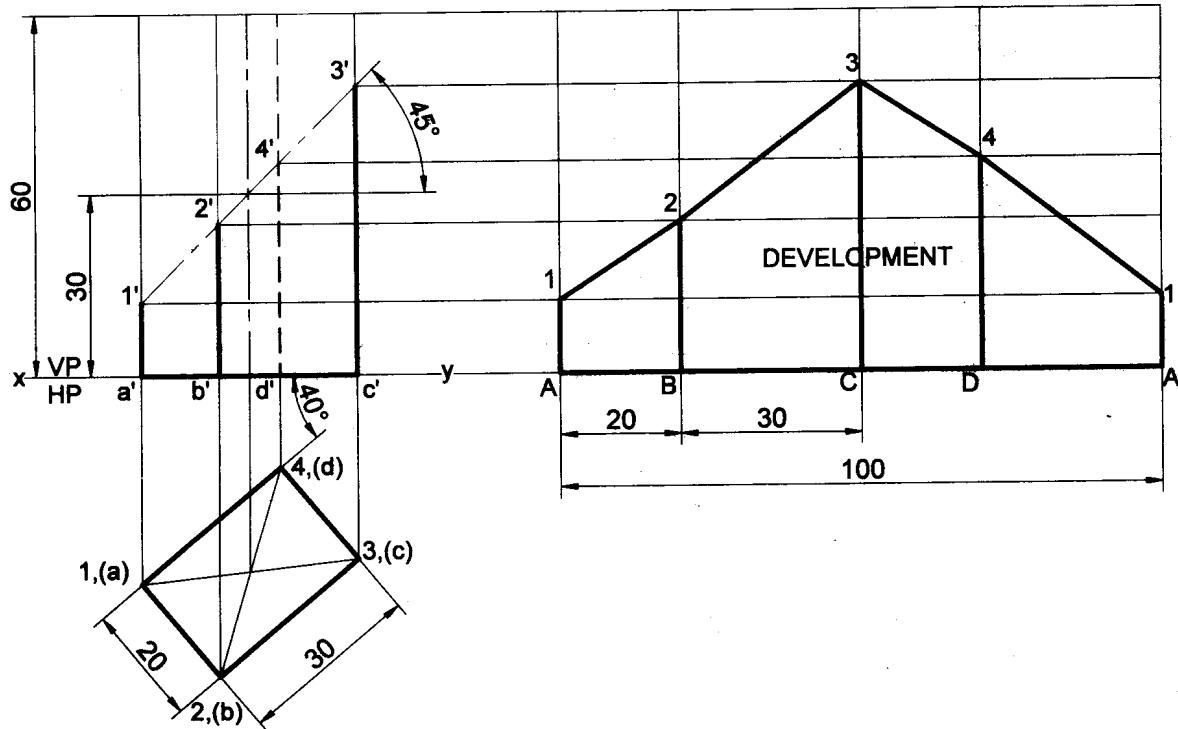
Problem 7 A rectangular prism of base 40mm x 25mm and height 65mm rests on HP on its base with the longer base side inclined at 30° to VP. It is cut by a plane inclined at 40° to HP, perpendicular to VP cuts the axis at its mid height. Draw the development of the remaining portion of the prism.

Solution



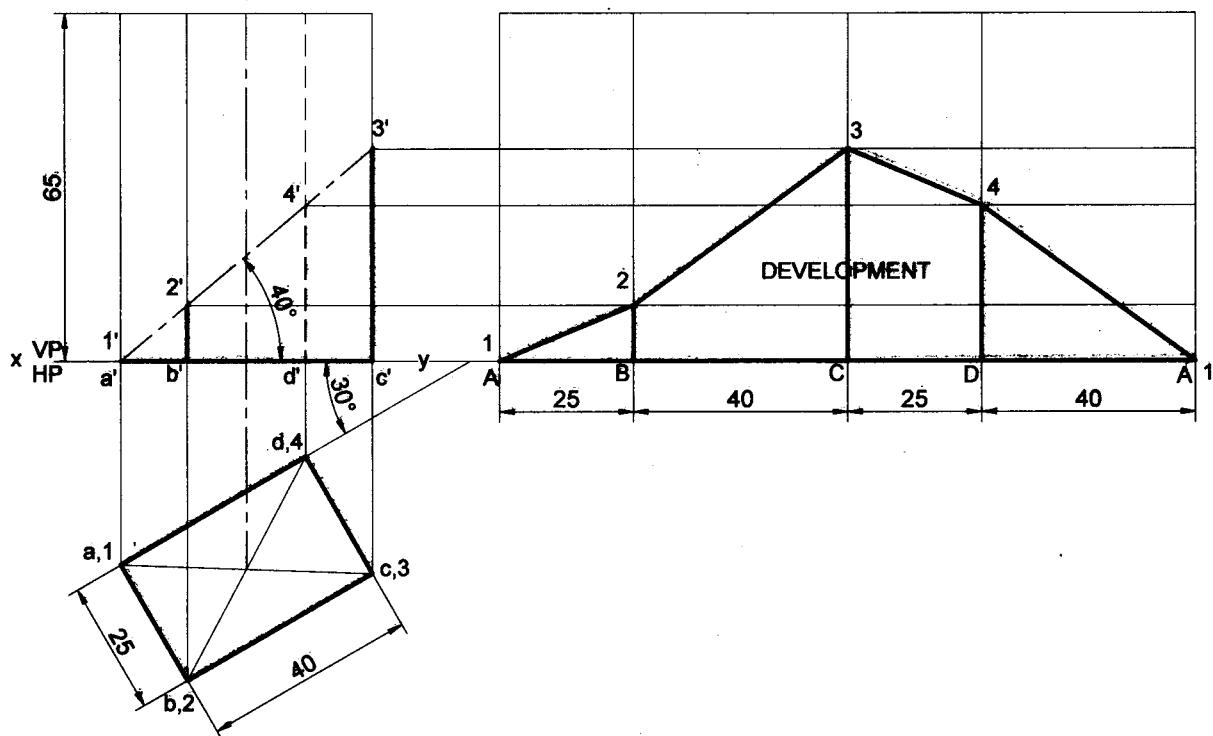
Problem 8 A rectangular prism of base 30mm x 20mm and height 60mm rests on HP on its base with the longer base side inclined at 40° to VP. It is cut by a plane inclined at 45° to HP, perpendicular to VP and bisects the axis. Draw the development of the lateral surface of the prism.

Solution



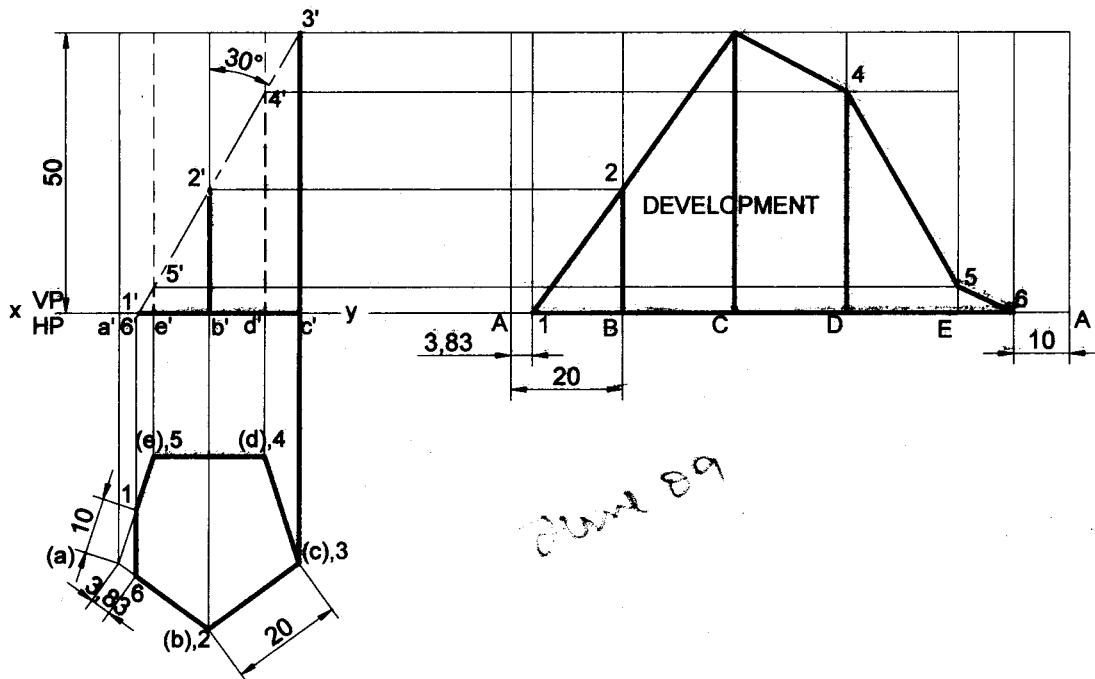
Problem 9 A rectangular prism of base size 25mmx40mm and axis length 65mm is resting on HP on its base with the longer side of base inclined at 30° to VP. It is cut by a plane inclined at 40° to HP and perpendicular to VP and passes through the extreme left corner of base. Draw the development of the lateral surface of the remaining portion of the prism.

Solution



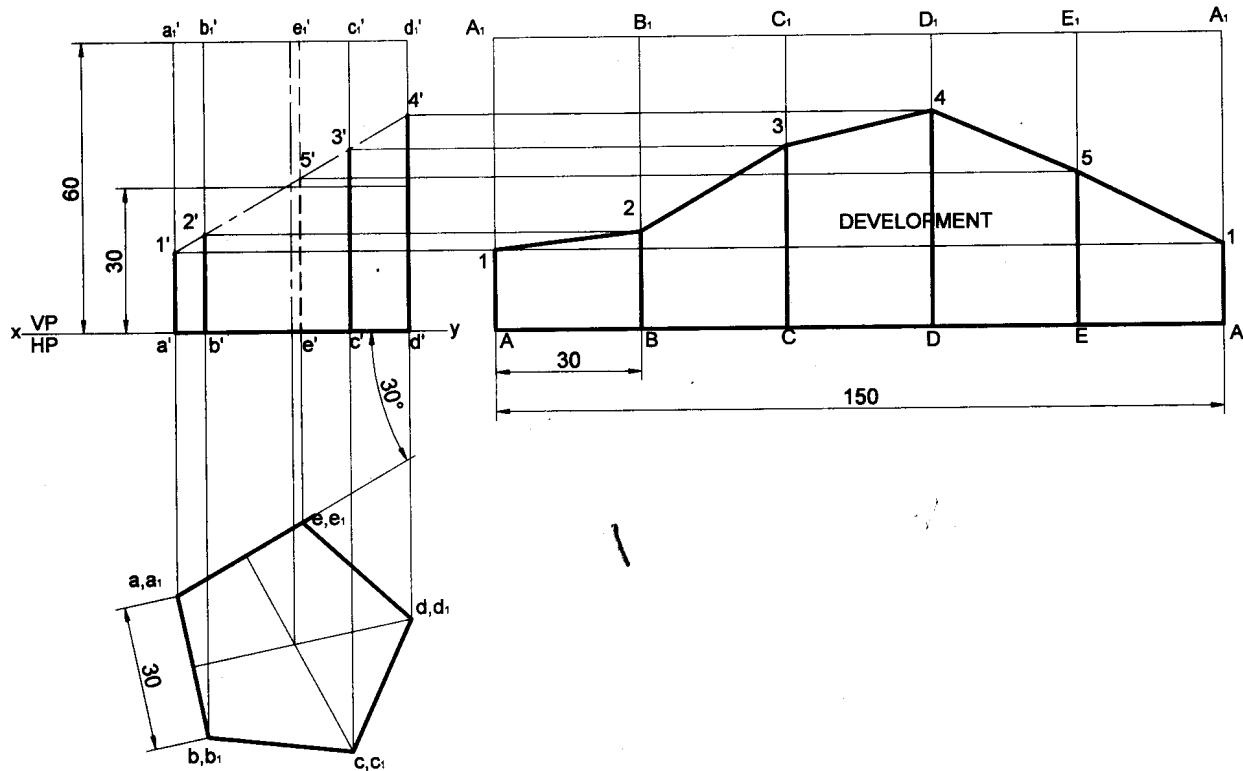
Problem 10 Draw the development of the truncated portion of the lateral faces of a pentagonal prism of 20mm sides of base and 50mm height standing vertically with one of its rectangular faces parallel to VP and nearer to it so as to produce a one piece development. The inclined face of the truncated prism is 30° to its axis and passes through the right extreme corner of the top face of the prism.

Solution



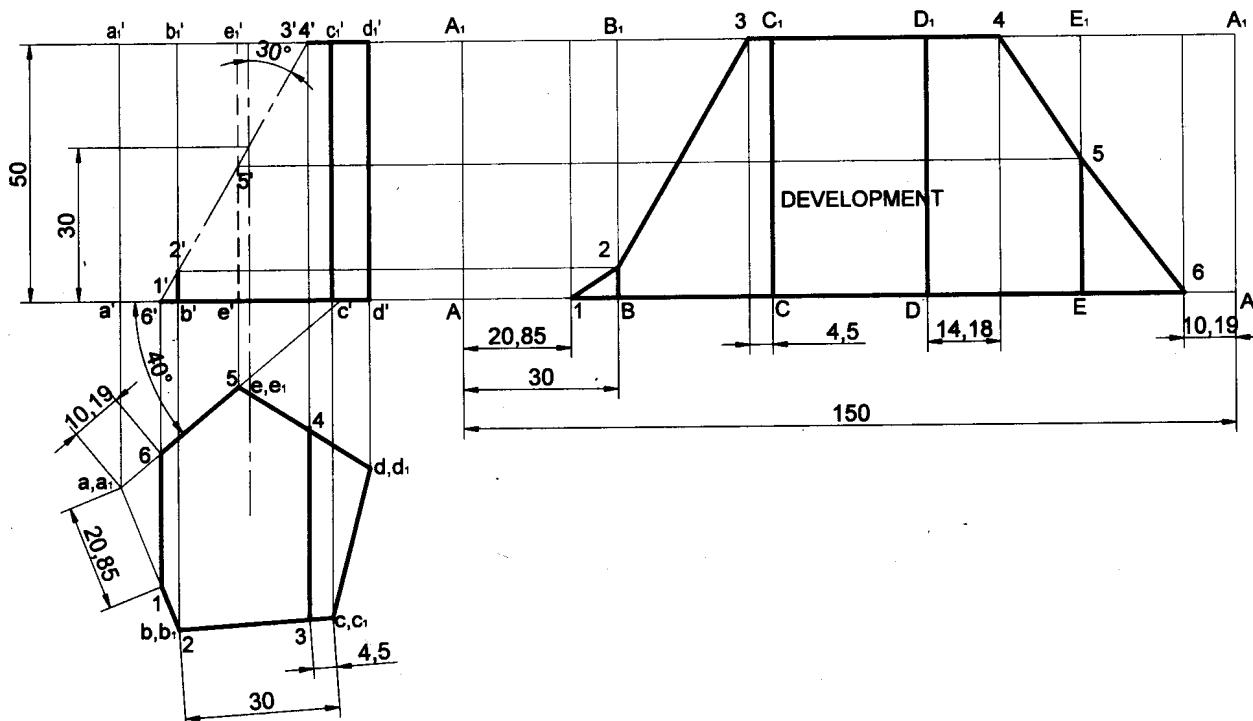
Problem 11 A regular pentagonal prism of height 60mm and base edge 30mm rests with its base on HP. The vertical face closest to VP is 30° to it. Draw the development of the truncated prism with its truncated surface inclined at 60° to its axis and bisecting it.

