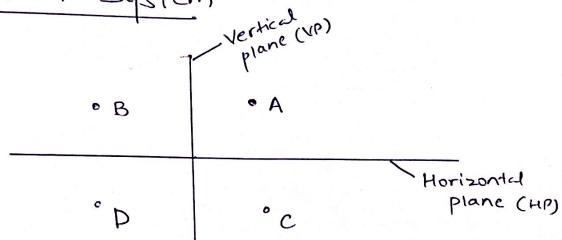


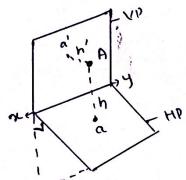
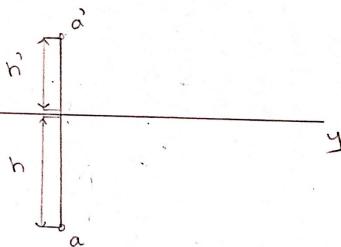
3rd August, 2023

Quadrant System



- A: Infront of VP, above the HP
- B: Behind the VP, above the HP
- C: Infront of VP, below the HP
- D: Behind the VP, below the HP

For a point 'A' in the first quadrant, the representation is as follows.

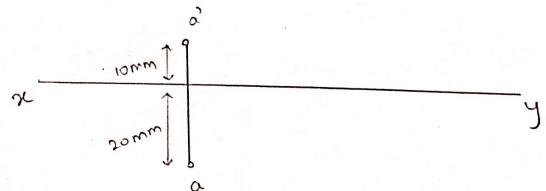


We rotate the HP clockwise by 90° .
Hence the top view of point A is obtained below the XY line.

Q. Draw the projection of point A which is 10mm above the HP & 20mm in front of the VP.

Ans: Given data:

'a'' is 10mm above the XY line
'a'' is 20mm below the XY line



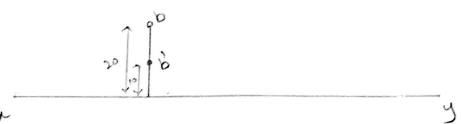
If the point 'B' lies in the second quadrant, we follow the same principle of rotating the horizontal plane clockwise. This time the points a' & a both lie above the $x-y$ line.

Q. Draw the projection of a point 'B' which is 10mm above the HP & 20mm behind the VP.

A. Given data:

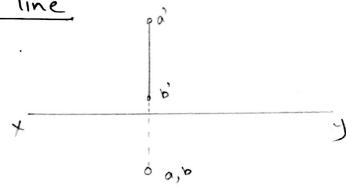
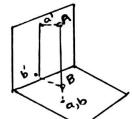
b' is 10mm above the $x-y$ line \rightarrow

b is 20mm above the $x-y$ line

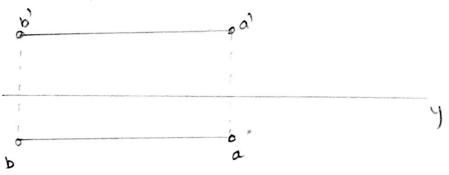
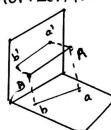


Projection of a line

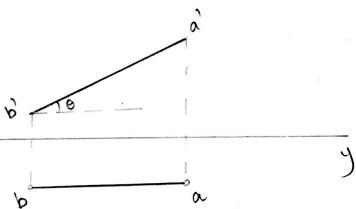
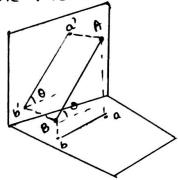
i) Vertical line:



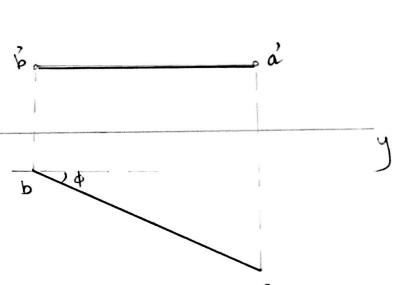
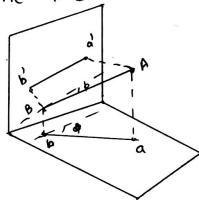
ii) Horizontal line:



iii) Line inclined to HP:



iv) Line inclined to VP:



Description

- i) Actual Line
- ii) Front View
- iii) Top View
- iv) Side View
- v) Line assumed \parallel to VP
- vi) Corresponding true length of AB_1
- vii) Corresponding plan length of AB_1
- viii) Line assumed \parallel to HP
- ix) Corresponding true length of AB_2
- x) Corresponding elevation length of AB_2
- xi) True inclination with HP
- xii) True inclination with VP
- xiii) Apparent inclination of $a'b'$ with xy line
- xiv) Apparent inclination of ab with xy line

Notation

- i) AB
- ii) $a'b'$
- iii) ab
- iv) $a''b''$
- v) AB_1
- vi) $a'b'_1$
- vii) ab_1
- viii) AB_2
- ix) ab_2
- x) $a'b'_2$
- xi) θ
- xii) ϕ
- xiii) α
- xiv) β

Q-A line AB 70mm long is inclined at an angle of 30° to the HP & 45° to the VP. Its end-point A is 10mm above the HP & 20mm in front of the VP. Draw the projection of line AB assuming it's in the first quadrant.

Ans: Given data;

$$\rightarrow TL = 70\text{mm}$$

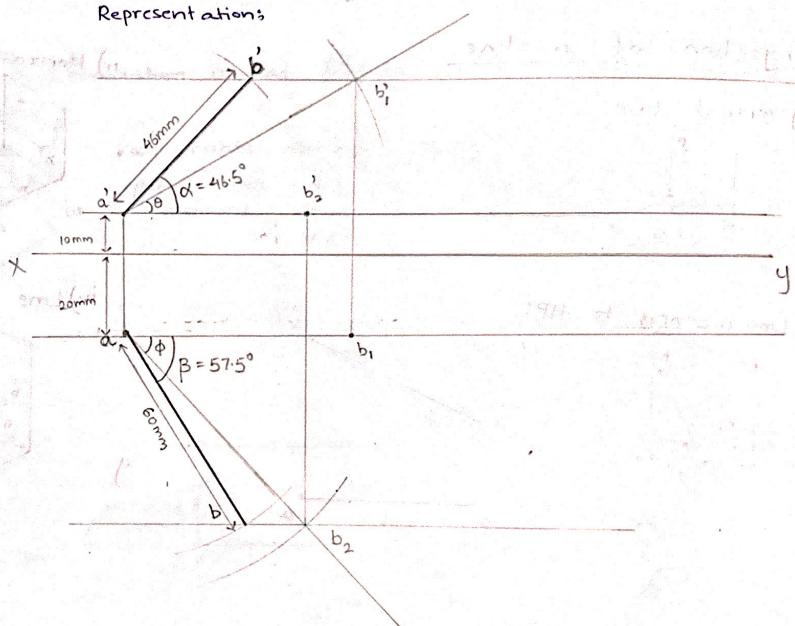
$$\rightarrow a' = 10\text{mm} \text{ above } xy \text{ line}$$

$$\rightarrow a = 20\text{mm} \text{ below } xy \text{ line}$$

$$\rightarrow \theta = 30^\circ$$

$$\rightarrow \phi = 45^\circ$$

Representations;

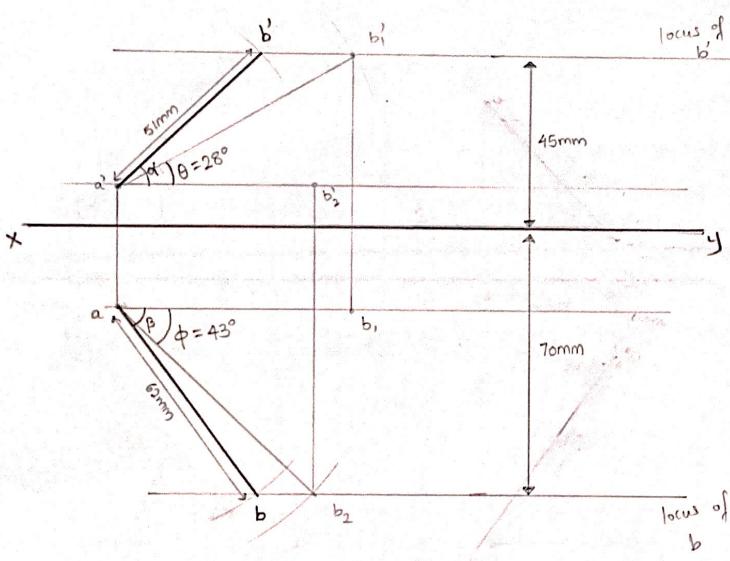


10th August, 2023

Q. A line AB 70mm long has its end A 10mm above the HP & 20mm in front of the VP. The end B is 45mm above the TP & 70mm in front of the VP. Draw the projection of the line AB & find its inclination with the reference planes.

