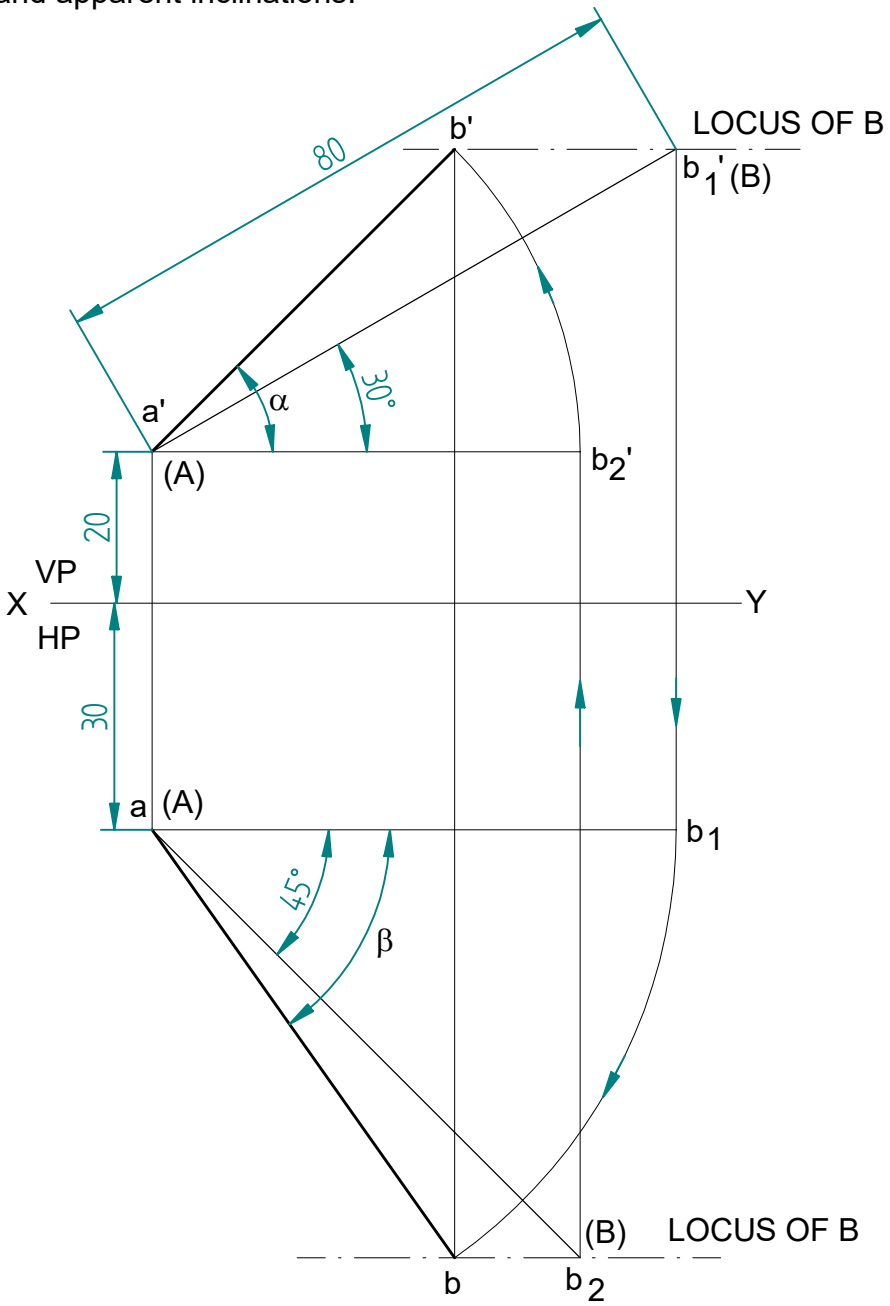
Projections of Lines

1. A line AB 80 mm long has its end A 20 mm above HP and 30 mm infront of VP. It is inclined at 30 deg. to HP and 45 deg. to VP. Draw the projections of the line and find apparent lengths and apparent inclinations.

Solution:

Data Given

- True Length = AB = 80mm is inclined at 30 deg. to HP and 45 deg. to VP
- End A 20 mm above HP and 30 mm infront of VP