Solution



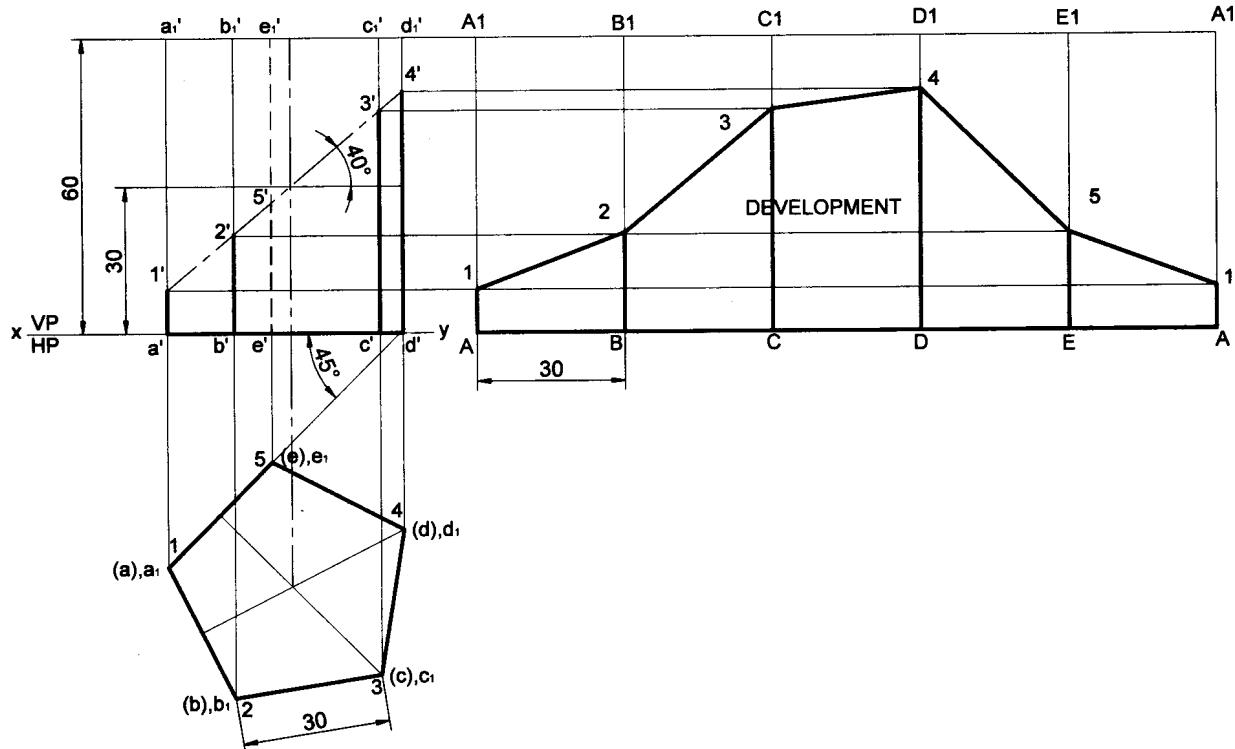
Problem 12 A pentagonal prism of 30mm side of base and height 50mm lies with its base on HP such that one of the rectangular faces is inclined at 40° to VP. It is cut to the shape of a truncated pyramid with the truncated surface inclined at 30° to the axis so as to pass through a point 30mm above the base. Develop the truncated portion of the prism so as to produce a one piece development.

Solution



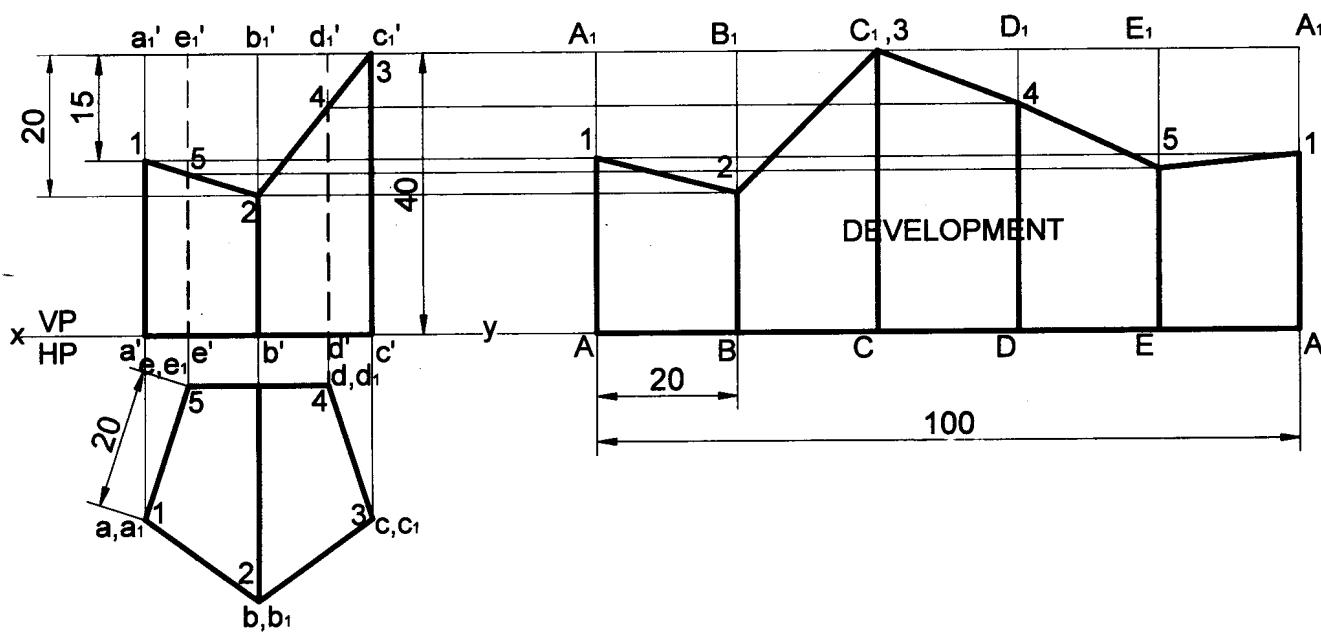
Problem 13 A pentagonal prism of base sides 30mm and axis length 60mm rests with its base on HP and an edge of the base inclined at 45° to VP. It is cut by a plane perpendicular to VP, inclined at 40° to HP and passing through a point on the axis, at a distance of 30 mm from the base. Develop the remaining surfaces of the truncated prism.

Solution



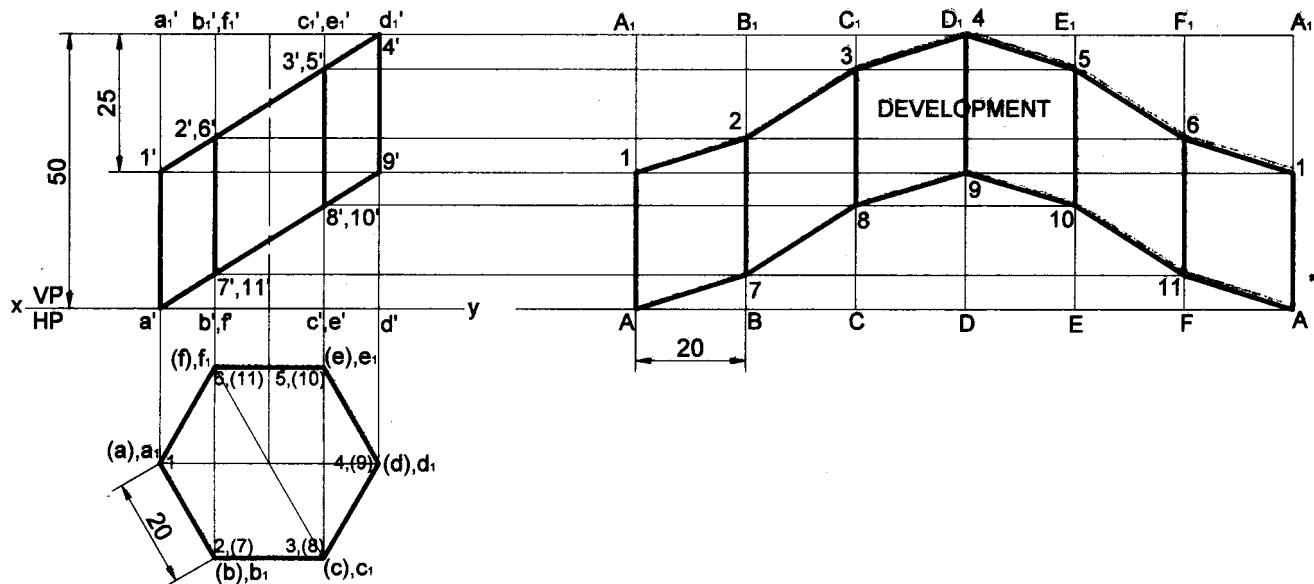
Problem 14 A pentagonal prism of base sides 20mm and height 40mm is resting with its base on HP and base edge parallel to the VP. The prism is cut as shown in the following front view. Draw the development of the lateral surface of the prism.

Solution



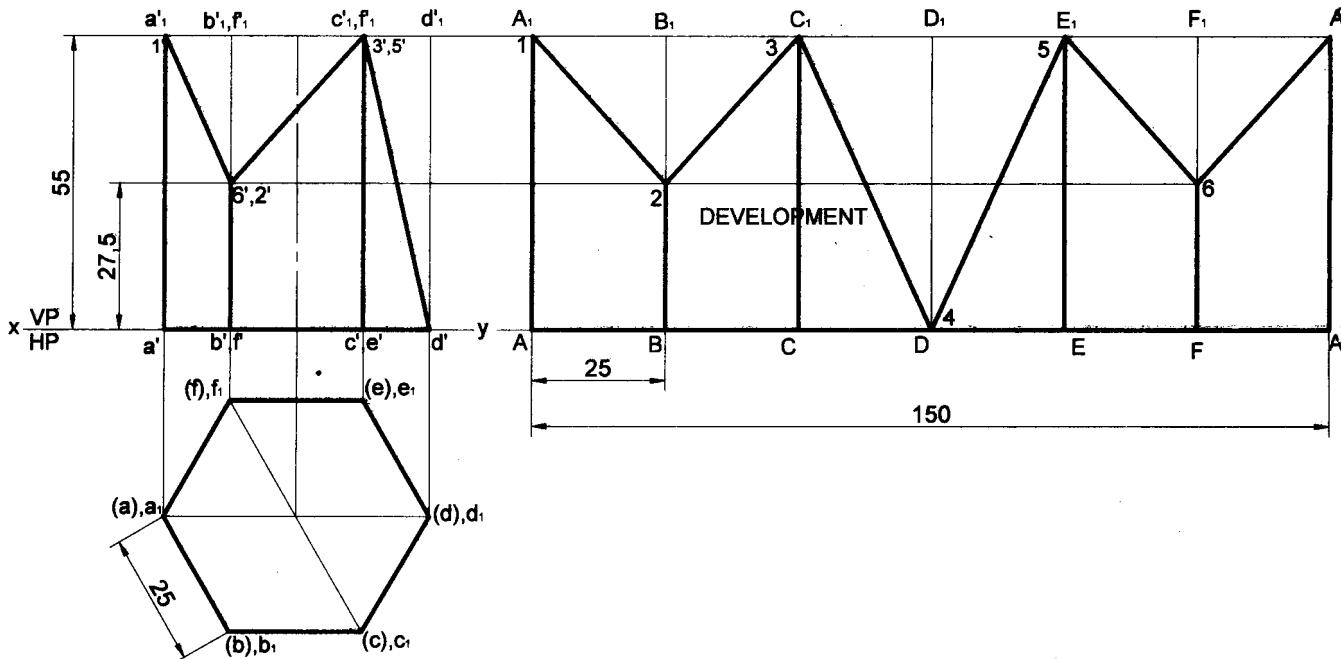
Problem 15 A hexagonal prism of base side 20mm and height 50mm is resting on HP on its base, such that one of its base edge is parallel to VP. The prism is cut in this position as shown in the following front view. Draw the development of the lateral surface of the prism.

Solution



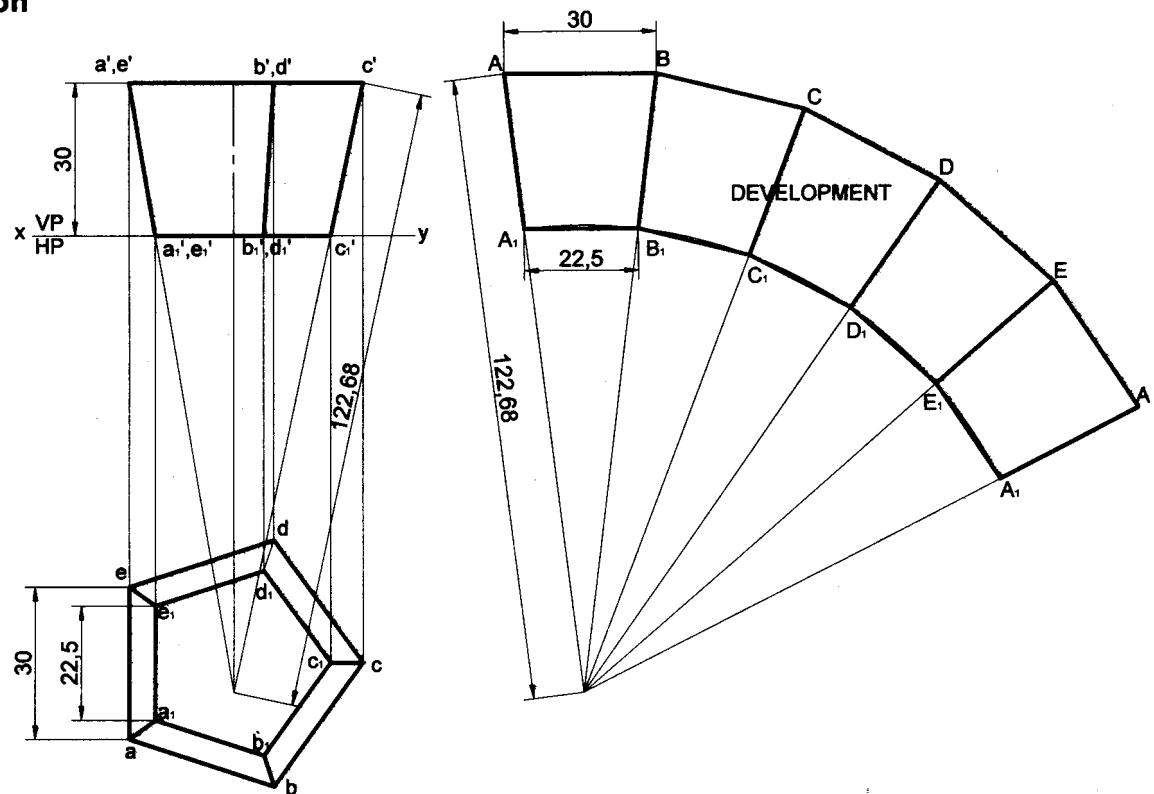
Problem 16 A hexagonal prism of base side 25mm and height 55mm is resting on HP on its base, such that one of its base edges is parallel to VP. The prism is cut in this position as shown in the following front view. Draw the development of the lateral surface of the prism.

Solution



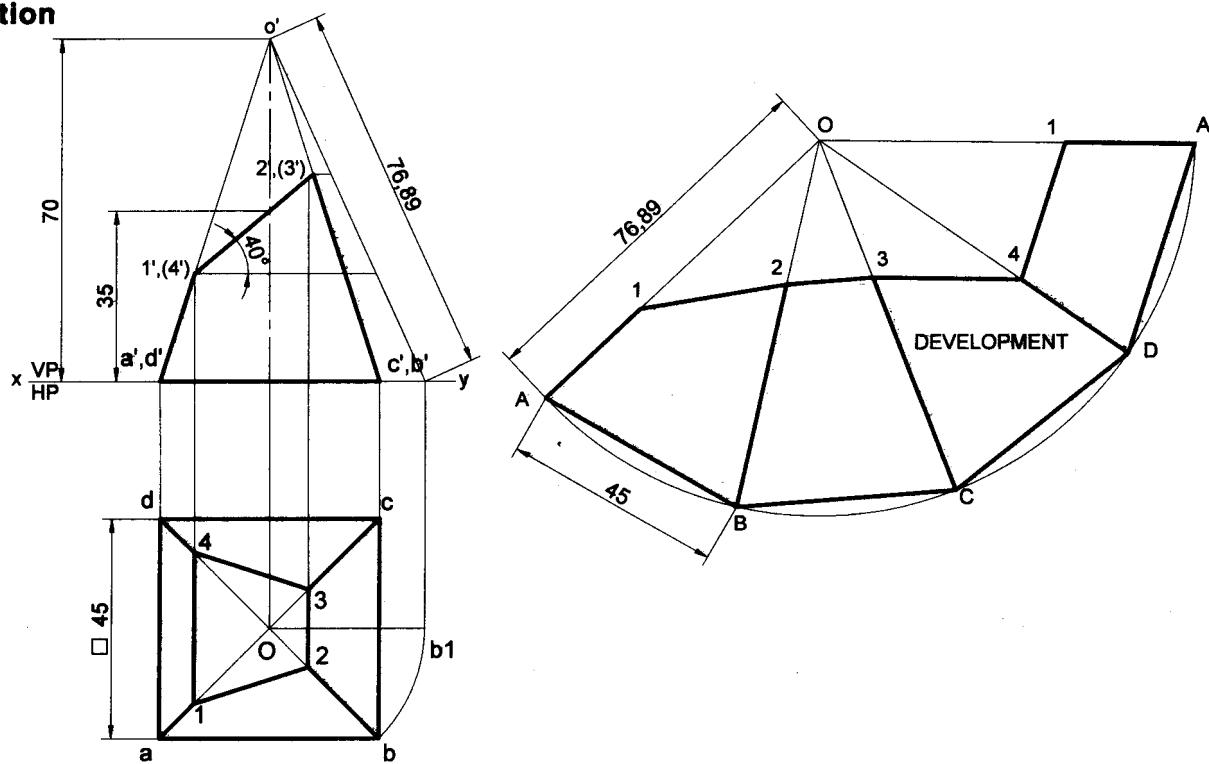
Problem 17 The inside of a hopper of a flour mill is to be lined with thin sheet. The top and bottom of the hopper are regular pentagons with each side equal to 30 mm and 22.5mm respectively. The height of the hopper is 30mm. Draw the shape of the sheet to which it is to be cut so as to fit into the hopper.