Ans: Given data:

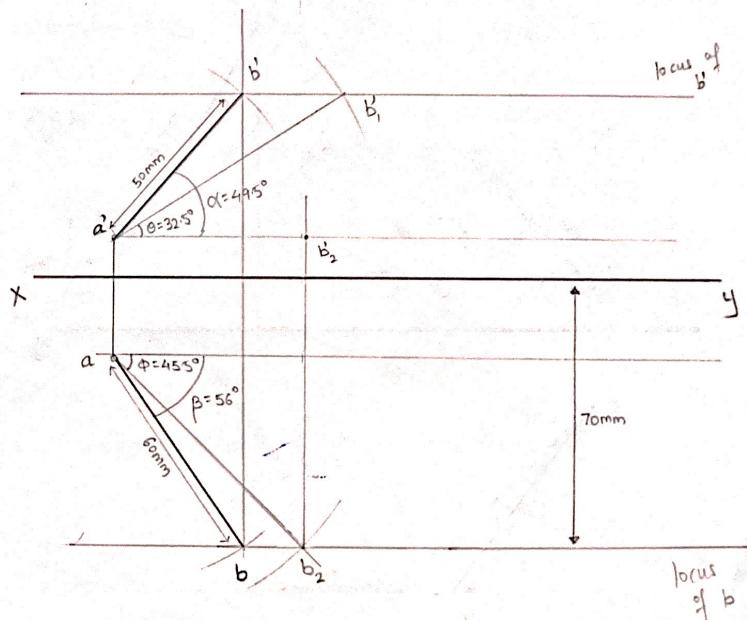
- TL = 70mm
- a' is 10mm above xy line → b' is 45mm above xy line
- a is 20mm below xy line → b is 70mm below xy line



Q. Top view of a line AB \perp 70mm long measures 60mm. The end-point A is 10mm above HP & 20mm in front of VP. The other end-point B is 70mm in front of VP & above the TP.

Ans: Given data:

- $TL = 70\text{mm}$ → $a' = 10\text{mm}$ above xy line
- $ab_1 = 60\text{mm} = ab$ → $a = 20\text{mm}$ below xy line
- locus of $b = 70\text{mm}$ below the xy line



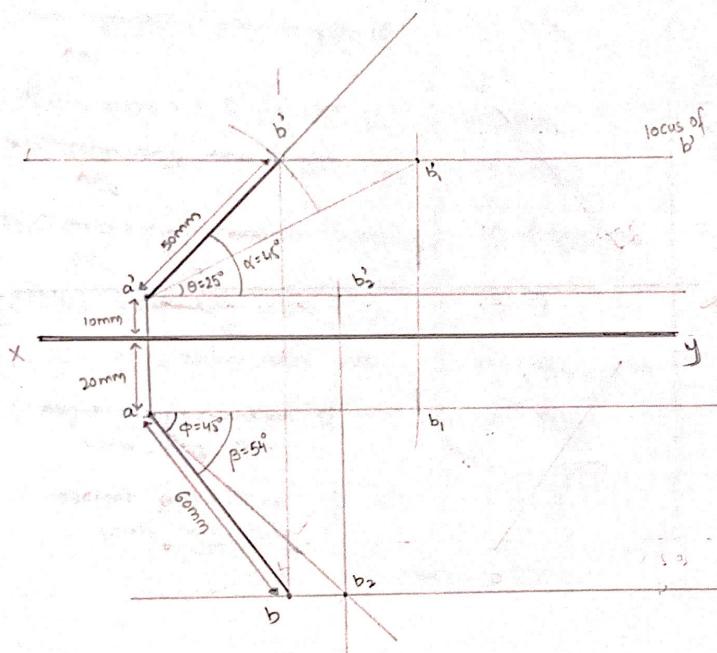
Q. The front view of line AB measures 50mm & makes an angle of 45° with the x-y line. The point A is 10mm above the HP & 20mm in front of the VP. Draw its projection if it's inclined at 45° with the VP.

