

Unit-2. Projections of straight line. (2nd part).

The shortest distance between two points is called straight line. It has length but negligible ~~distance~~ thickness.

To draw the Front view, top view and side view of a straight line is called Projections of straight line.

Position of line	Front View or elevation	Top View or Plan.
1. Line parallel to H.P. and V.P.	True Length and parallel to $\text{xy}$	True Length and parallel to $\text{xy}$ .
2. Line $\perp$ to HP & parallel to V.P.	True Length and perpendicular to $\text{xy}$	Point True Length and $\perp$ to $\text{xy}$ .
3. Line $\perp$ to VP and parallel to H.P.	Point	True Length and Inclined at $\theta$ to $\text{xy}$ .
4. Line in HP and Inclined at VP.	Shorter than true length and lies in $\text{x-y}$	

## Unit-2

### Projections of Lines :-

1. Line parallel to both HP & VP.
2. Line Inclined is  $\perp$  to HP &  $\parallel$  to VP
3. Line is  $\perp$  to VP &  $\parallel$  el to HP
4. Line is Inclined to HP &  $\parallel$  el to VP
5. Line is Inclined to VP &  $\parallel$  el to HP.
6. Line is Inclined to both plane.

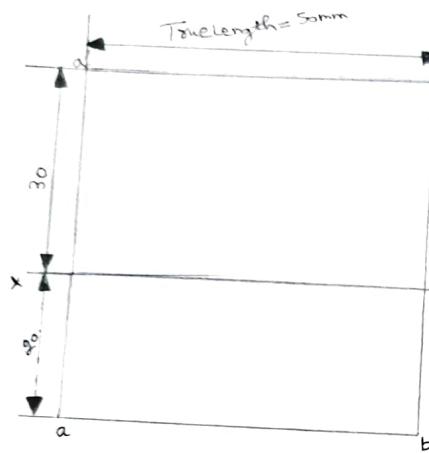
**Q-1.** A line AB, 50mm long & has its end A 30mm away from HP & 20mm away from VP. The line is parallel to both HP & VP. Draw its projections in all the four Quadrant.



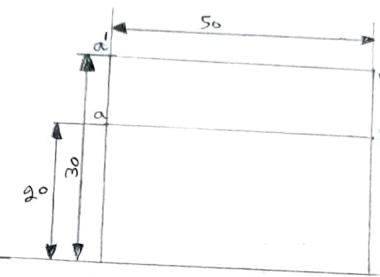
F.V. main line  
Top View

VP

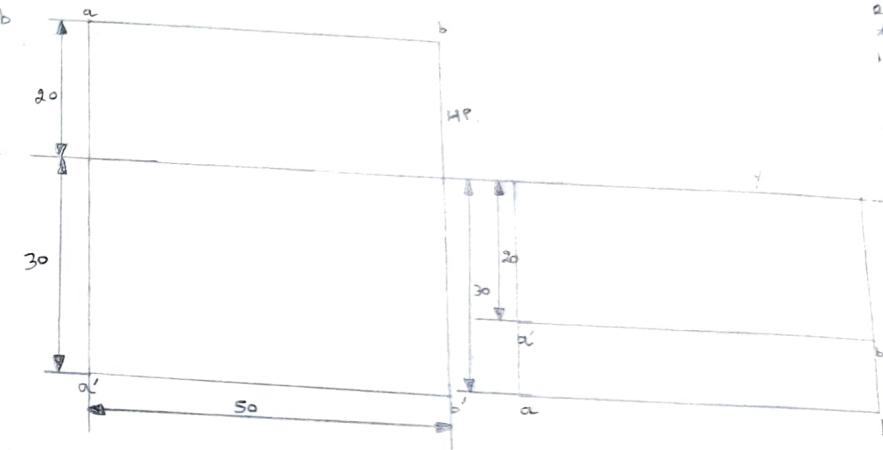
HP



1st Quadrant



2nd Quadrant



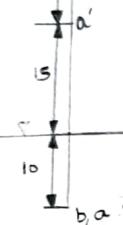
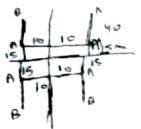
3rd Quadrant

4th  
Quadrant

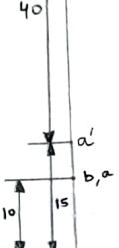
Case-2,3 Line Perpendicular to one of the Planes:-

Case-2:- Line  $\perp$  to HP is Parallel to VP.