Solution



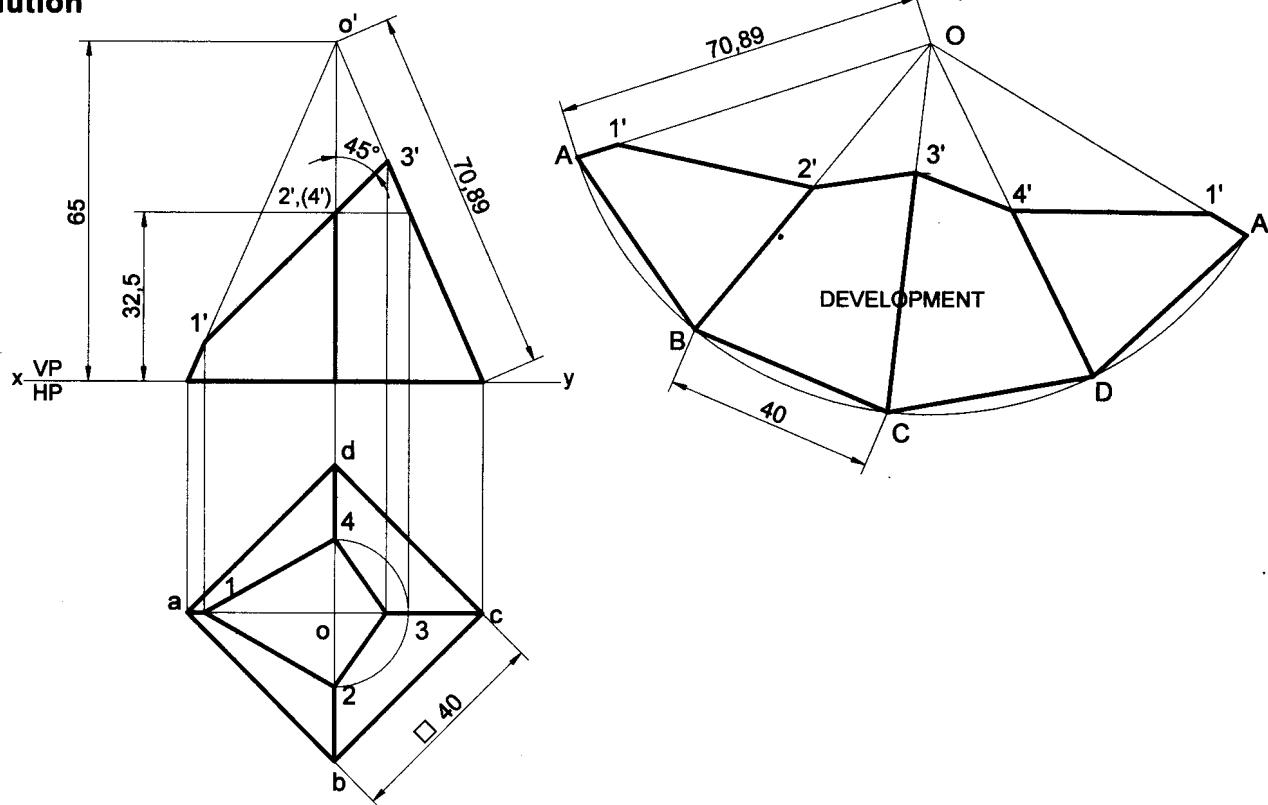
Problem 18 A square pyramid of side of base 45mm, altitude 70mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by a section plane which is perpendicular to the VP and inclined at 40° to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces the truncated pyramid.

Solution



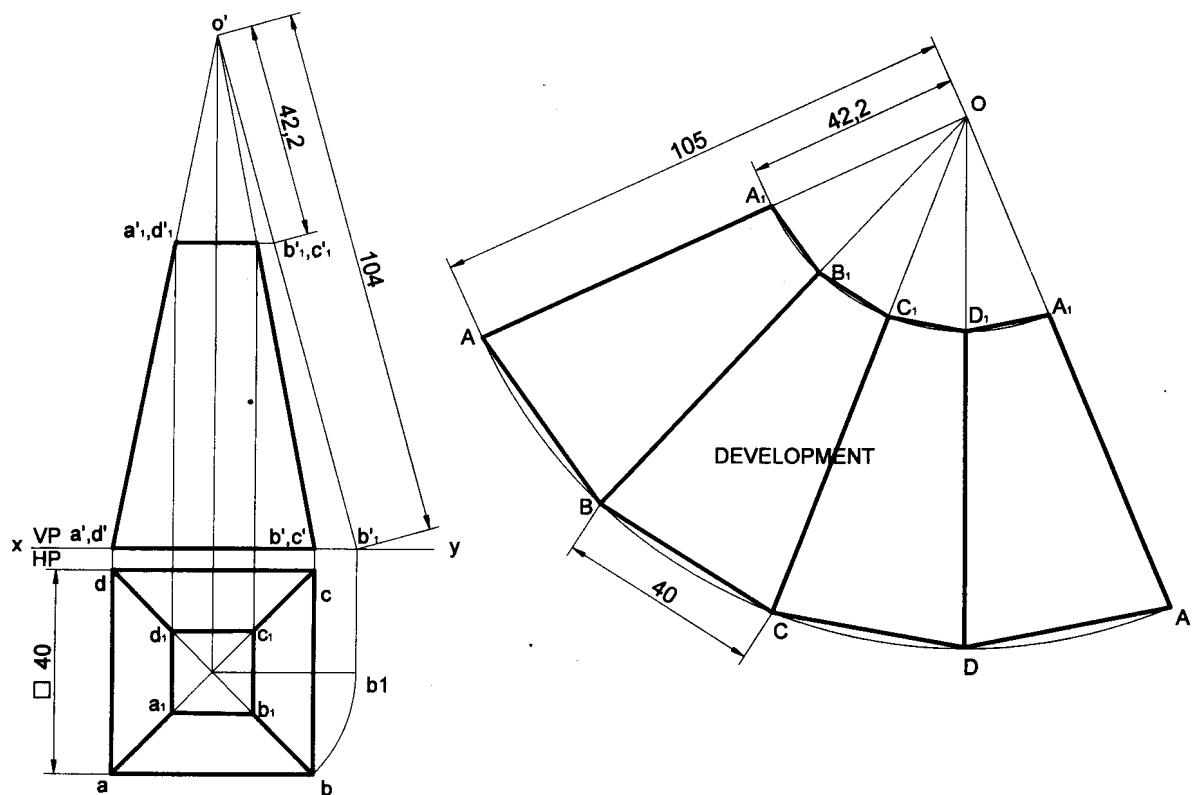
Problem 19 A square pyramid base 40mm side and axis 65mm long has its base on HP and all the edges of the base are equally inclined to VP. It is cut to with an inclined section plane so as the truncated surface at 45° to its axis, bisecting it. Draw the development of the truncated pyramid.

Solution



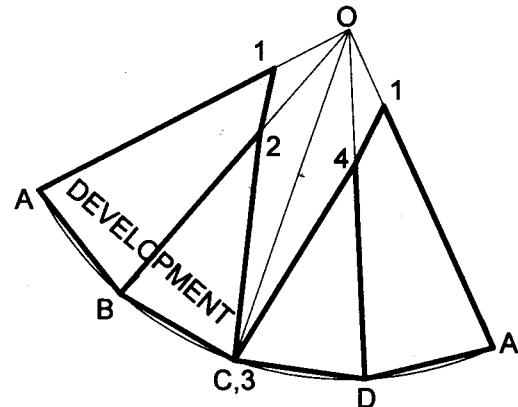
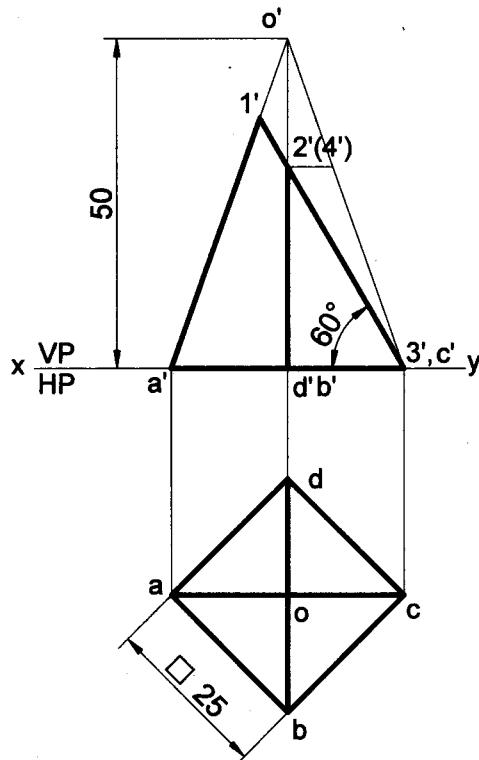
Problem 20 A frustum of a square pyramid has its base 40 mm sides, top 16 mm sides and height 60mm, its axis is vertical and a side of its base is parallel to VP. Draw the projections of the frustum and show the development of the lateral surfaces of it.

Solution



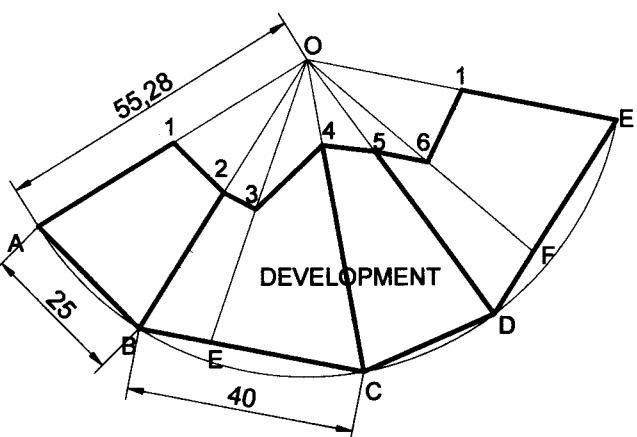
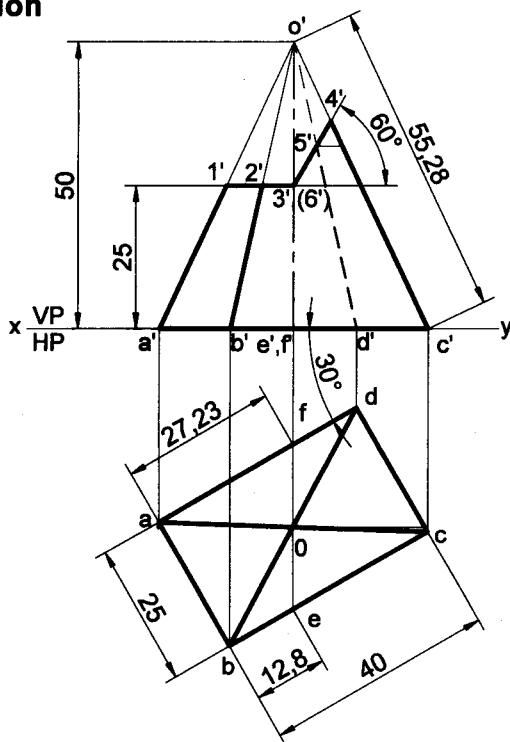
Problem 21 A square pyramid of 25mm base edge and 50mm height rests with its base on HP with all of its base edges equally inclined to VP. It is cut by a plane perpendicular to VP and inclined to HP at 60° , passing through the extreme right corner of base. Draw the development of the lateral surface of the pyramid.

Solution



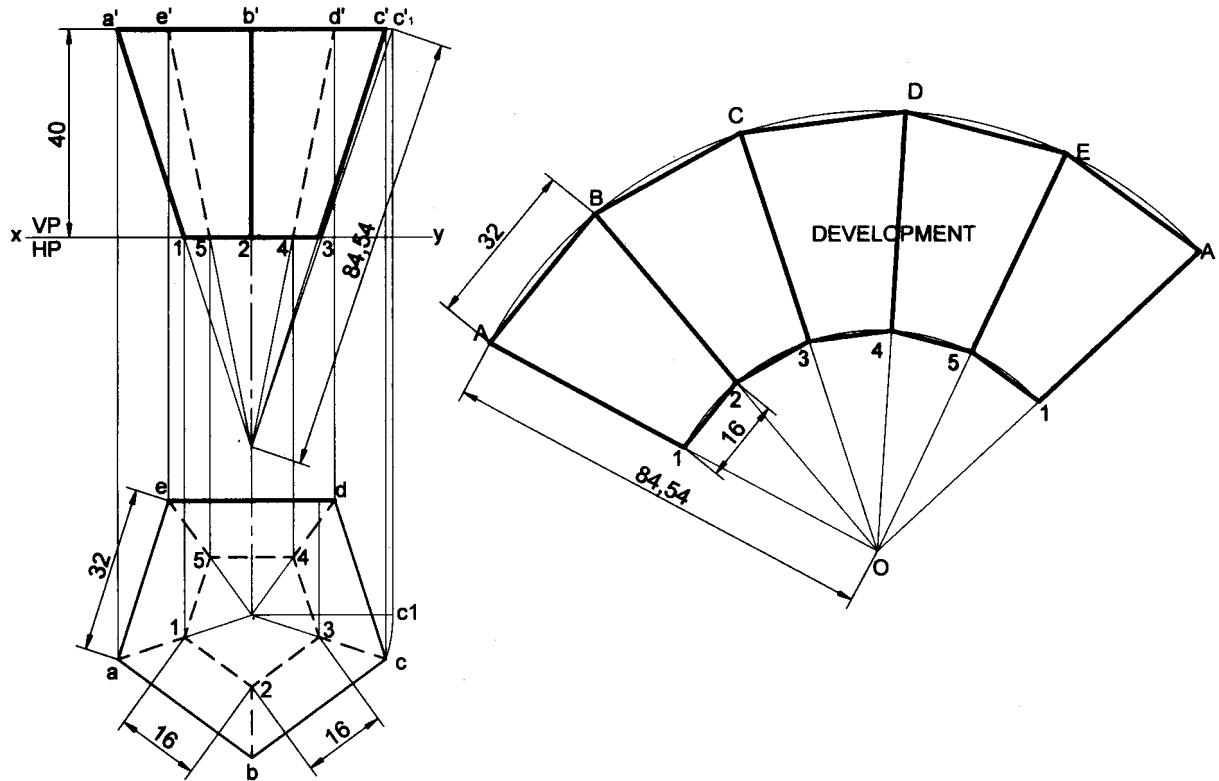
Problem 22 A rectangular pyramid, side of base 25mm x 40mm and height 50mm has one of the sides of the base is inclined at 30° to the VP. Draw the development of the lateral surface of the cut pyramid, whose front view is shown below.

Solution



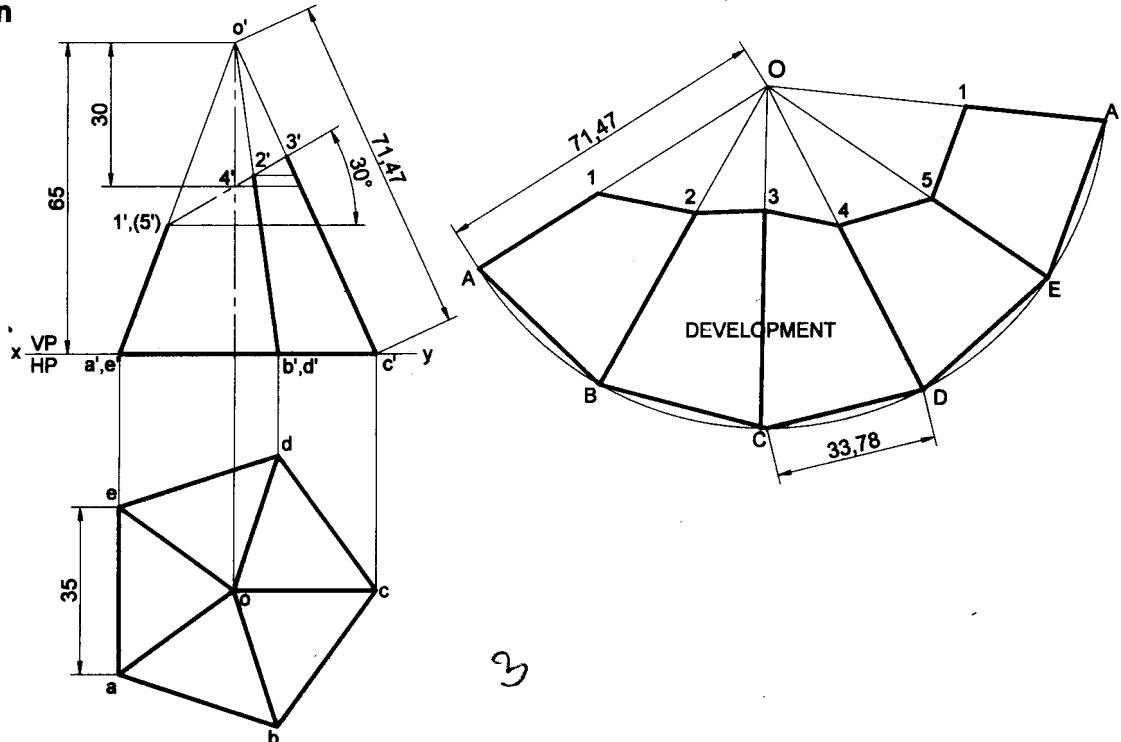
Problem 23 A frustum of a pentagonal pyramid, smaller base sides 16mm and bigger top face sides 32mm and height 40mm, is resting on the HP on its smaller base, with one of its base sides parallel to the VP. Draw the projections of the frustum and develop the lateral surface it.