Ans: Given Data:

$$\rightarrow a'b' = 50\text{mm} = a'b_2' \quad \rightarrow \alpha = 45^\circ$$

$$\rightarrow a' \text{ is } 10\text{mm} \text{ above the } x-y \text{ line} \quad \rightarrow \phi = 45^\circ$$

$$\rightarrow a \text{ is } 20\text{mm} \text{ below the } x-y \text{ line}$$



Q. The distance between the end projection in line AB is 35mm. The line AB is 70mm long & inclined at 30° to the HP. The end point A is 10mm above the HP & 20mm in front of the VP. Draw the projection of the line AB.

Ans: Given data:

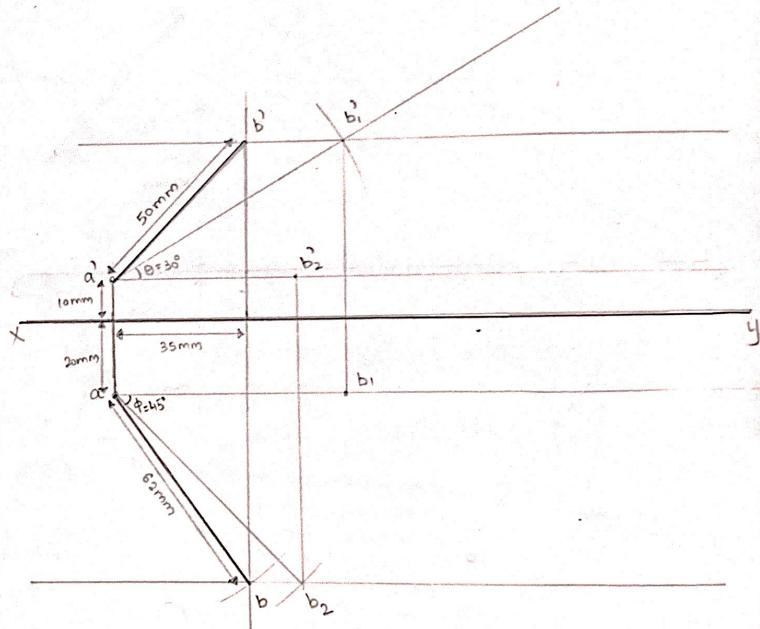
$$\rightarrow a' \text{ is } 10\text{mm} \text{ above the } x-y \text{ line}$$

$$\rightarrow a \text{ is } 20\text{mm} \text{ below the } x-y \text{ line}$$

$$\rightarrow TL = 70\text{mm} \quad (a'b'_1 = ab_2)$$

$$\rightarrow \theta = 30^\circ$$

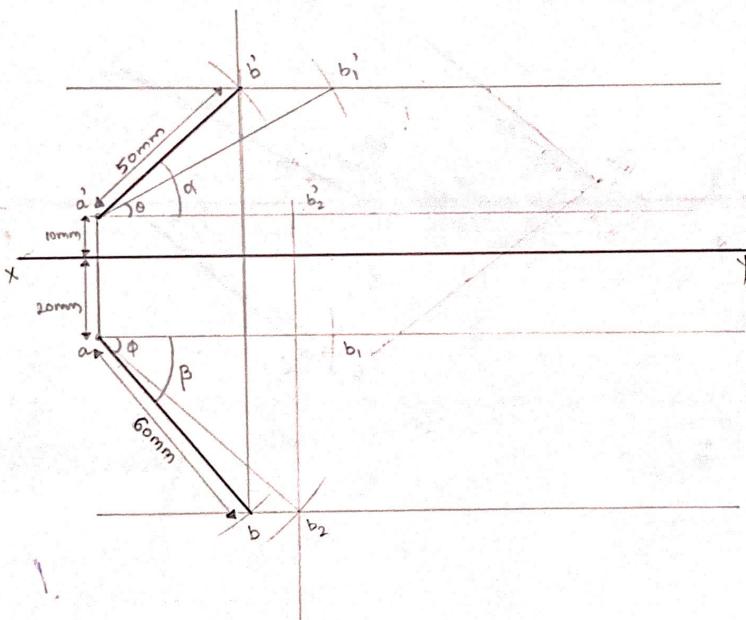
$$\rightarrow a'b' \cdot \cos\phi = ab \cos\beta = 35\text{mm}$$



Q: The front view & top view measure 50mm & 60mm respectively. The line AB is 70mm long. Point A is 10mm above the H.P. & 20mm in front of the V.P. Draw the projection of line AB & determine its inclination with the reference planes.