ANSWERS

α = 45°
β = 54.74°
a'b' = 56.57 mm
ab = 69.28 mm

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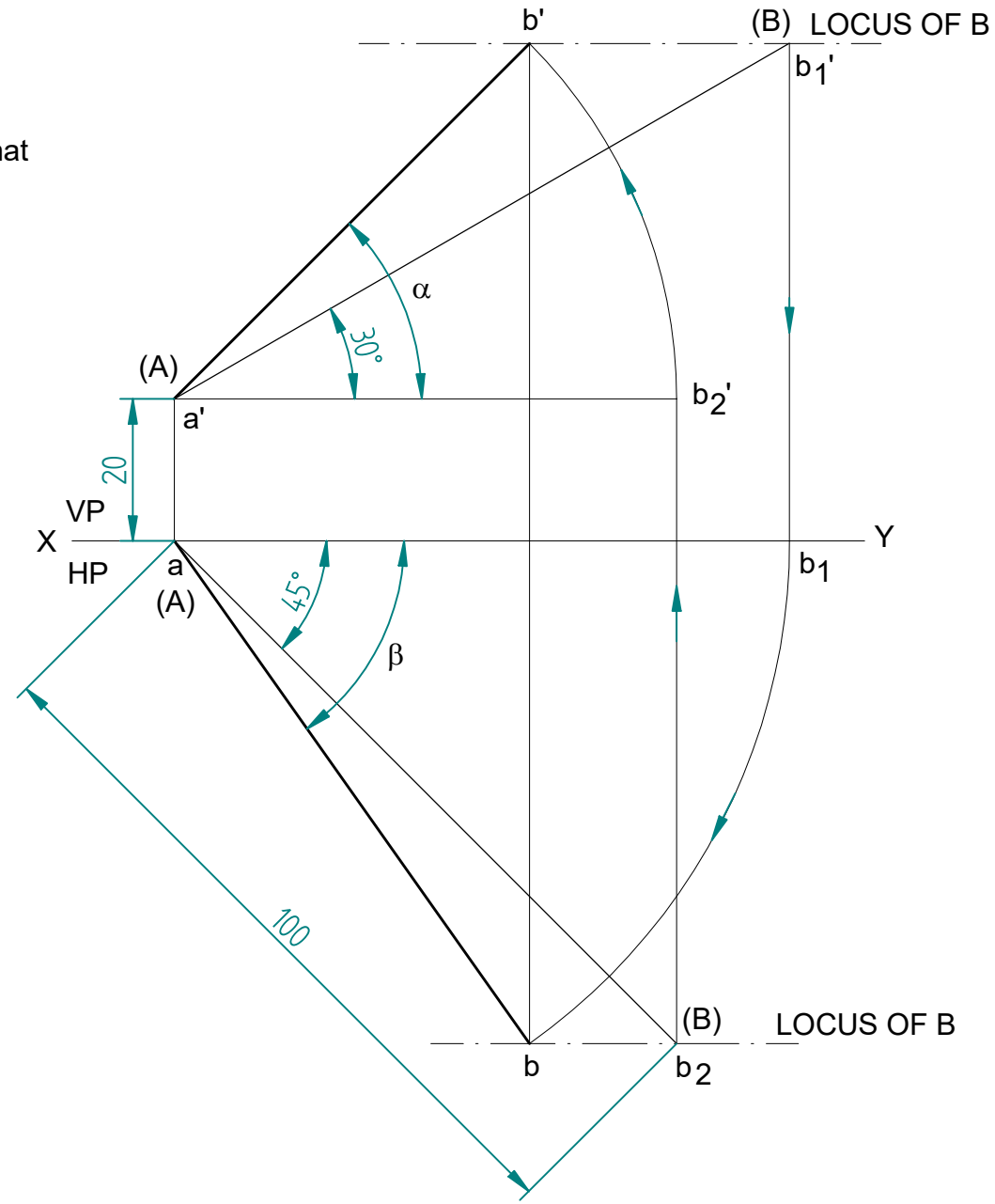
Projections of Lines

2. Draw the projections of a line AB 100 mm long inclined at 45 deg. to VP and 30 deg. to HP. One end of the line is 20 mm above HP and in VP. Determine apparent lengths and inclinations.

Solution:

Data Given

Problem Similar to Problem 1, except that one end of the line is in VP



ANSWERS

α = 45.00°
β = 54.74°
a'b' = 70.71 mm
ab = 86.60 mm

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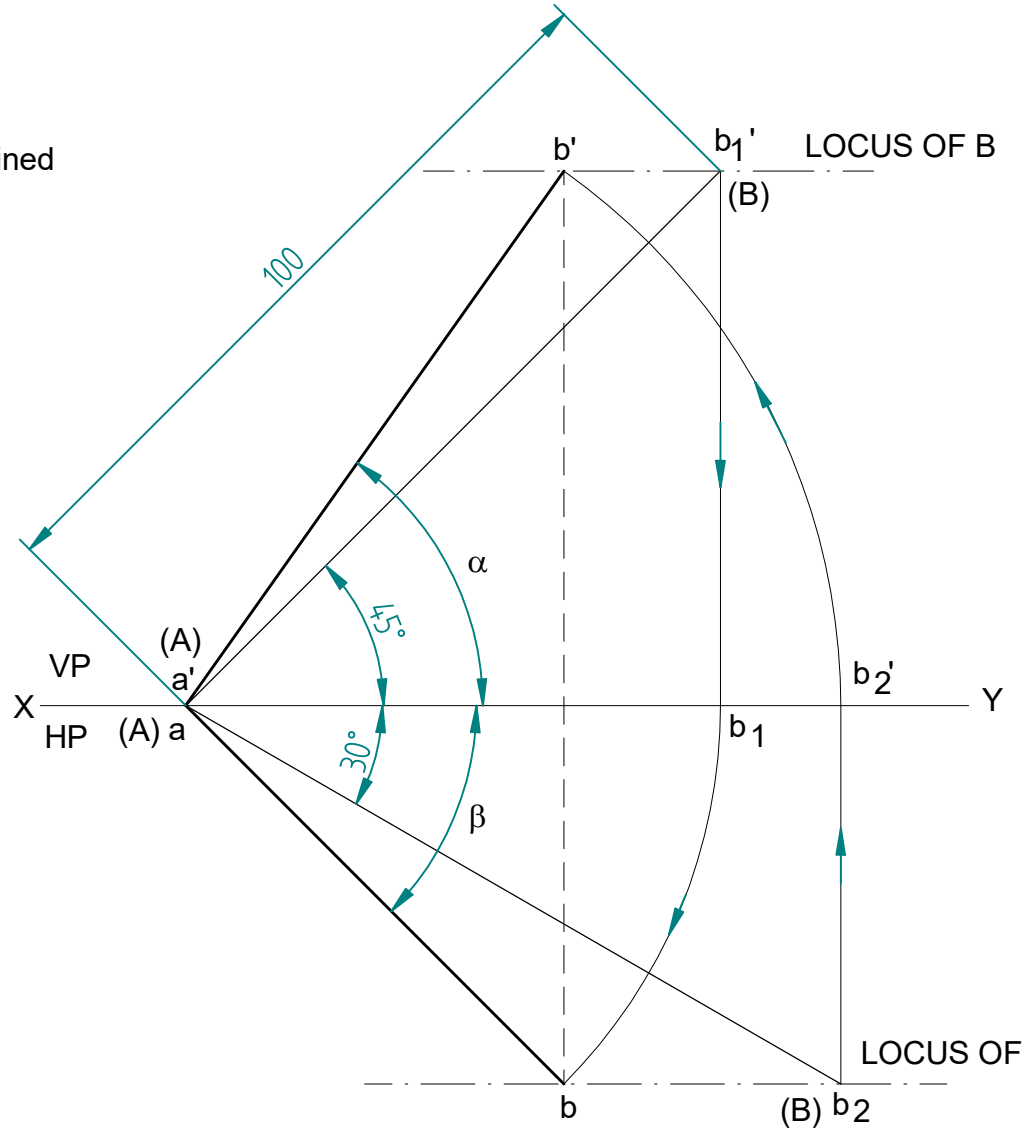
Projections of Lines

3. A line AB 100 mm long is inclined to HP at 45 deg. and inclined to VP at 30 deg. Draw front and top views of line and determine their lengths. Also determine the perpendicular distance of end B from both HP and VP.

Solution:

Data Given

- True Length = AB = 100mm is inclined at 45deg. to HP and 30deg. to VP



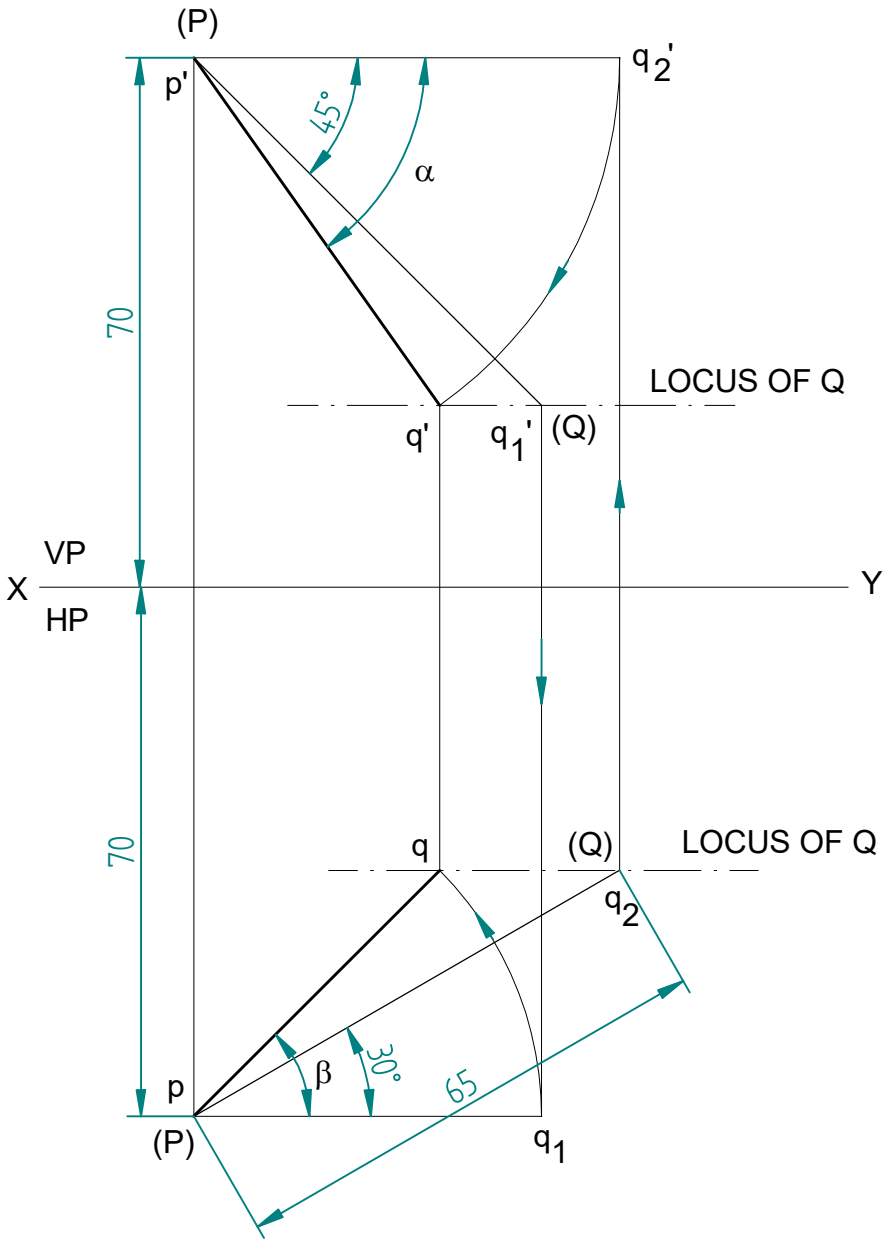
ANSWERS

α = 54.74°	
β = 45.00°	
a'b' = 86.60 mm	
ab = 70.71 mm	
Perpendicular distance of end B from HP	$b_1'b_1$ = 70.71 mm
Perpendicular distance of end B from VP	$b_2'b_2$ = 50.00 mm

Projections of Lines

4. A straight line PQ, 65 mm long, is inclined at 45 deg. to HP and 30 deg. to VP. The point P is 70 mm from both the reference planes and point Q is towards the reference planes. Draw the projections.

Solution:



ANSWERS

$\alpha = 54.74°$
$\beta = 45.00°$

5. A line AB measuring 70 mm has its end A 15 mm infront of VP and 20 mm above HP and the other end B 60 mm infront of VP and 50 mm above HP. Draw the projections of the line and find the inclinations of the line with the both the reference planes of projection.

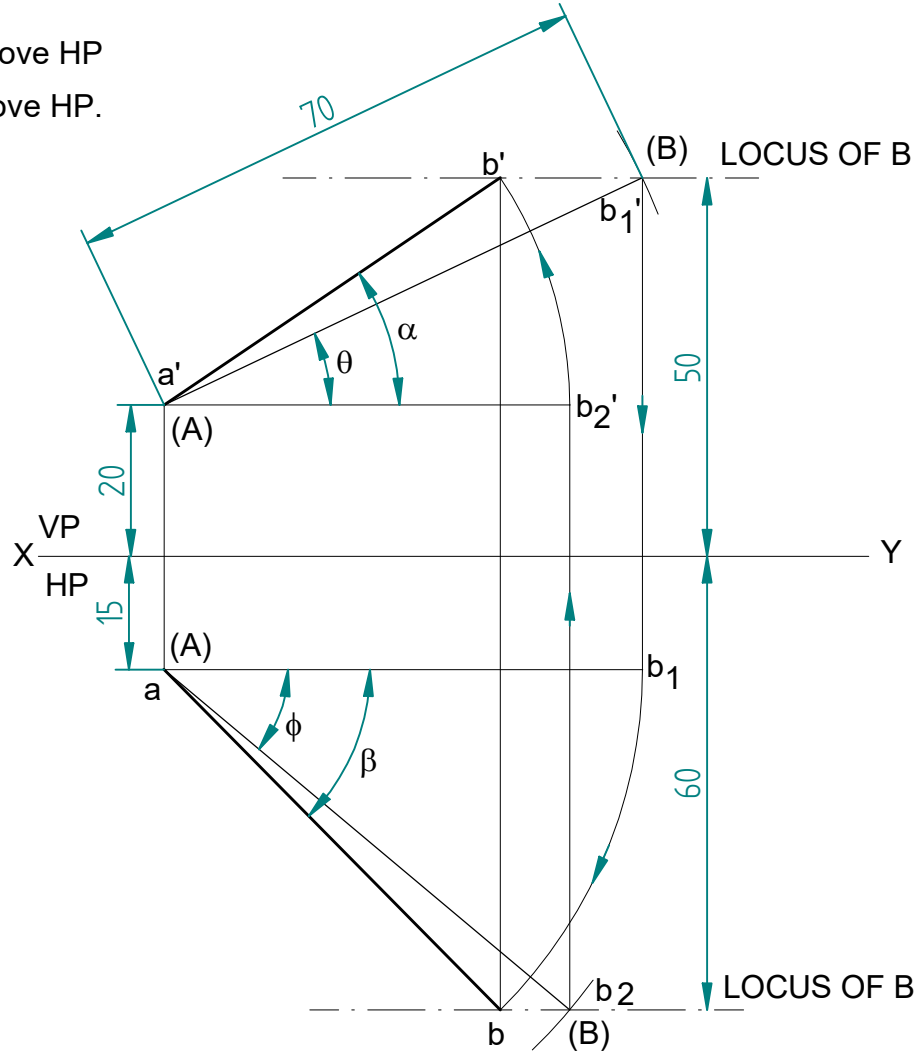
Solution:

Data Given

True Length = AB = 70 mm

End A 15 mm infront of VP and 20 mm above HP

End B 60 mm infront of VP and 50 mm above HP.



ANSWERS

α = 34.02°
θ = 25.38°
ϕ = 40.01°
β = 45.36°

6. A line AB 65 mm long, has its end A 20 mm above HP and 25 mm infront of VP. The end B is 40 mm above HP and 65 mm infront of VP. Draw the projections of AB and show its inclination with HP and VP.

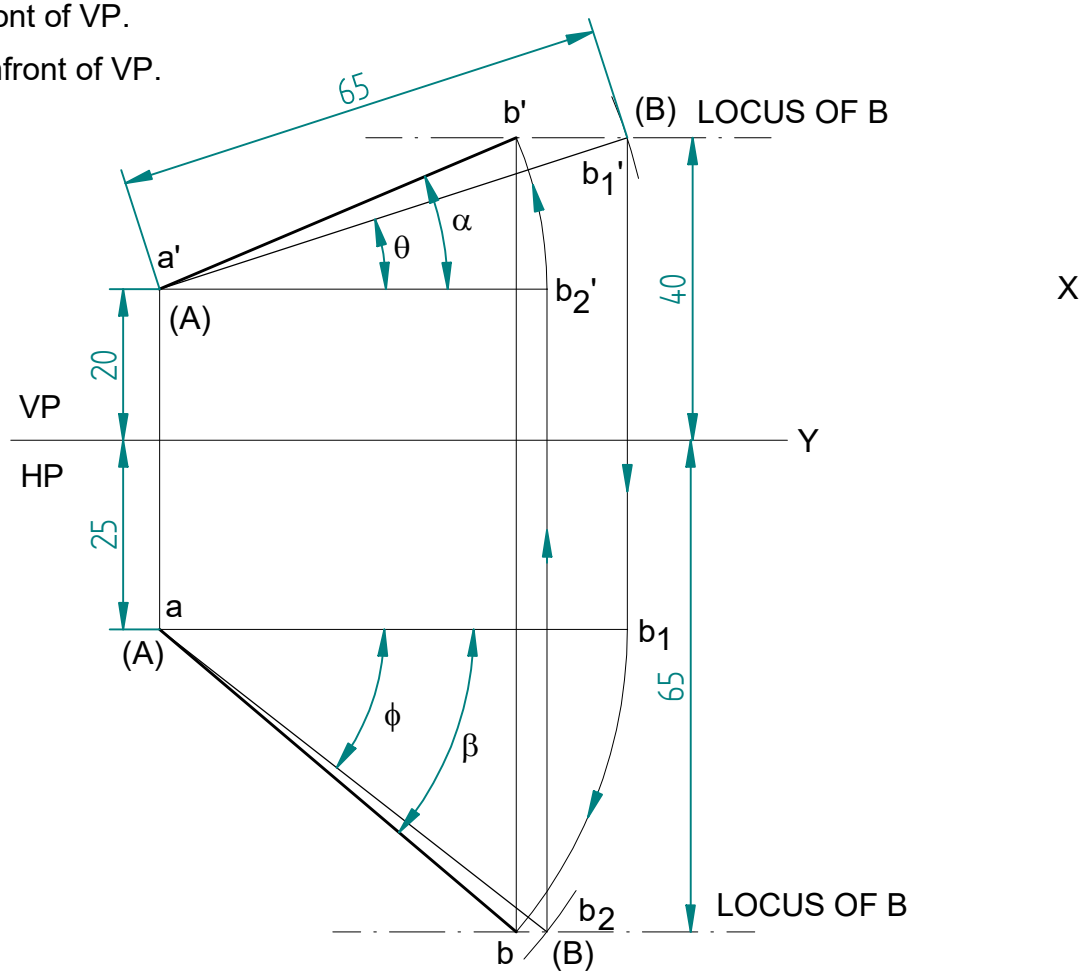
Solution:

Data Given

True Length = AB 65 mm

End A 20 mm above HP and 25 mm infront of VP.