Solution



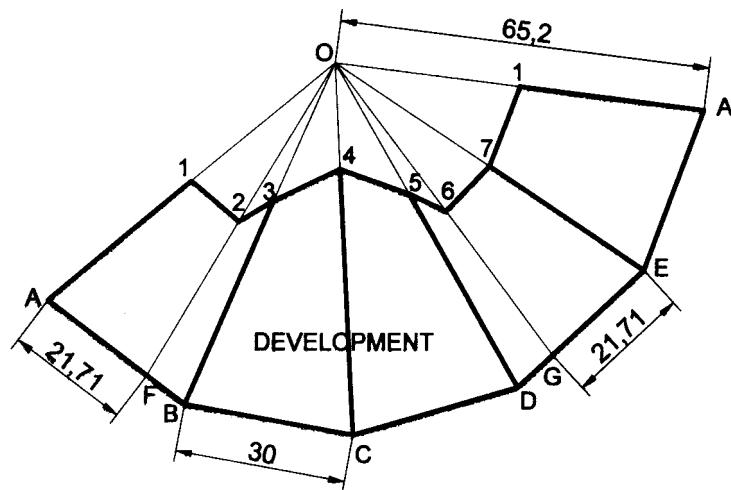
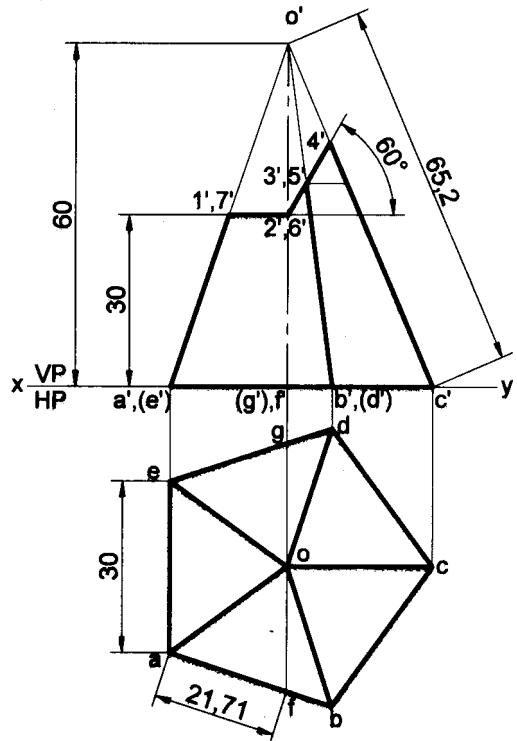
Problem 24 A regular pentagonal pyramid of side of base 35mm and altitude 65mm has its base on HP with a side of base perpendicular to VP. The pyramid is cut by a section plane which is perpendicular to the VP and inclined at 30° to HP. The cutting plane meets the axis of the pyramid at a point 30mm below the vertex. Obtain the development of the remaining part of the pyramid.

Solution



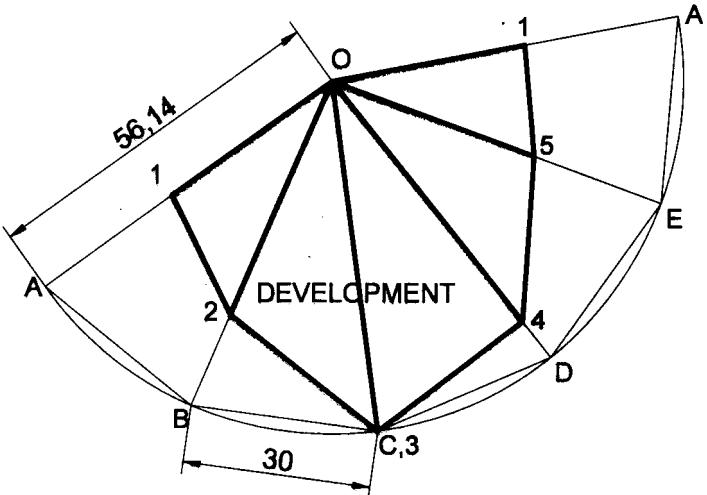
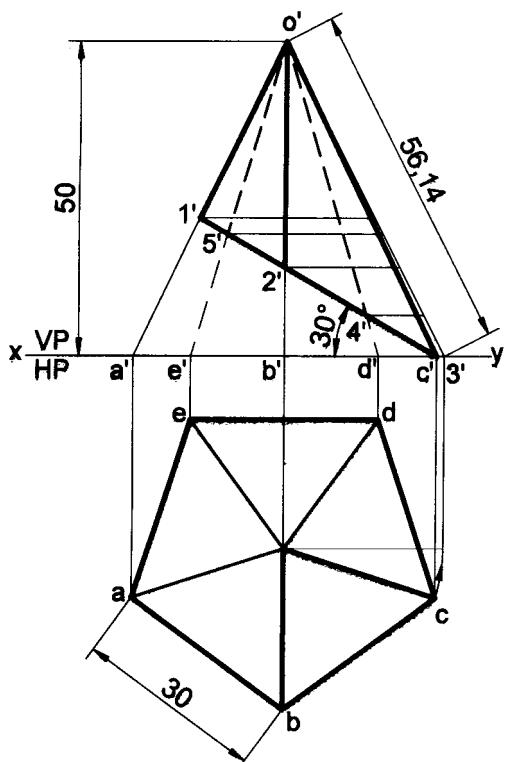
Problem 25 A pentagonal pyramid, 30mm sides, with a side of base perpendicular to VP. Draw the development of the lateral surfaces of the retained portion of the pyramid shown by the dark lines in the following figure.

Solution



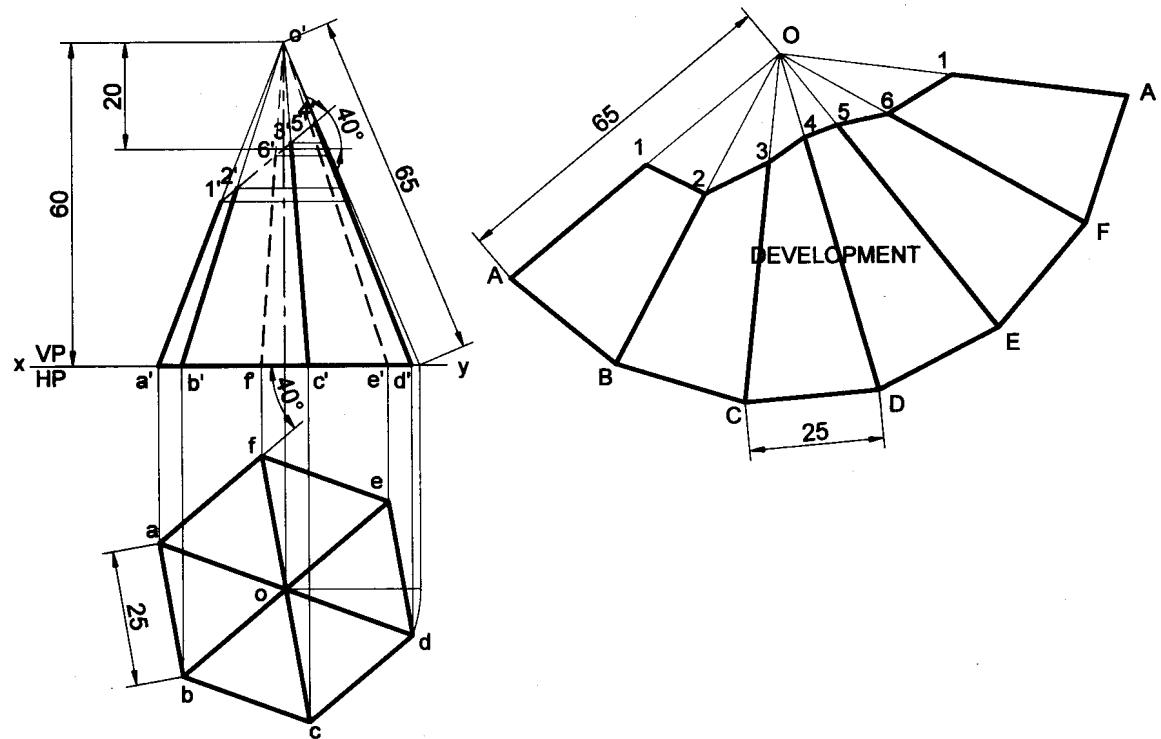
Problem 26 A pentagonal pyramid of 30mm edges of base and 50mm height rests vertically with one of its base edges parallel to VP and nearer to it. It is cut as shown in following figure. Draw the development of the lateral surfaces of the upper portion of the pyramid.

Solution



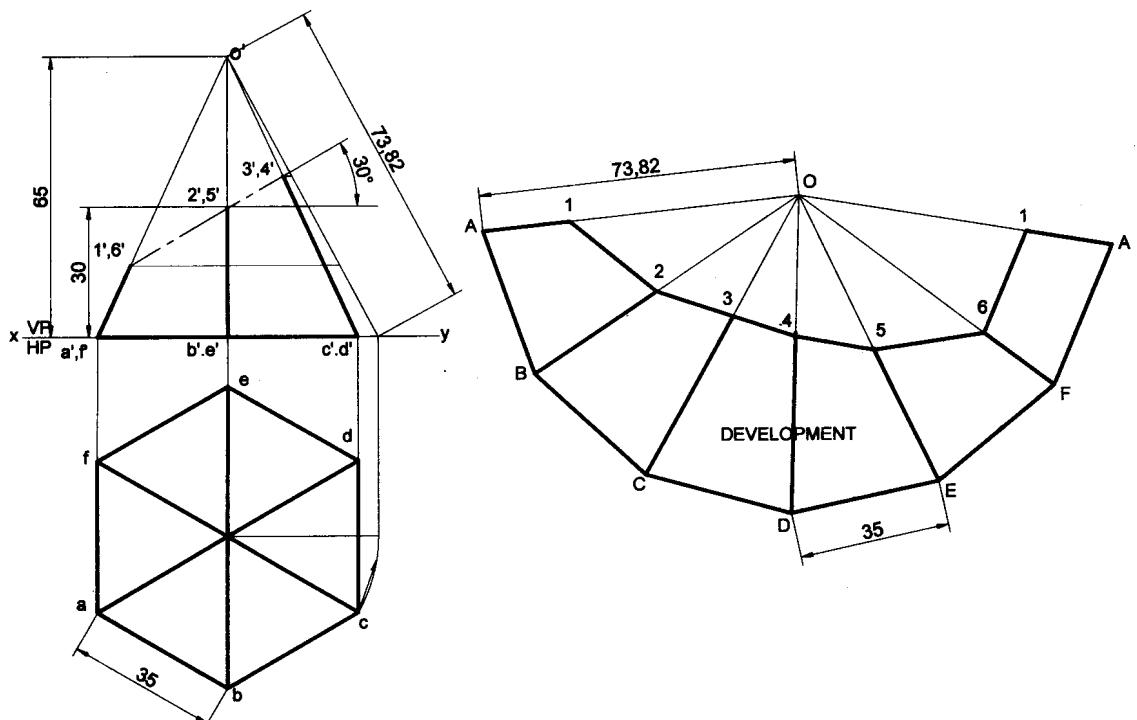
Problem 27 A hexagonal pyramid, base sides 25mm and height 60mm, is resting with its base on HP and an edge of base inclined at 40° to VP. It is cut to the shape of a truncated pyramid with the truncated surface indicated in the front view at a point on the axis 20mm from the apex and inclined at 40° to XY. Draw the projections and show the development of the lateral surface of the remaining portion of the pyramid.

Solution



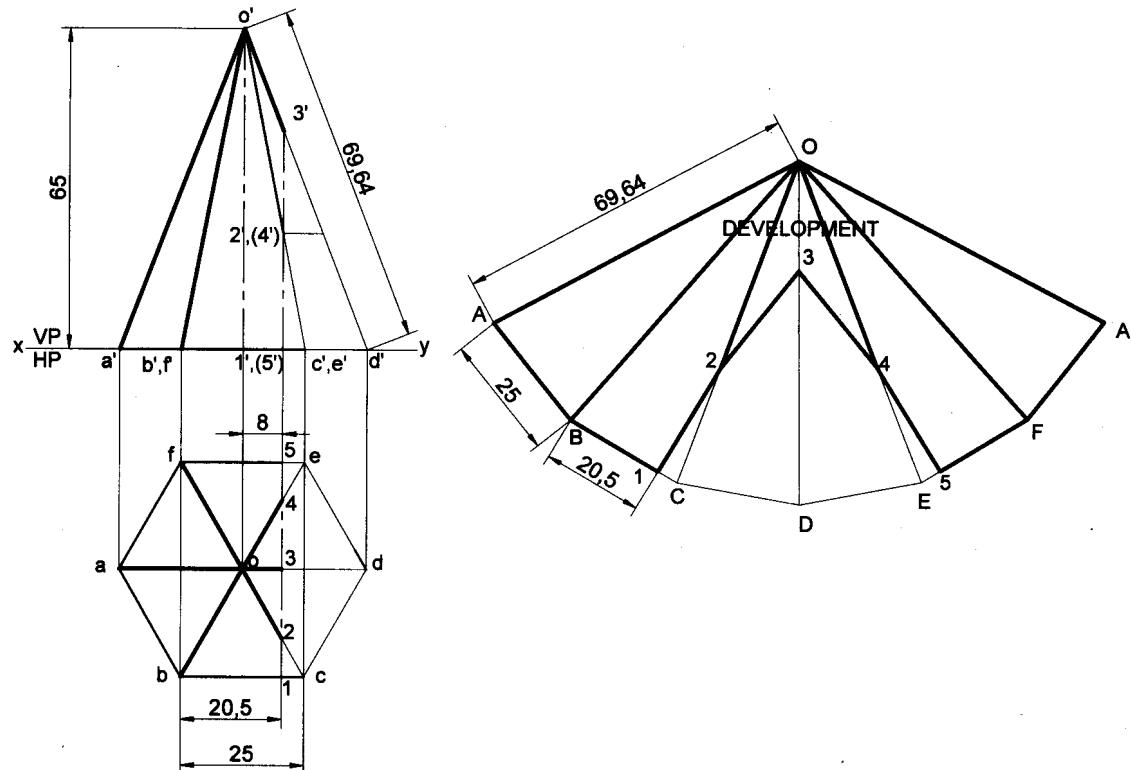
Problem 28 A hexagonal pyramid of sides 35mm and altitude 65mm is resting on HP on its base with two of the base sides perpendicular to VP. The pyramid is cut by a plane inclined at 30° to HP and perpendicular to VP and is intersecting the axis at 30mm above the base. Draw the development of the remaining portion of the pyramid.