Q-2. A line AB 40 mm Long is  $\perp$  to HP and its end A is 15mm away from the HP and 10mm away from VP and 10mm away from the VP. Draw the projections in all the Four Quadrants.  
Assume that the whole of line lies in same Quadrant.



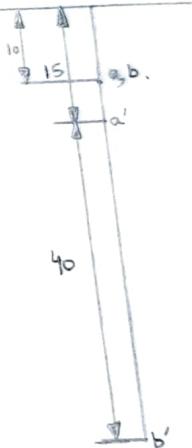
Ist quadrant.



2nd quadrant.



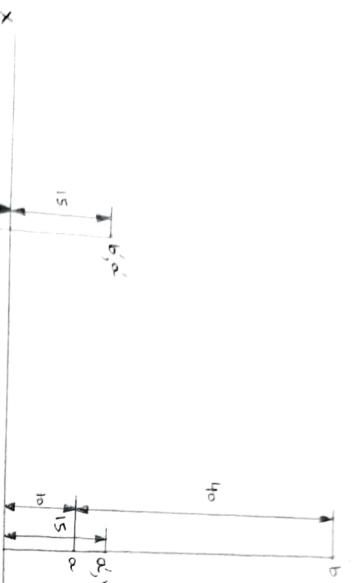
3rd quadrant.