End B is 40 mm above HP and 65 mm infront of VP.



ANSWERS

$\alpha = 22.98°$
$\theta = 17.92°$
$\phi = 37.98°$
$\beta = 40.30°$

7. A line AB has its end A 20 mm above HP and 30 mm infront of VP. The other end B is 60 mm above HP and 45 mm infront of VP. The distance between end projectors is 70 mm. Draw its projections. Determine the true length and apparent inclinations.

Solution:

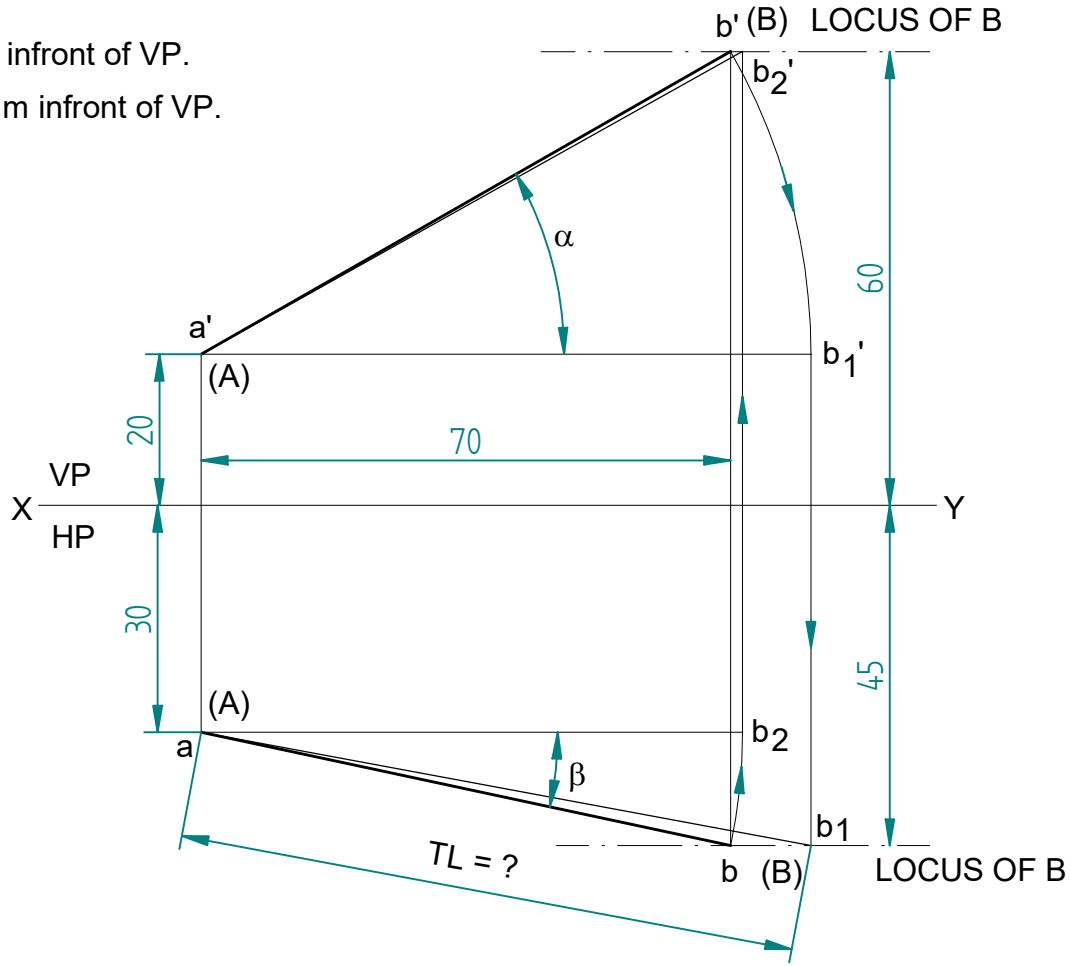
Data Given

Line AB

End A 20 mm above HP and 30 mm infront of VP.

End B is 60 mm above HP and 45 mm infront of VP.

DBEP = 70 mm.



ANSWERS

TL = 82.01 mm

α = 29.74°

β = 12.09°

Projections of Lines

8. The end A of a line AB is on HP and 25 mm infront of VP. The end B is on VP and 50 mm above HP. The distance between the end projectors when measured parallel to the line of intersection of HP and VP is 65 mm. Draw the projections of the line AB and determine its true length and true inclinations with HP and VP.