Solution



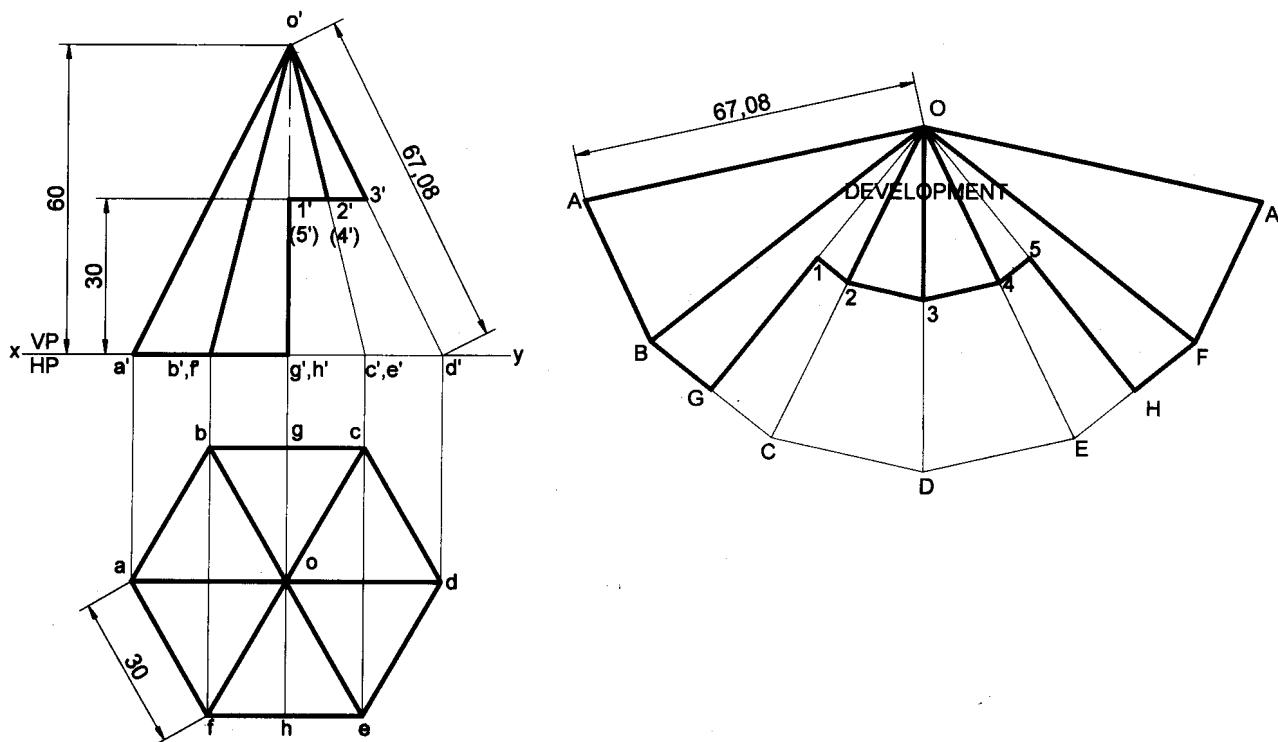
Problem 29 A hexagonal pyramid 25 mm side of base and axis 65 mm long is resting on its base on HP with one of the edges of the base parallel to VP. It is cut by a vertical section plane at a distance of 8 mm from the axis towards right side. Develop the lateral surface of the left part of the pyramid.

Solution



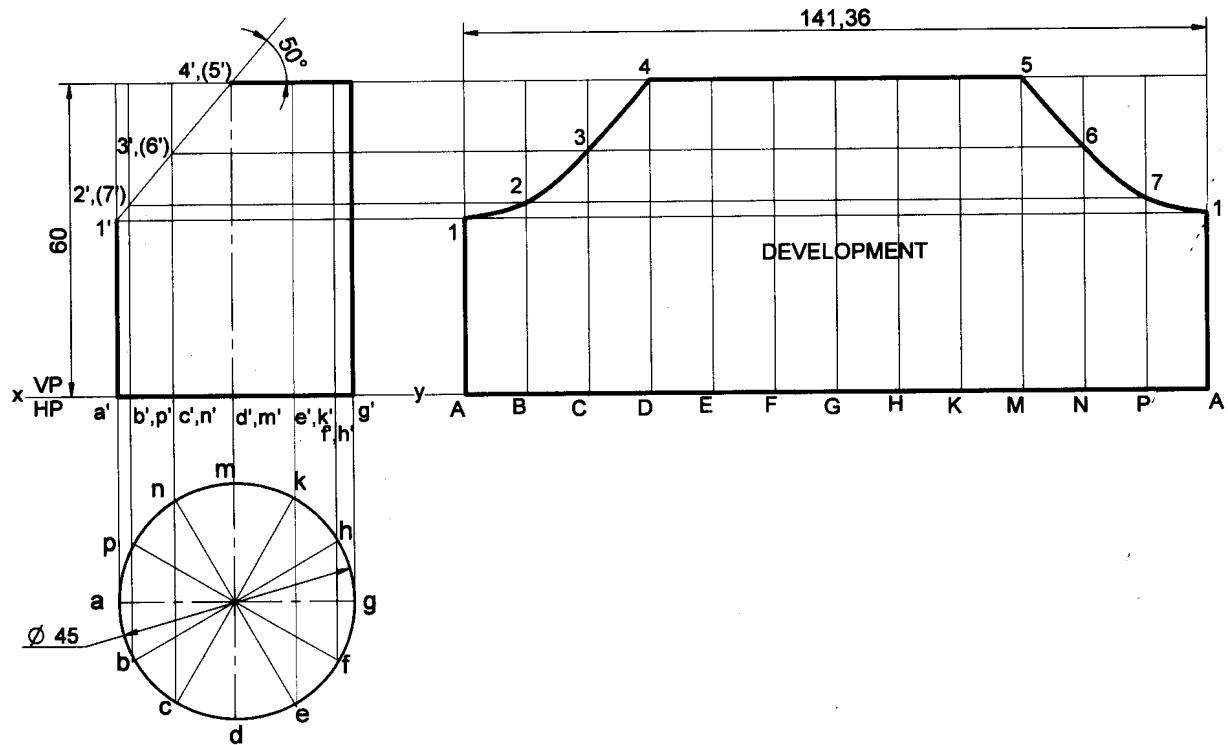
Problem 30 A hexagonal pyramid of 30mm base sides with a side of base parallel to VP. Draw the development of the lateral surfaces of the retained portions of the pyramid cut by two perpendicular planes shown by dark lines in the Fig.

Solution



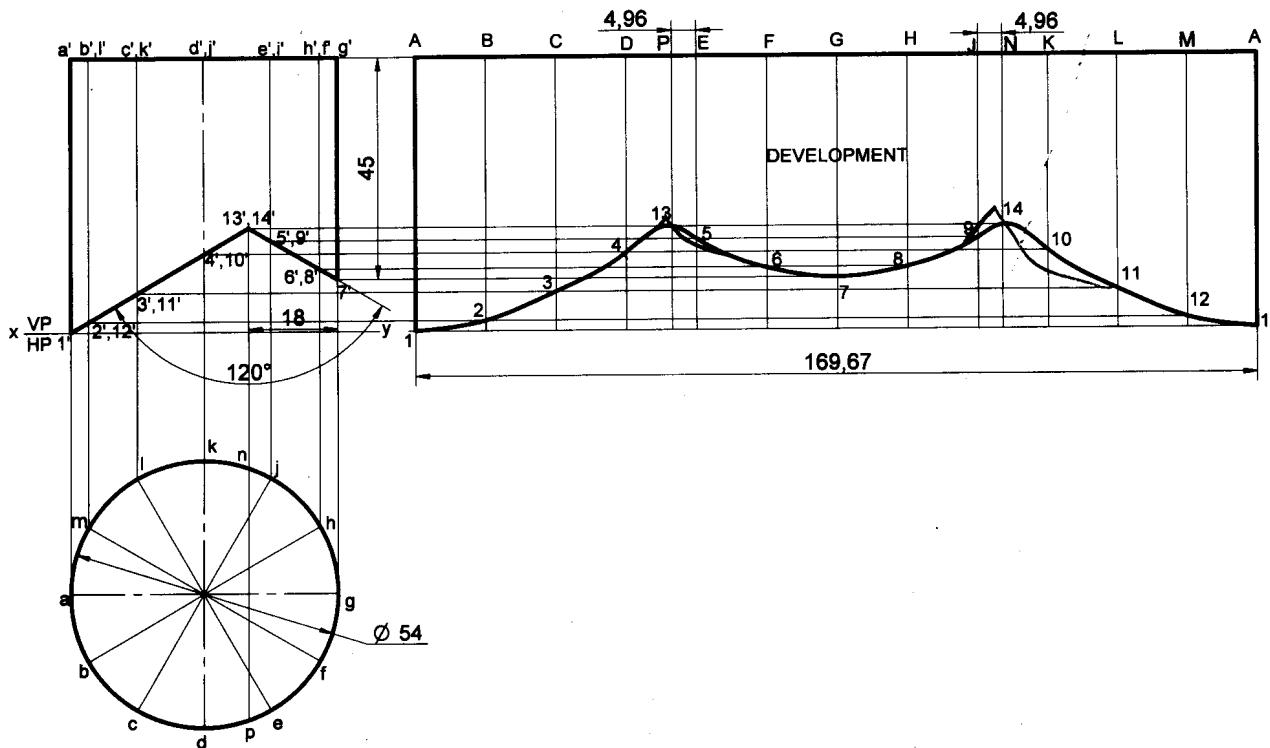
Problem 31 A vertical cylinder of base diameter 45mm and axis length 60mm is cut by a plane perpendicular to VP and inclined at 50° to HP, is passing through the centre point of the top face. Draw the development of the lateral surface of the cylinder.

Solution



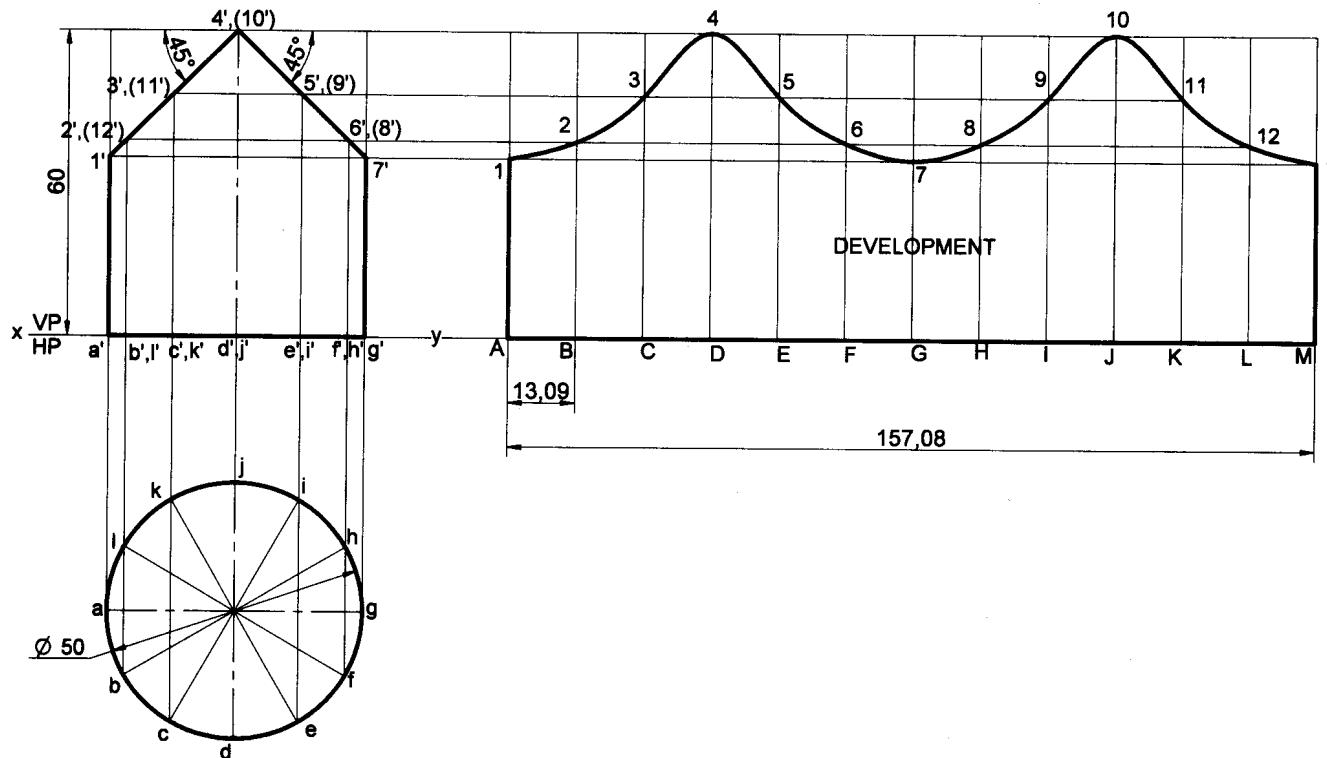
Problem 32 Following figure shows the front view of a model of a steel chimney of diameter 60mm made from a flat thin sheet metal fitted over an inclined plane roof. Develop the portion of the chimney.

Solution



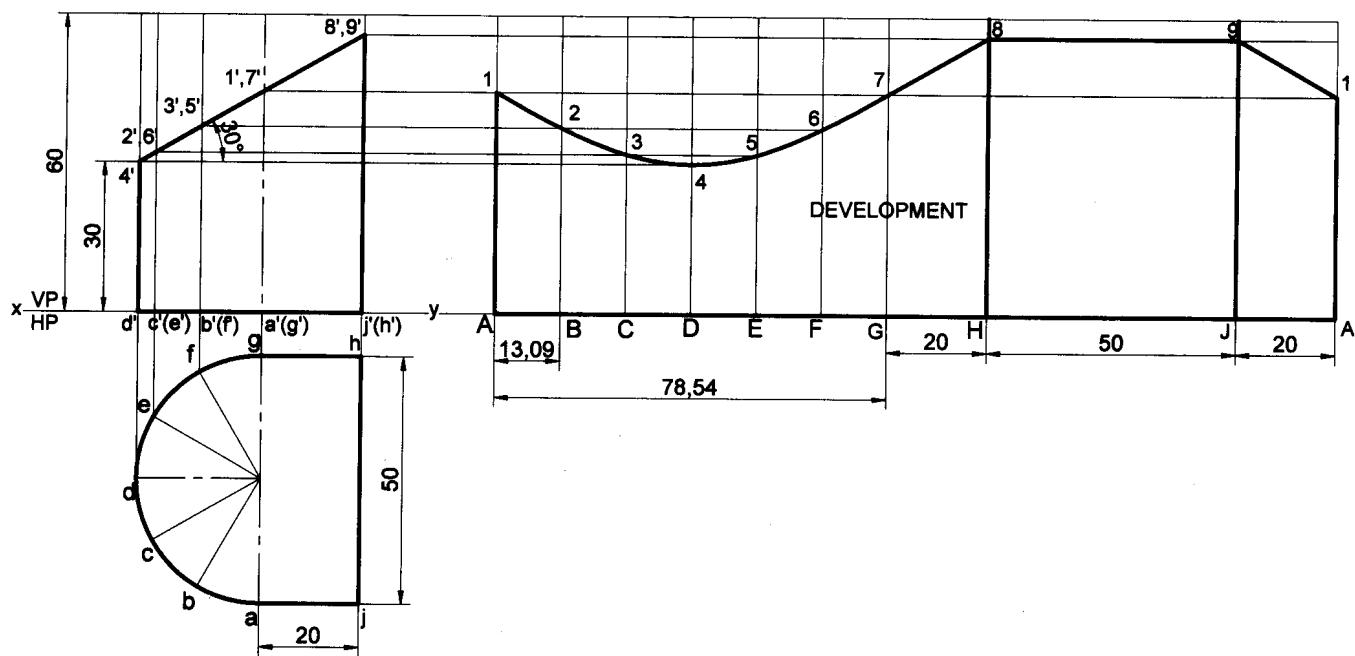
Problem 33 A vertical cylinder of base diameter 50mm and axis length 60mm is cut by a two planes which are perpendicular to VP and inclined at 45° to HP and passing through either side the centre point of the top face. Draw the development of the lateral surface of the cylinder.