Ans: Given data:
TL = 70mm ($a'b_1' = ab_2$)

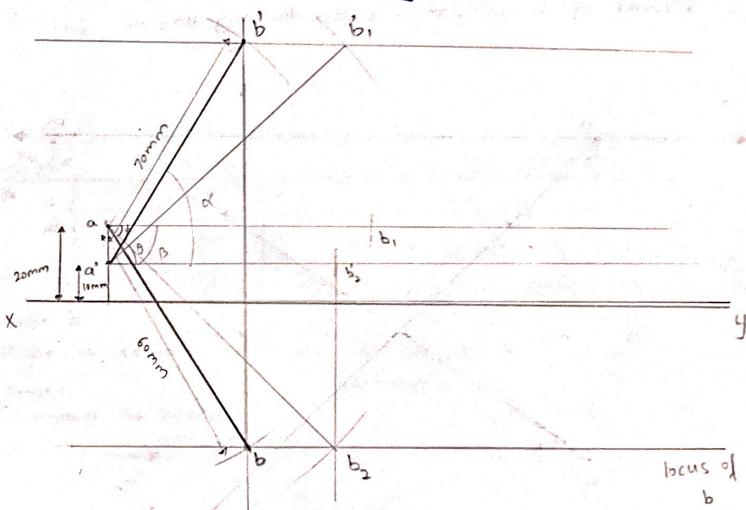
a' is 10mm above the x-y line
 a is 20mm below the x-y line
 $a'b_1' = 50mm = a'b_2$
 $ab = 60mm = ab_1$



Q: The front view of a 85mm long straight line AB measures 60mm while its top view measures 70mm. Draw its projection if its end A is 10mm above the H.P. & 20mm behind the V.P., while its other endpoint B is in the first quadrant. Also determine its inclination with the reference planes.

Ans: Given data:

→ TL = 85mm ($a'b_1' = ab_2$)
→ $a'b_1' = a'b_2 = 60mm$
→ $ab = ab_1 = 70mm$
→ a' is 10mm above the x-y line
→ a is 20mm above the x-y line

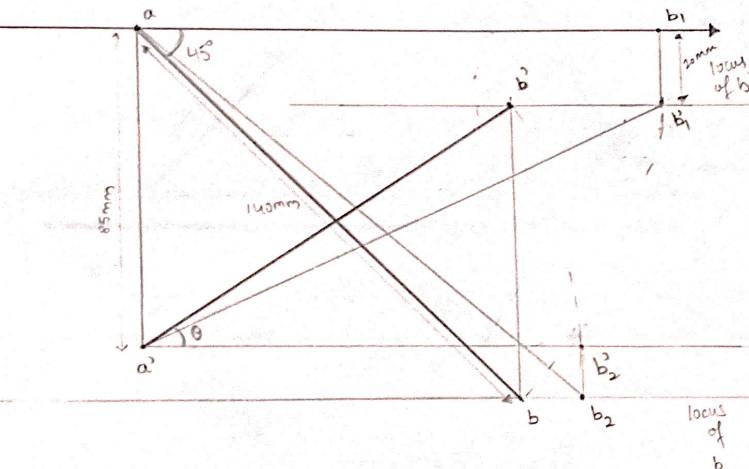


23/08/2023

Q. The plan ab of a straight line AB is 140mm long & it makes an angle of 45° with XY. The end A is in the VP & 85mm from the HP. The end B is 20mm from the HP & the whole line is in the fourth quadrant. Draw the projections, determine its true length & inclination.

Ans: Given data:

- $ab = ab_1 = 140\text{mm}$
- a' is 85mm below the XY line
- a is on the XY line
- Locus of b' is 20mm below the XY line