Solution:

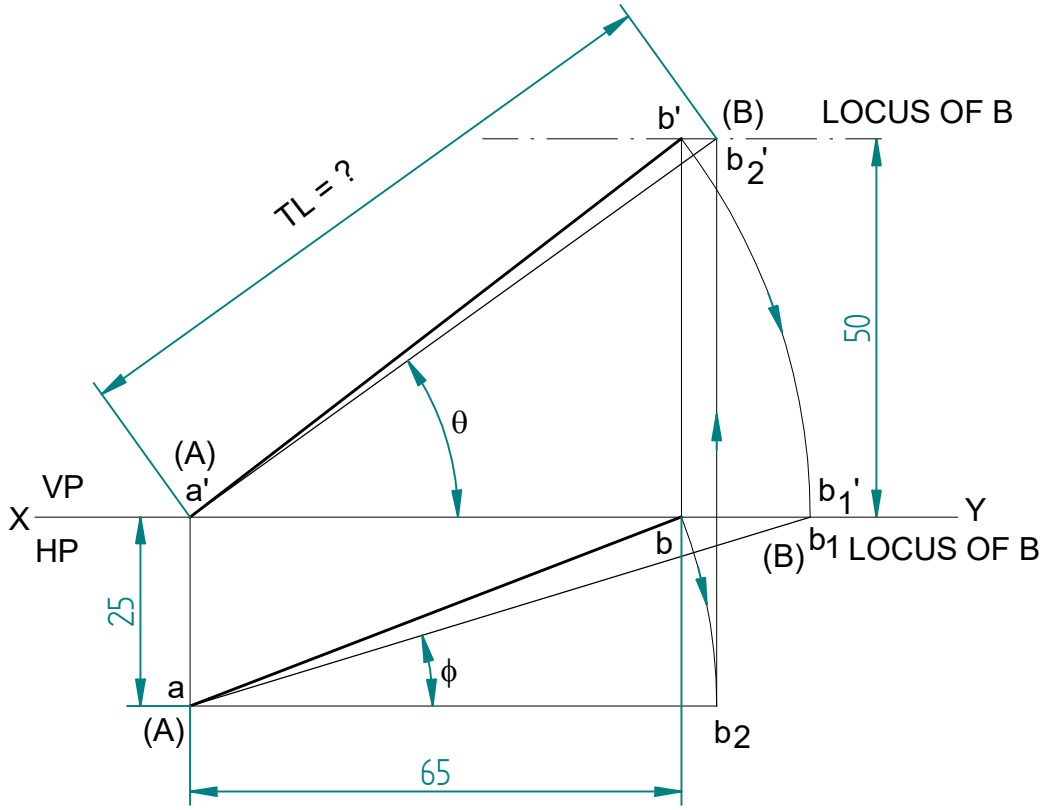
Data Given

Line AB

End A of a line AB is on HP and 25 mm infront of VP.

End B is on VP and 50 mm above HP.

DBEP = 65 mm



ANSWERS

θ = 35.68°

ϕ = 16.95°

TL = 85.73mm

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9. The end A of a line AB is in HP and 25 mm infront of VP. The end B is 10 mm infront of VP and 50 mm above HP. The distance between the end projectors when measured parallel to the line of intersection of HP and VP is 80 mm. Draw the projections of the line AB and determine its true length and true inclinations with HP and VP.

Solution:

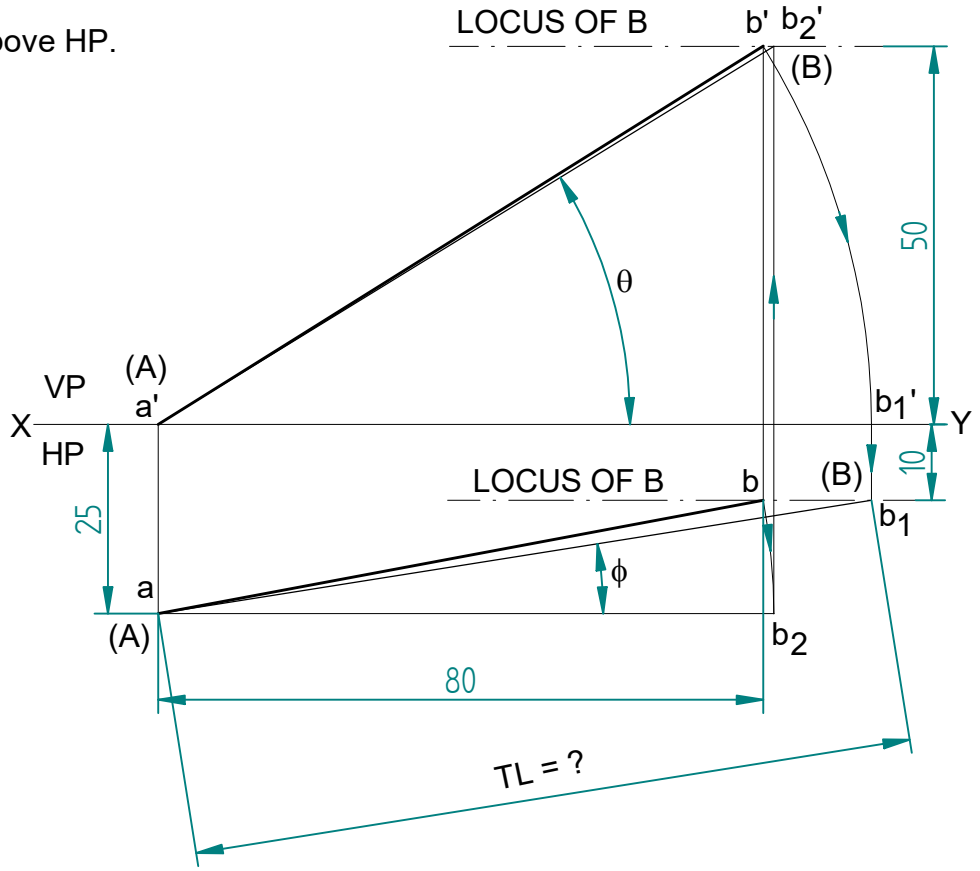
Data Given

Line AB

End A is in HP and 25 mm infront of VP.

End B is 10 mm infront of VP and 50 mm above HP.

DBEP 80 mm



ANSWERS

TL = 95.52mm

θ = 31.56°

ϕ = 9.03°

10. A line PQ 85 mm long has its end P 10 mm above HP and 15 mm infront of VP. The top view and front view of line PQ are 75 mm and 80 mm respectively. Draw its projections. Also determine the true and apparent inclinations of the line.

Solution:

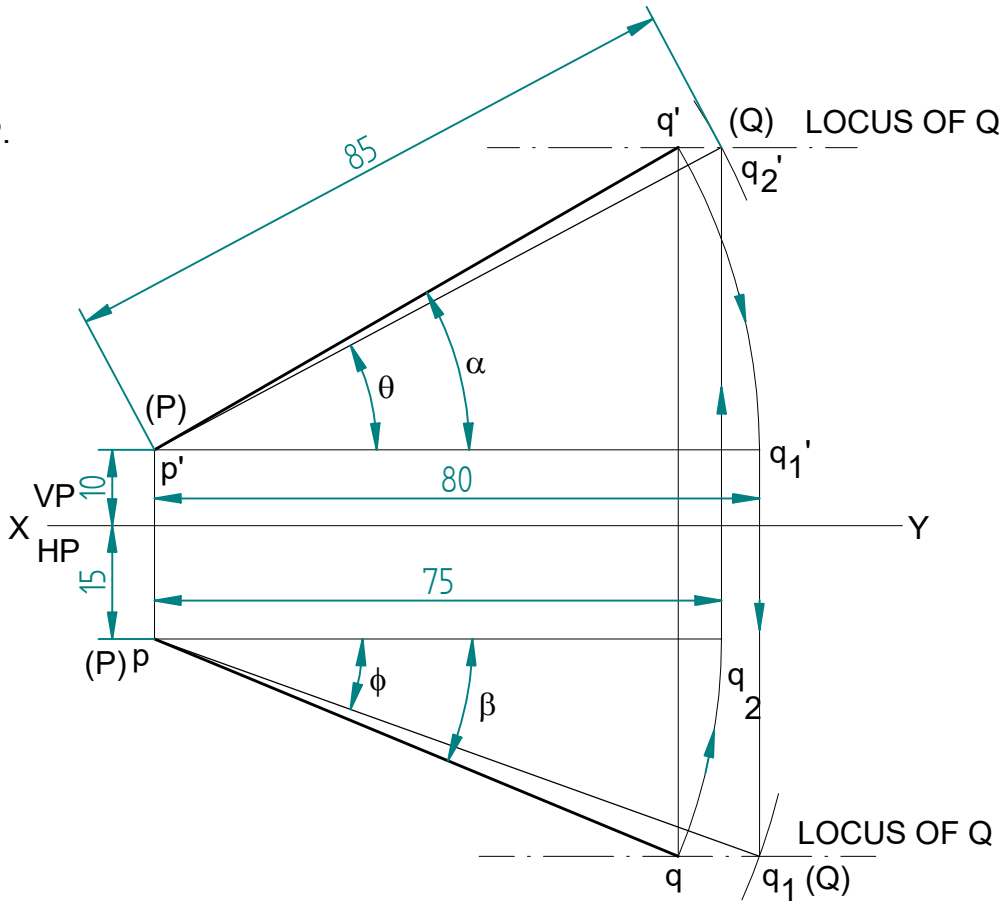
Data Given

True Length = PQ = 85 mm

End P 10 mm above HP and 15 mm infront of VP.

Apparent length in top view = p'q'= 75 mm

Apparent length in front view = pq = 80 mm



ANSWERS

θ = 28.07°
α = 30.00°
ϕ = 19.75°
β = 22.52°