Solution



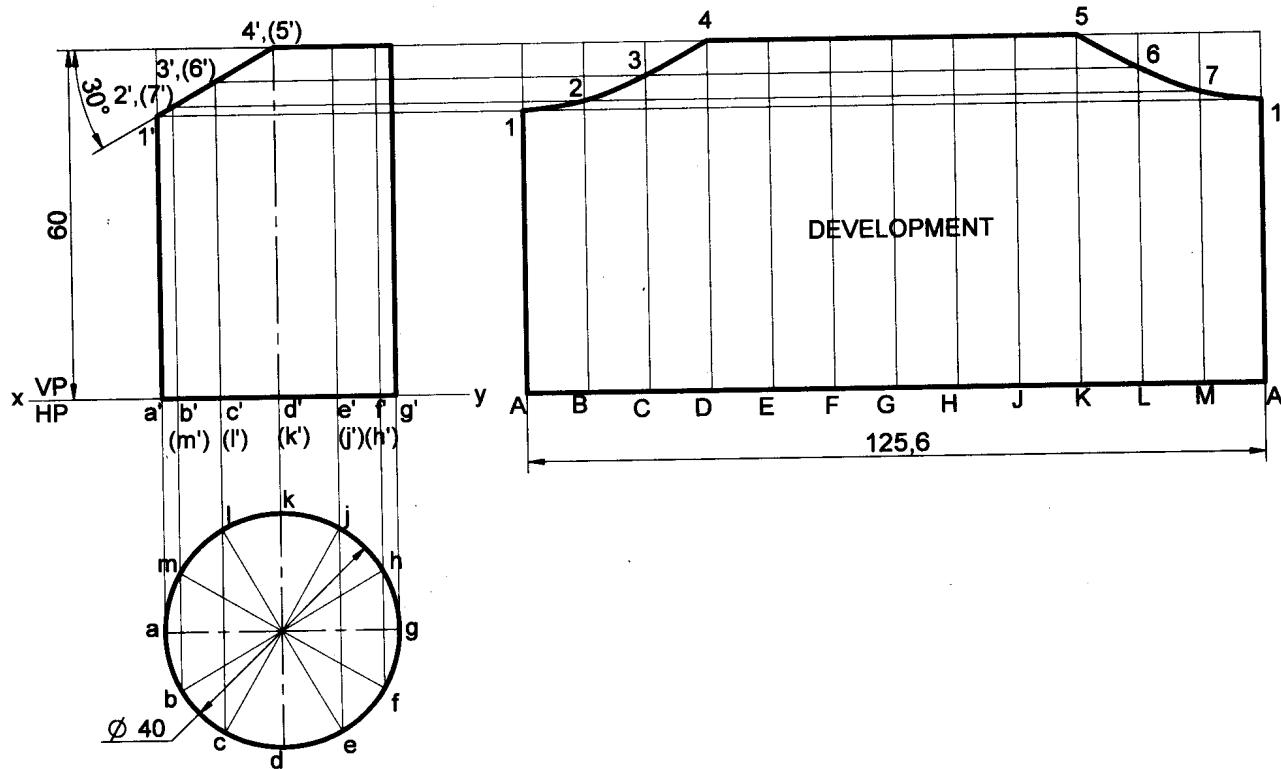
Problem 34 A pipe made of using a half tubular (circular) with a half square in shape is cut as shown in the following figure. Draw the development of the lateral surface of the object.

Solution



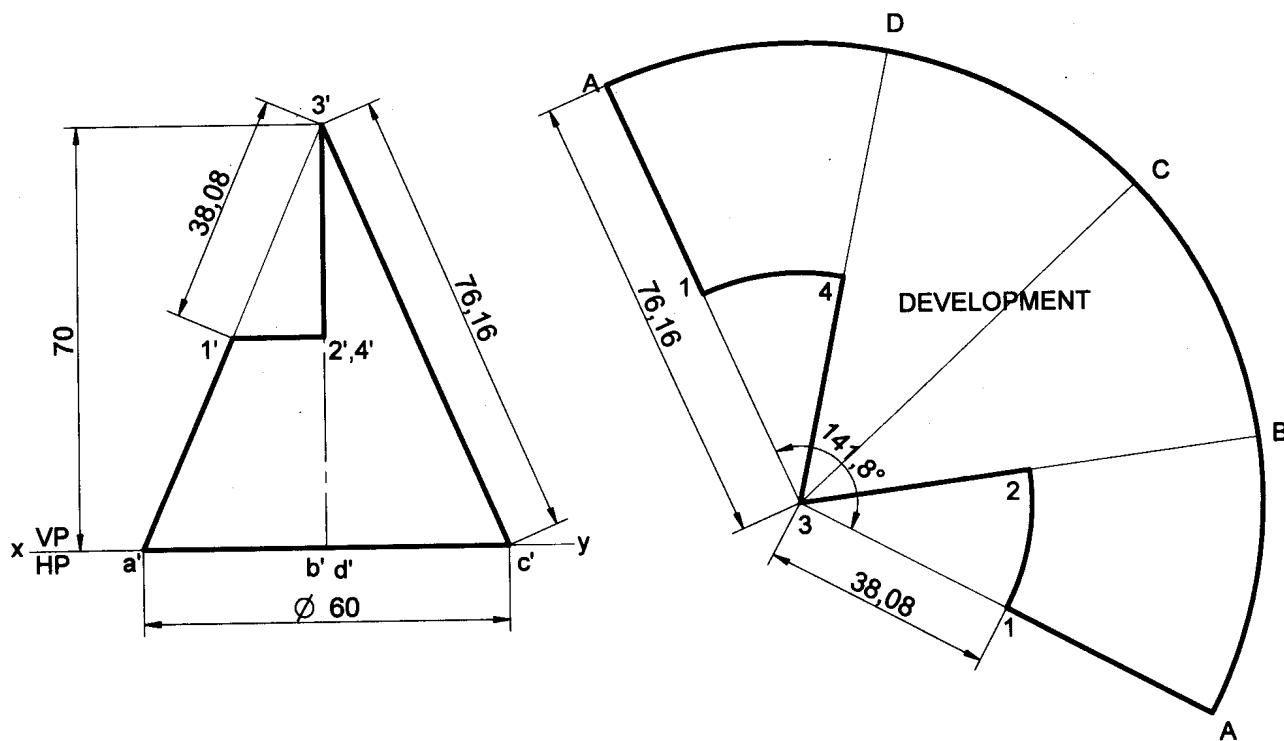
Problem 35 Develop the lateral surface of the cylinder of 40mm diameter and height 60mm which is cut in the following way.

Solution



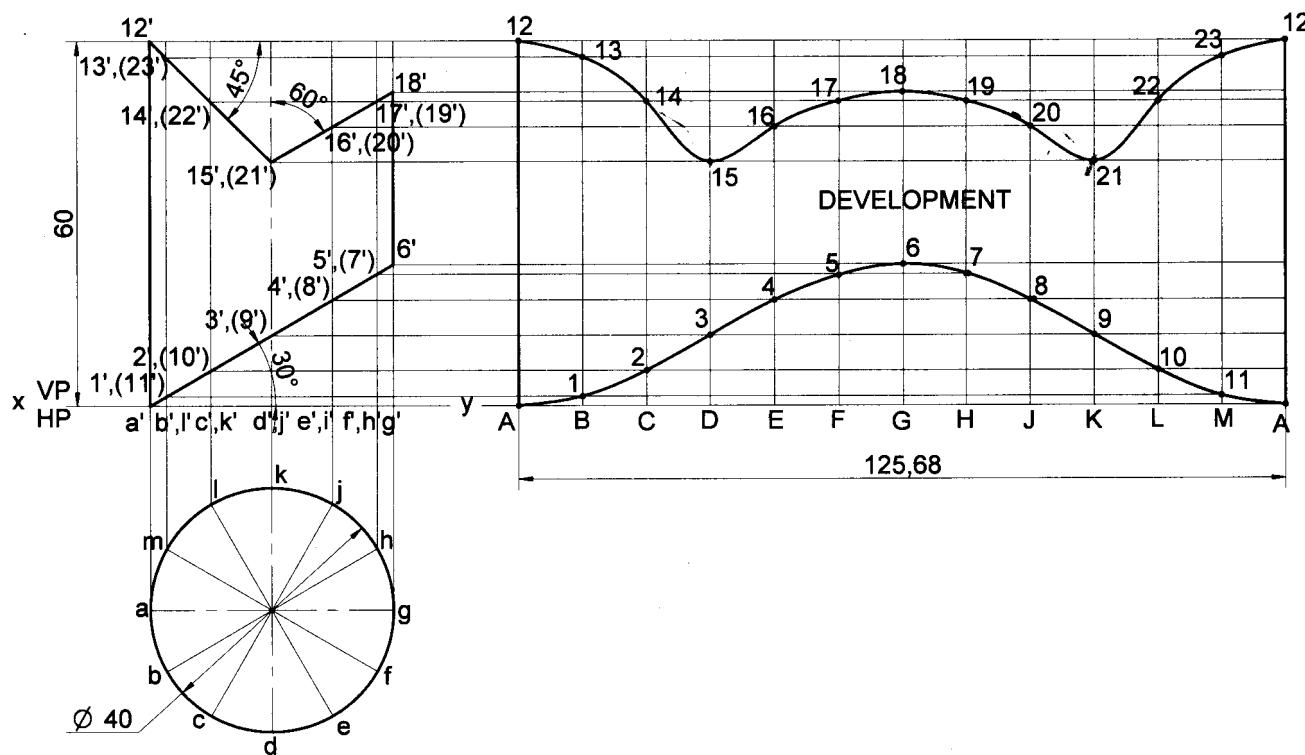
Problem 36 A cone of base diameter 60mm and height 70mm is resting on its base on HP. It is cut as shown in the following figure. Draw the development of the lateral surface of the remaining portion of the cone.

Solution



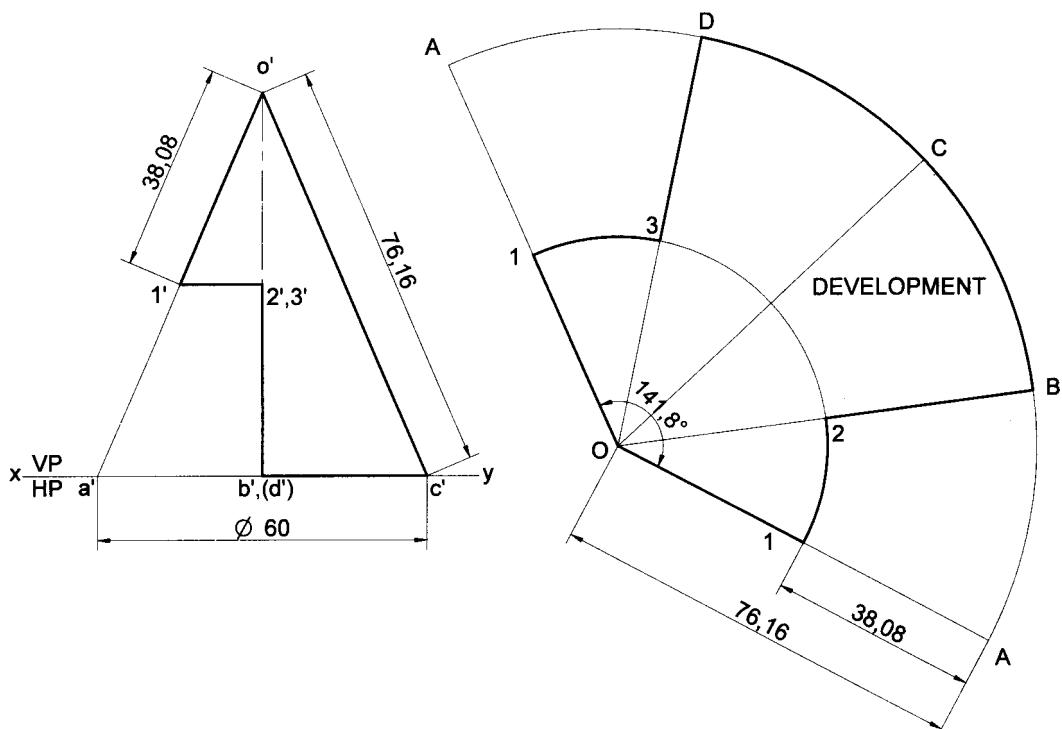
Problem 37 Develop the lateral surface of the cylinder of 40mm diameter and height 60mm which is cut in the following way.

Solution



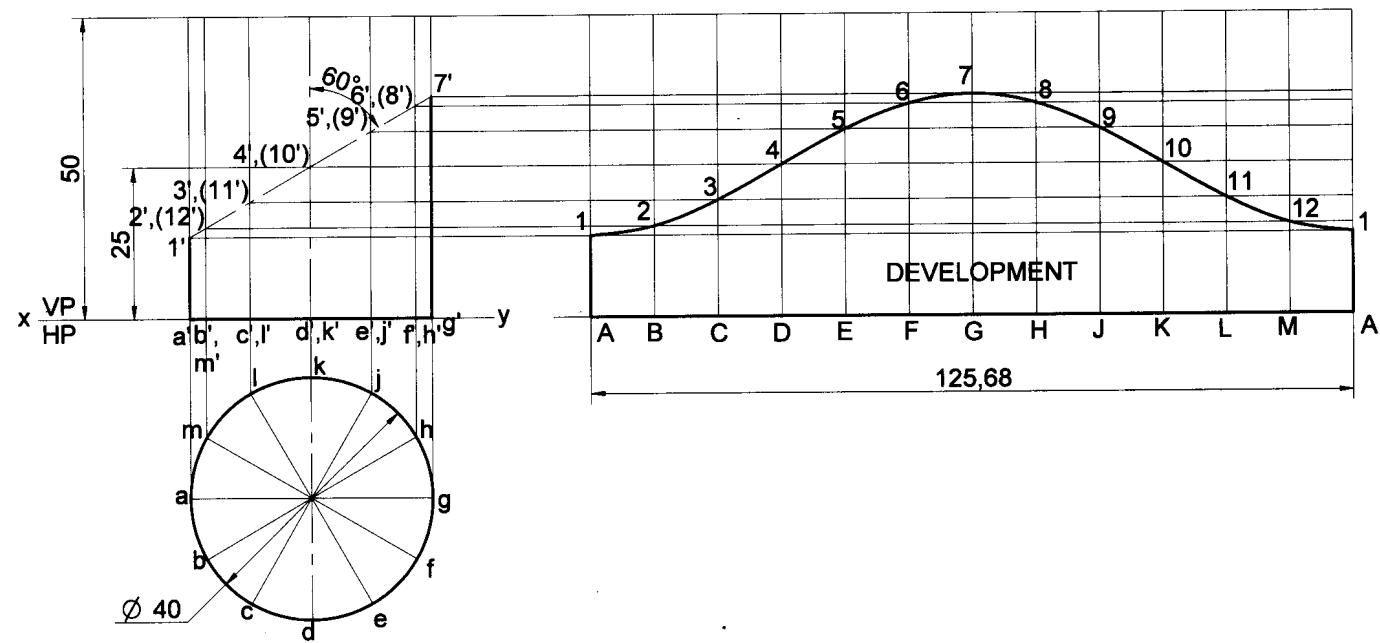
Problem 38 A cone of base diameter 60mm and height 70mm is resting on its base on HP. It is cut as shown in the following figure. Draw the development of the lateral surface of the remaining portion of the cone.

Solution



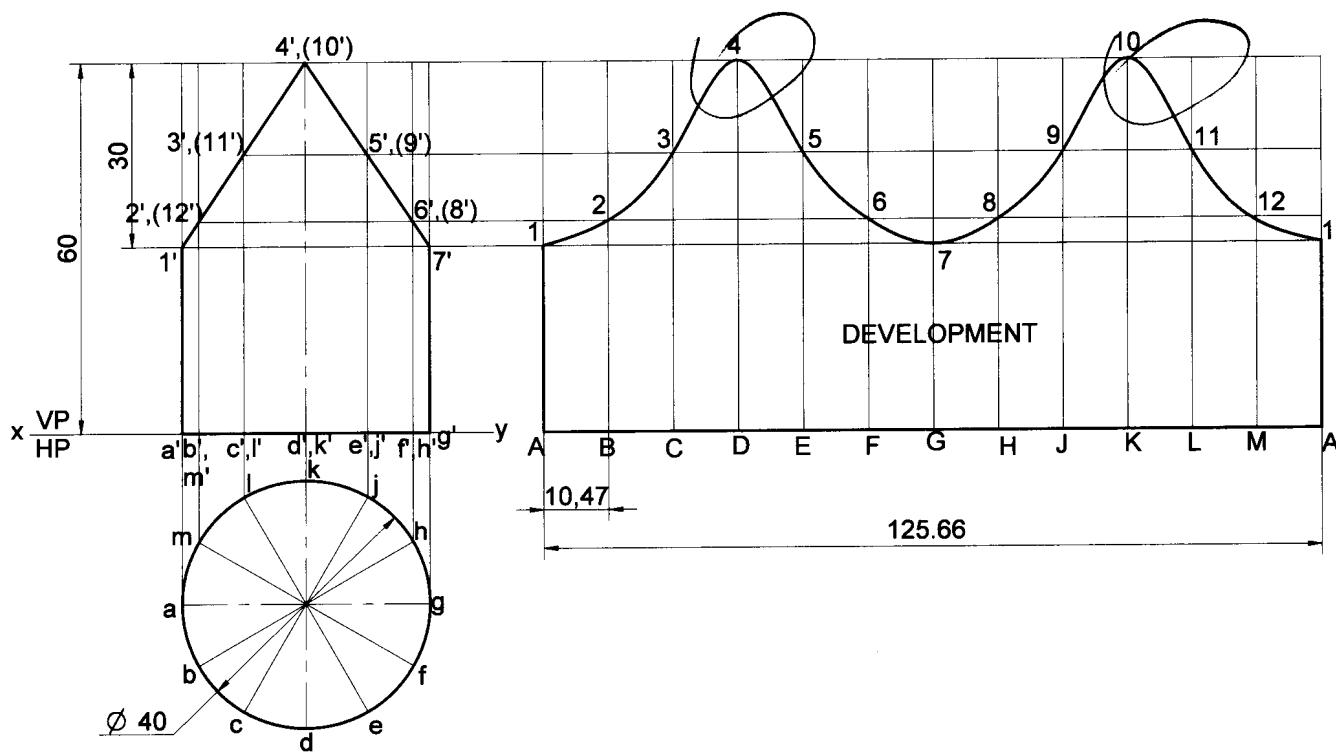
Problem 39 Draw the development of the lateral surface of a truncated vertical cylinder, 40mm diameter of base and height 50mm, the truncated flat surface of the cylinder bisects the axis at 60° to it.