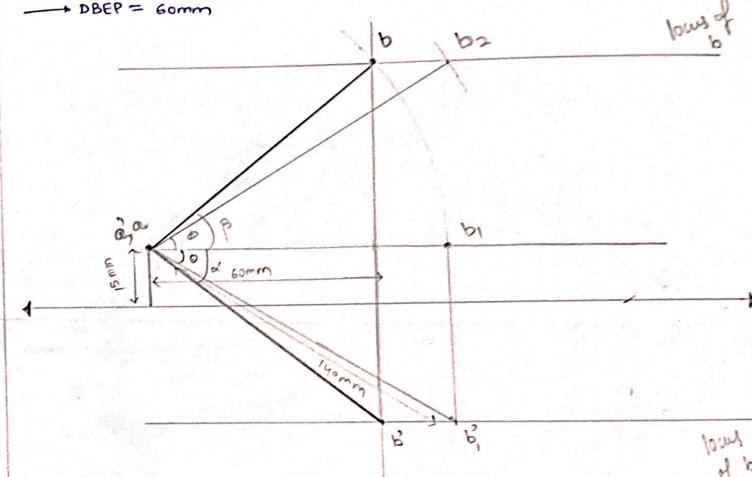


Q. The end A of a straight line AB 90mm long is in the second quadrant & 15mm from both the HP & the VP. End B is in the third quadrant. The line is inclined at 30° with the HP & the distance between the end-projectors measured parallel to the XY line is 60mm. Draw the projection of the line & find its inclination with the VP.

Ans: Given data:

- $a'b'_1 = ab_2 = 90\text{mm}$
- a' is 15mm above the XY line
- a is 15mm above the XY line
- DBEP = 60mm

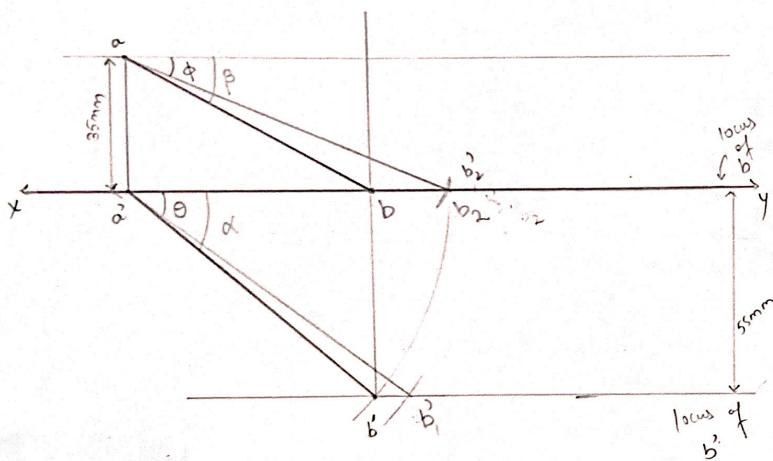
$$\rightarrow \theta = 30^\circ$$



Q. A line AB 90mm long has its one end A in the HP & 35mm behind the VP & the other end B in the VP & 55mm below the HP. Draw the projections of line & find its inclination with the reference planes.

Ans: Given data:

- $a'b_1 = ab_2 = 90\text{mm}$
- a' is on the XY line
- a is 35mm above the XY line
- b' is 55mm below the XY line
- b is on the XY line



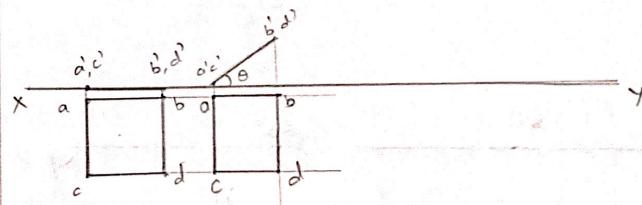
31/06/23

Projection of Planes

Case I: Plane is resting with its side on the VP.

Steps:

- i) Draw the top view. (Assuming plane is coincident with the HP)
- ii) Draw the corresponding front view on the XY line.
- iii) Draw a front view with given angle ' θ ' inclination from the HP.
- iv) Project the front view down & extend initial top view. The intersection points give the apparent top view.

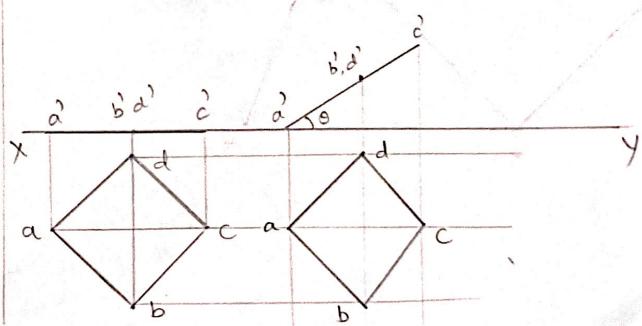


Case II:

Plane is resting with its corner point.

Steps:

'Identical to case I'



Q. A square lamina ABCD of side 50mm rests on the corner A in the H.P., such that the plane is seen as a rhombus in the top view with the diagonal contained by the corner A measuring 25mm. Draw its projection & determine the surface inclination with the H.P.

Ans3