Solution



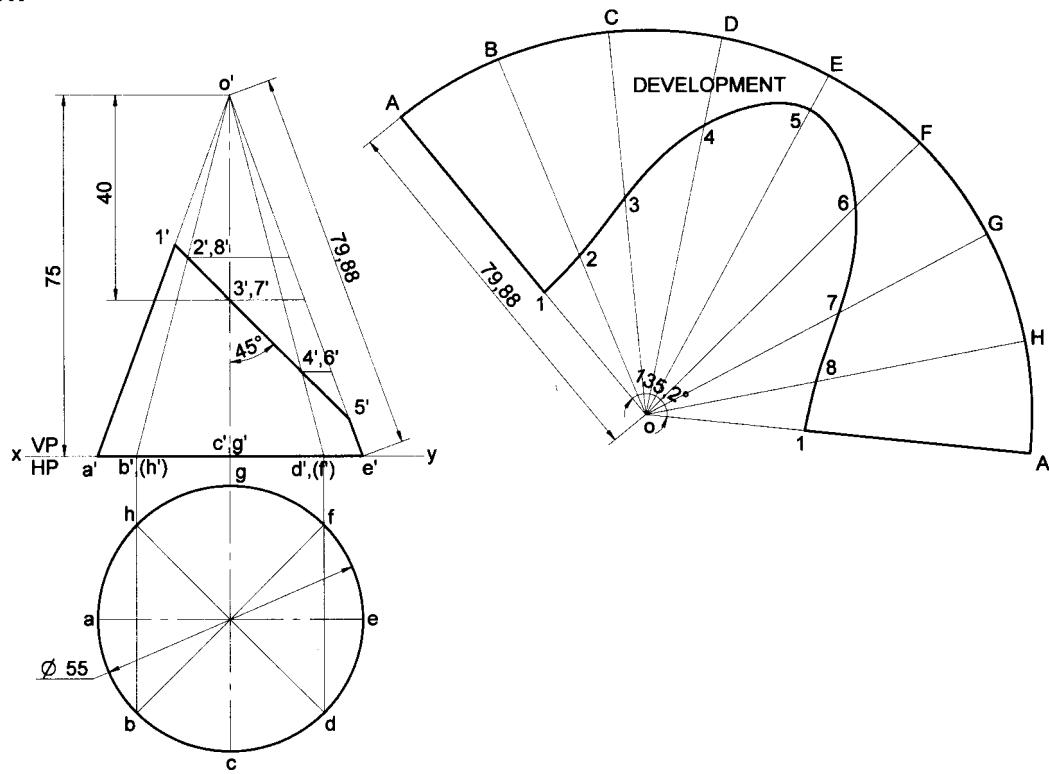
Problem 40 Develop the lateral surface of the cylinder of 40mm diameter and height 60mm cut in the following way.

Solution



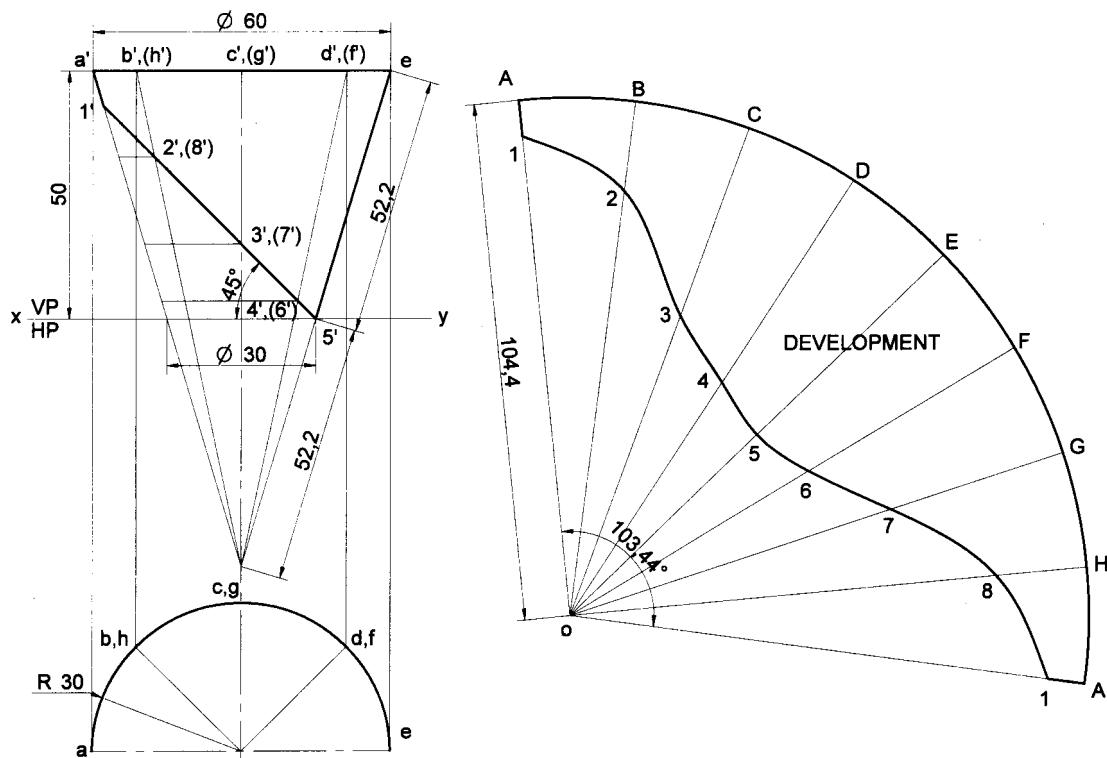
Problem 41 A right cone of 55mm diameter of base and 75mm height stands on its base on HP. It is cut to the shape of a truncated cone with its truncated surface inclined at 45° to the axis lying at a distance of 40mm from the apex of the cone. Obtain the development of the lateral surface of the truncated cone.

Solution



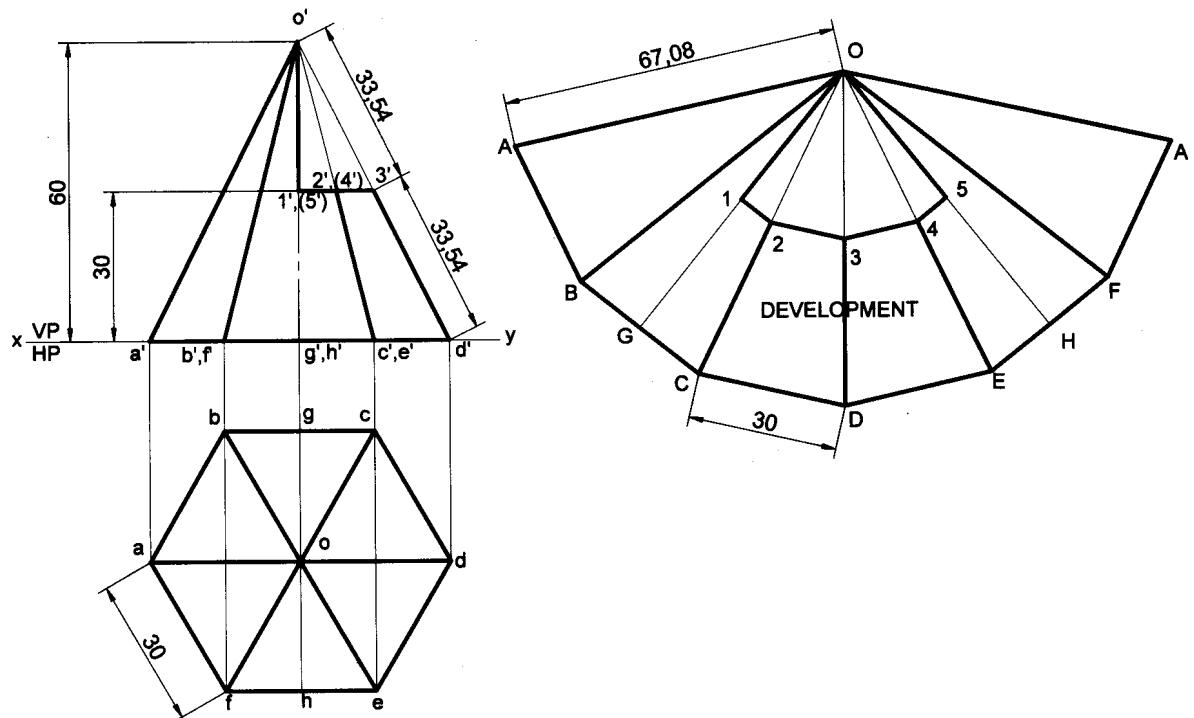
Problem 42 Draw the development of the following truncated cone.

Solution



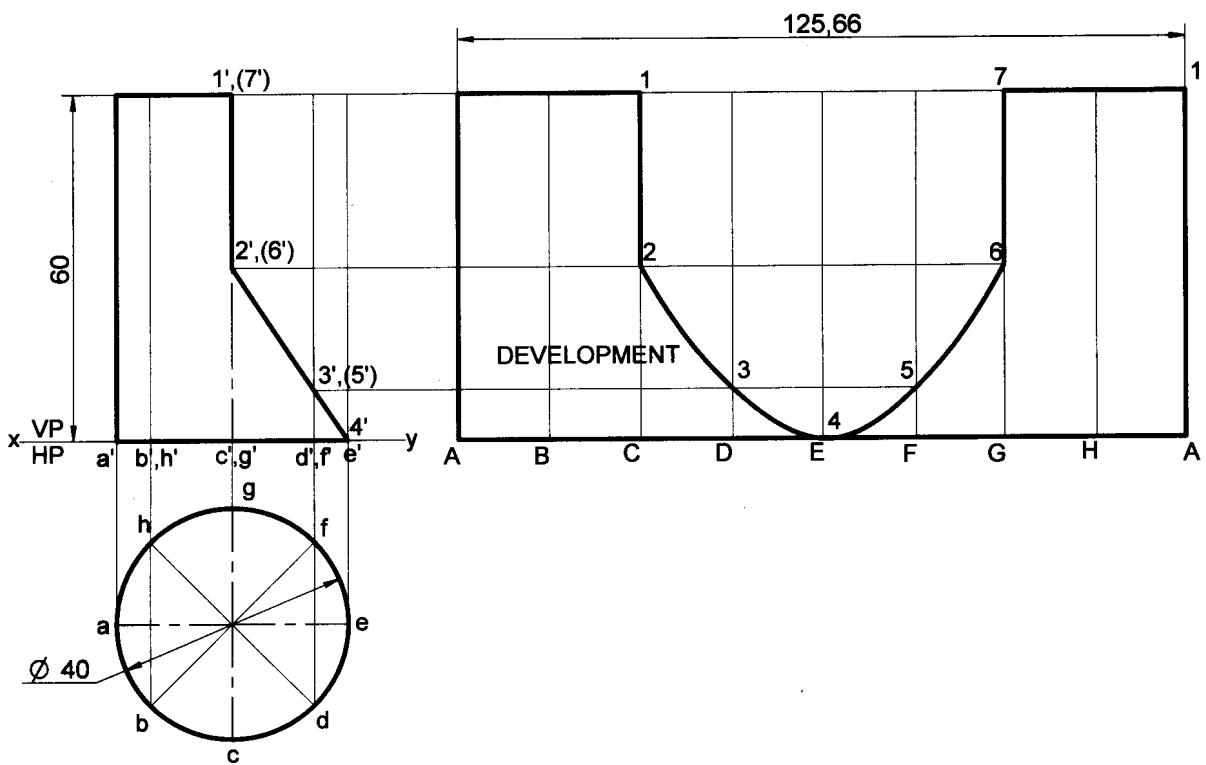
Problem 43 A hexagonal pyramid of 30mm sides of base with a side of base parallel to VP. Draw the development of the lateral surfaces of the retained portion of the pyramid which is shown by dark lines in the following figure.

Solution



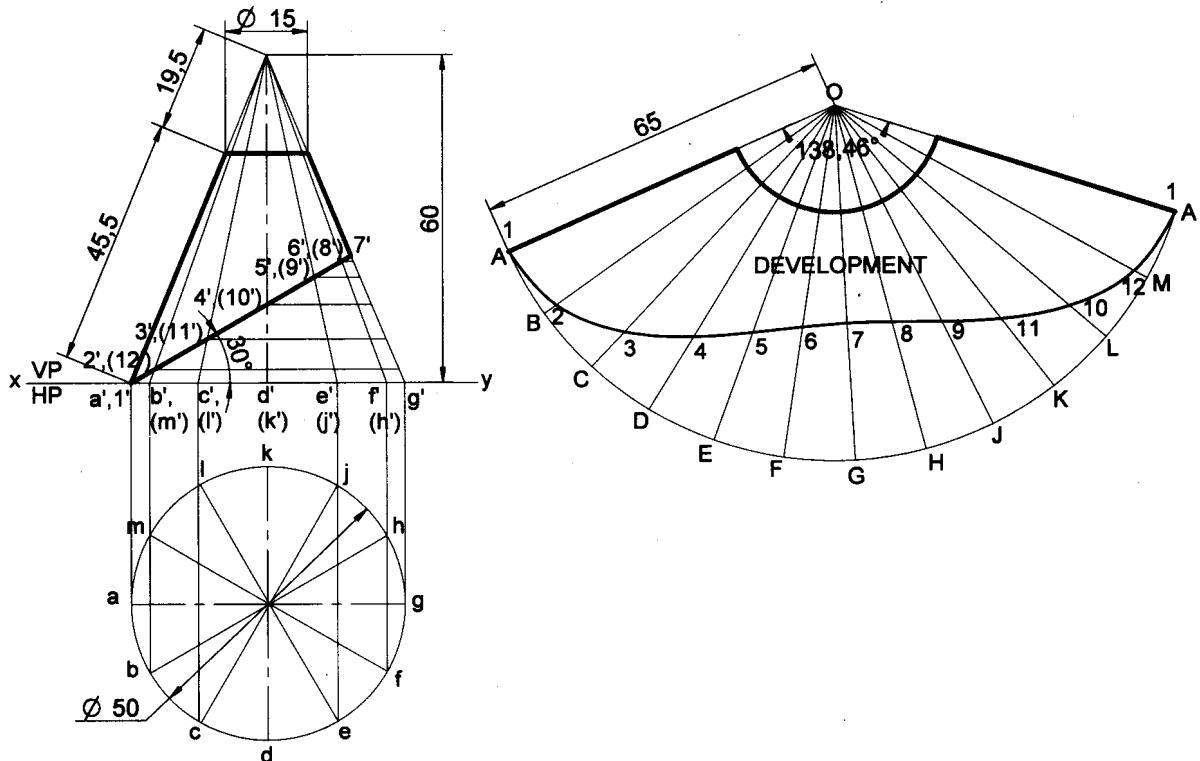
Problem 44 Develop the lateral surface of the cylinder of 40mm diameter and height 60mm which is cut in the following way.

Solution



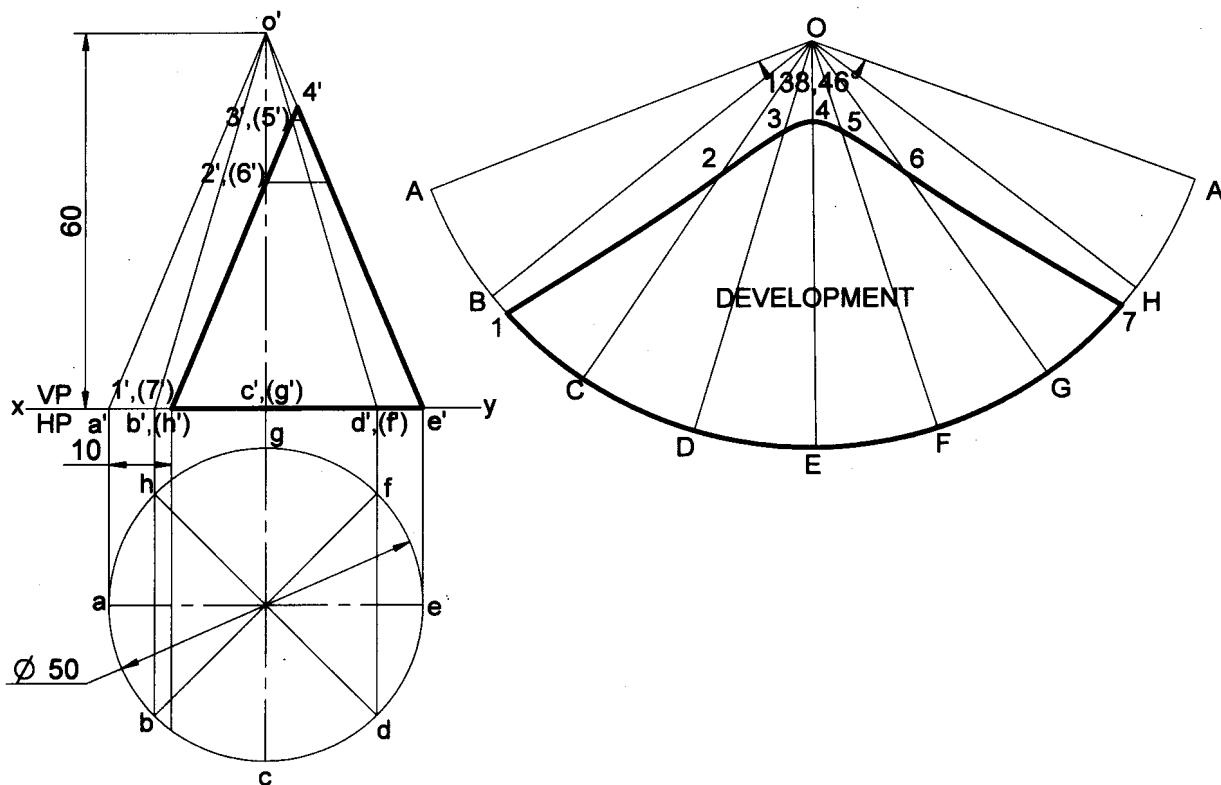
Problem 45 Draw the development of the lateral surface of the cone, whose front view is as shown in the following figure.

Solution



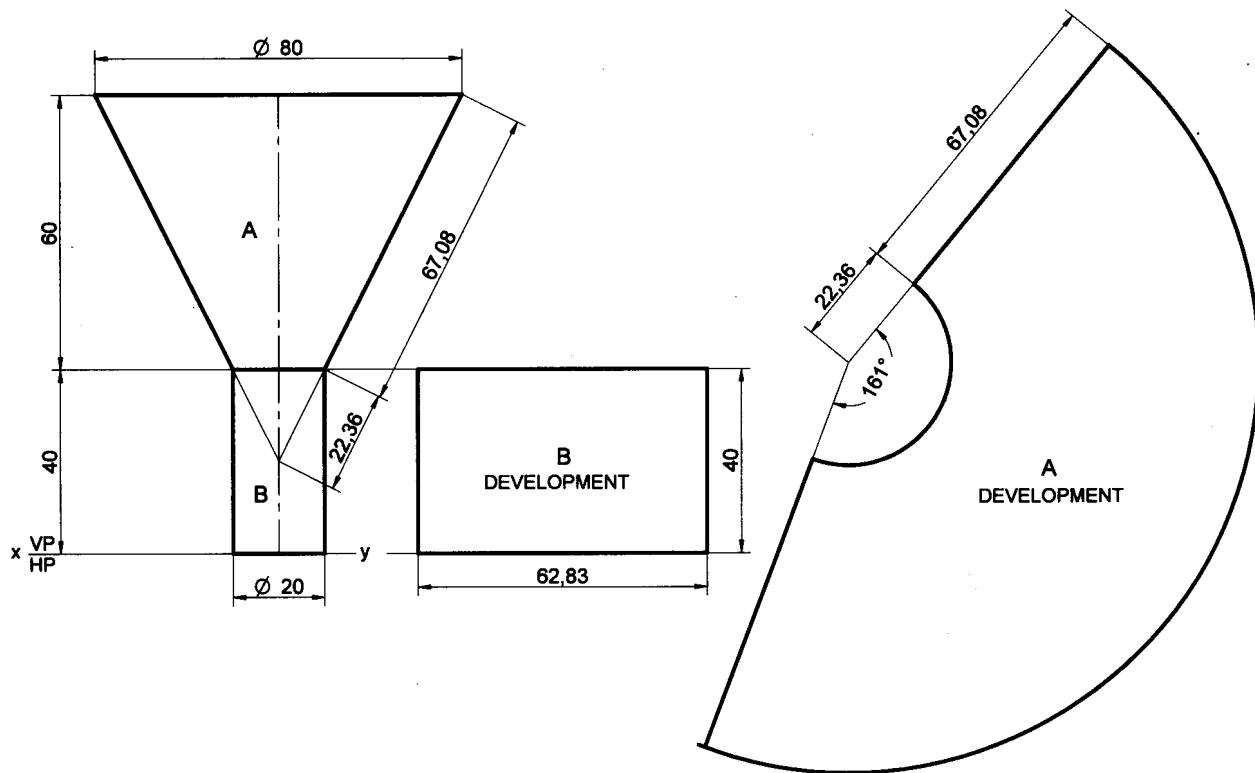
Problem 46 A cone of base diameter 50mm and height 60mm is resting with its base on HP. It is cut, as shown in the following front view of which is as shown in figure. Draw the development of the lateral surface of it.

Solution



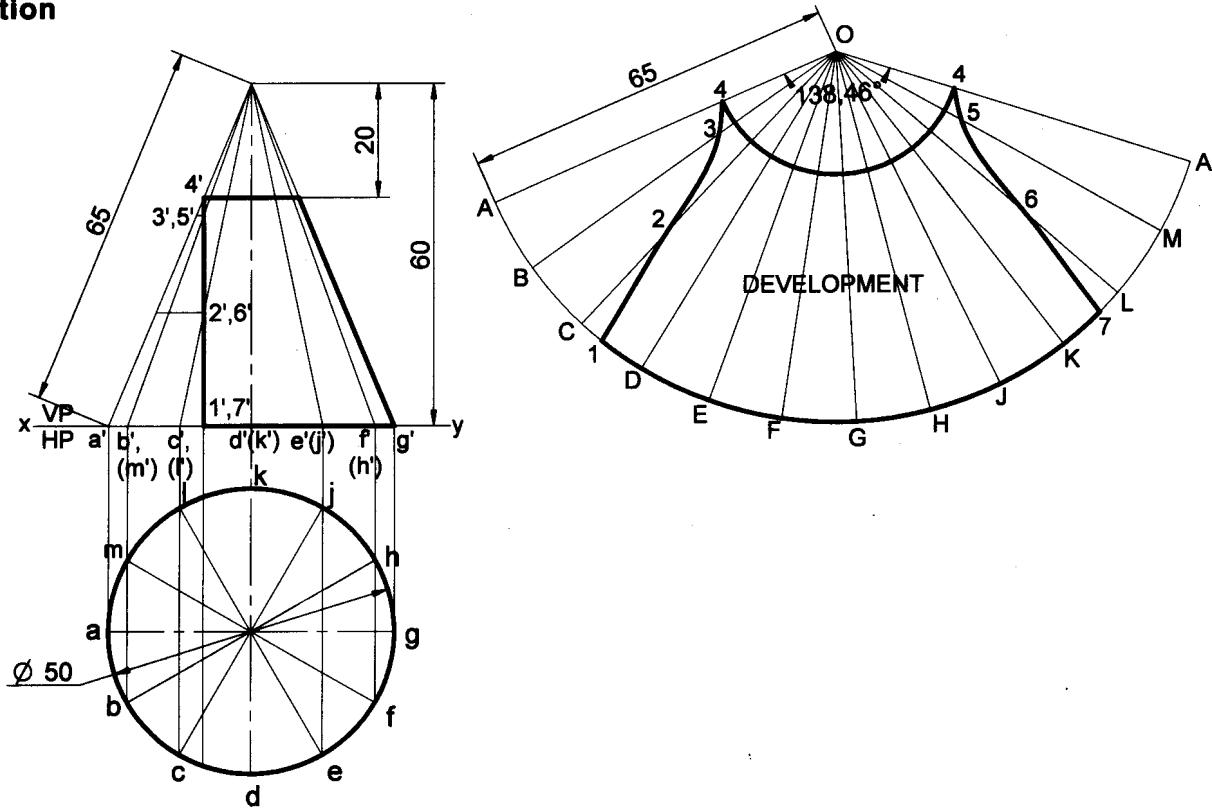
Problem 47 Draw the development of the lateral surface of a funnel consisting of a cylinder and a frustum of a cone. The diameter of the cylinder is 20mm and top face diameter of the funnel is 80mm. The height of frustum and cylinder are equal to 60mm and 40mm respectively.

Solution



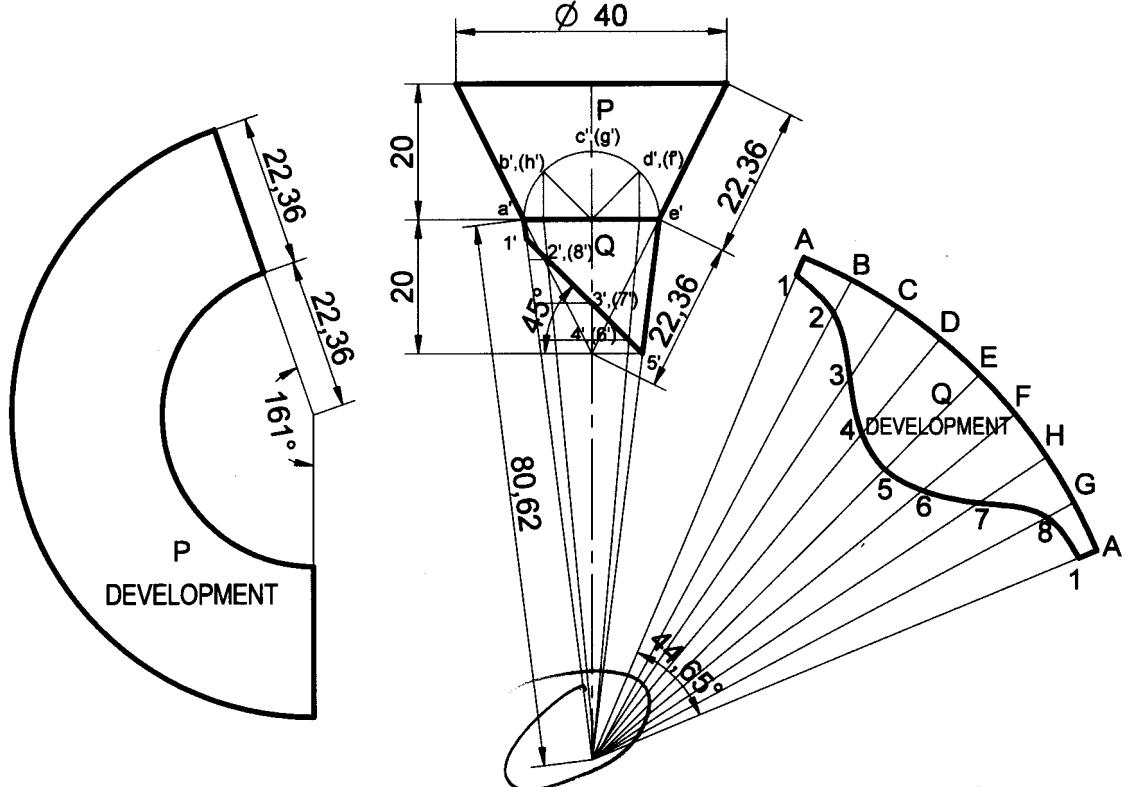
Problem 48 Draw the development of the lateral surface of the cut cone, whose front view is shown in the following figure.

Solution



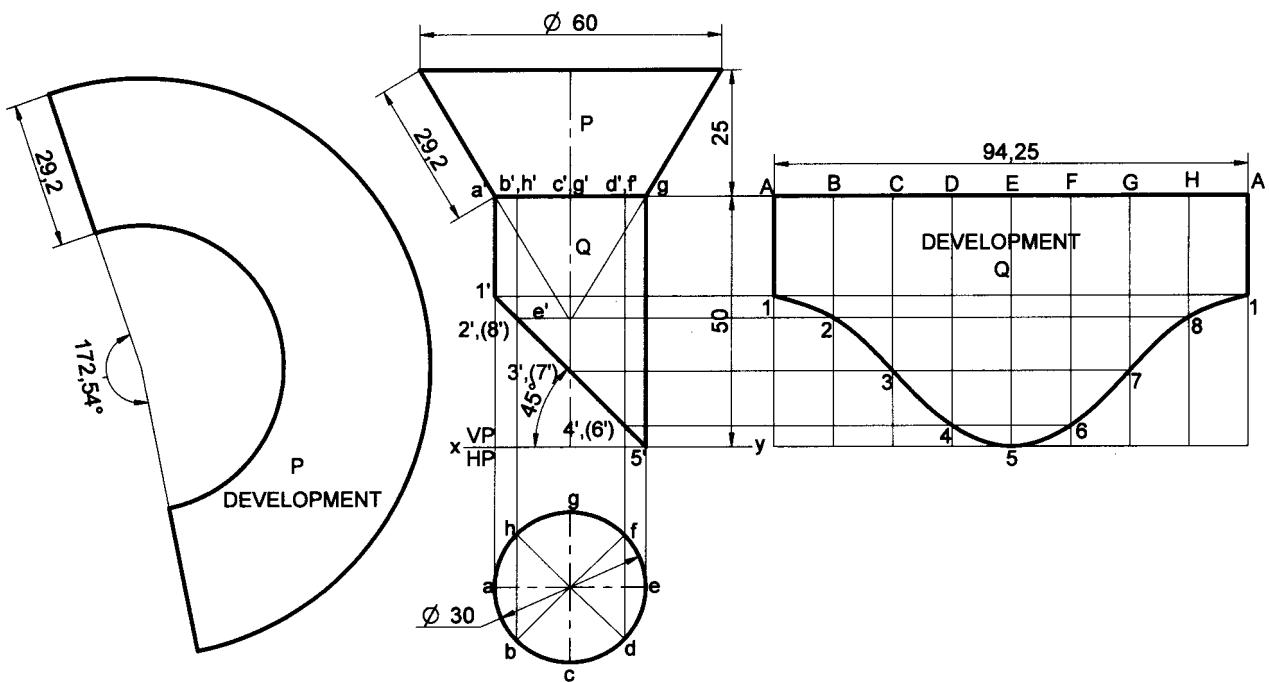
Problem 49 A funnel is to be made of sheet metal. The funnel tapers from 40 mm to 20 mm diameter to a height of 20 mm and from 20 mm to 15 mm diameter, for the next 20 mm height. The bottom of the funnel is beveled off to a plane inclined at 45° to the axis. Draw the development of the funnel.

Solution



Problem 50 A funnel is made of sheet metal. The funnel tapers from 60 mm. to 30 mm. diameters to a height of 25 mm. and then forms to a cylinder with a height of 50 mm. Bottom of funnel is beveled off completely at an angle of 45° to axis Draw the development of funnel.

Solution



Unit I (MECL28)

Introduction:

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D environment. Commands and creation of Lines, coordinate points, axes, polylines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet and curves.

Orthographic Projections of Points, Lines and Planes:

Orthographic projections: Definitions - Planes of projection, reference line and conventions employed, Projections of points in First and Third quadrants (**No problems**), Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes (**No problems**).

Orthographic Projections of Planes viz triangle, square, rectangle, pentagon, hexagon, and circular laminae (**Placed in First quadrant only using change of position method**).

Unit II

Development of Lateral Surfaces of Solids:

Development of sectioned (Section plane perpendicular to VP and inclined to HP bisecting the axis only) lateral surfaces of right regular prism, cylinder, pyramid and cone resting with base on HP only.

- Pedagogy/Course delivery tools: Chalk and talk, Power point presentation
- Links: Development of lateral surfaces: https://www.youtube.com/watch?v=U5mz9_W-xdl

Unit III

Orthographic Projection of Solids:

Orthographic projection of right regular solids (Solids Resting on HP only): Prism & Pyramid (triangle, square, rectangle, pentagon, hexagon), Cylinder, Cone and Cube (No freely suspended problems).

- Pedagogy/Course delivery tools: Chalk and talk, Power point presentation
- Links: Orthographic Projection of Solids: <https://youtu.be/-sUEGrynfJ0>

Unit IV

Isometric Projections:

Isometric scale, Isometric projection of hexahedron (cube), right regular prism, pyramid, cylinder, cone, sphere and frustum of solid. Isometric projection of combination of two simple solids (Co-axial only).

- Pedagogy/Course delivery tools: Chalk and talk, Power point presentation
- Links: Isometric Projection: <https://youtu.be/Vo9LC9d7FQA>

My grade in CAED: O grade / S grade

Appreciate my work? Buy me a rope:
<https://koncarne.bandcamp.com/>

Thanks :>