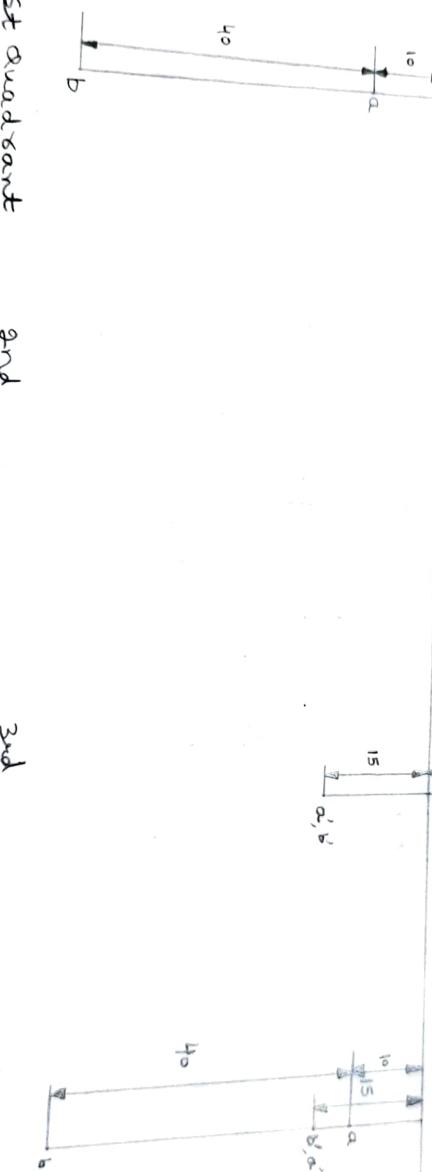
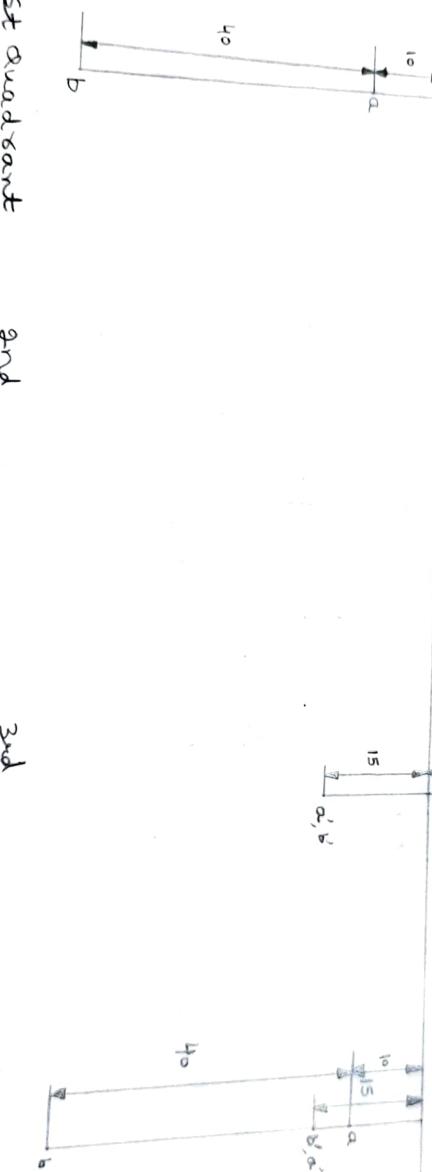
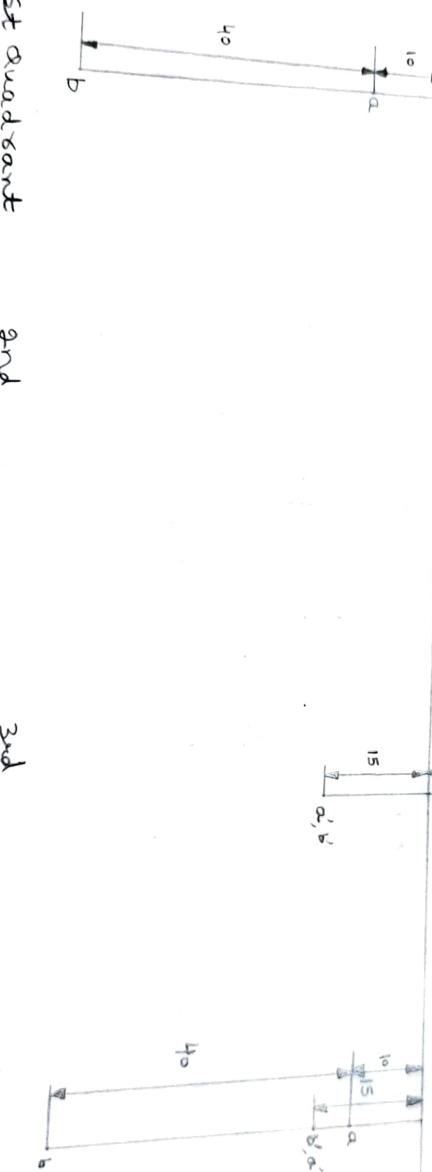
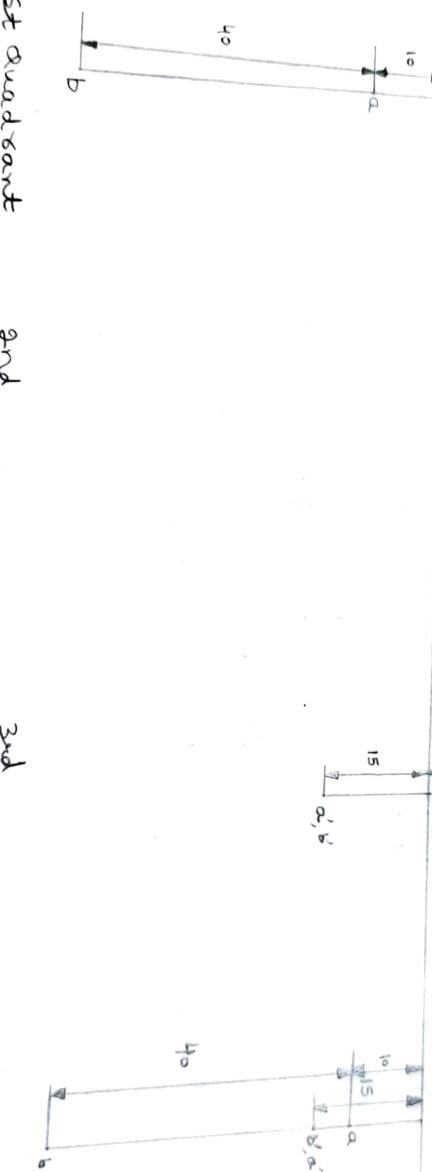
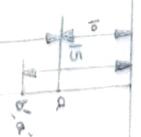
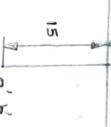
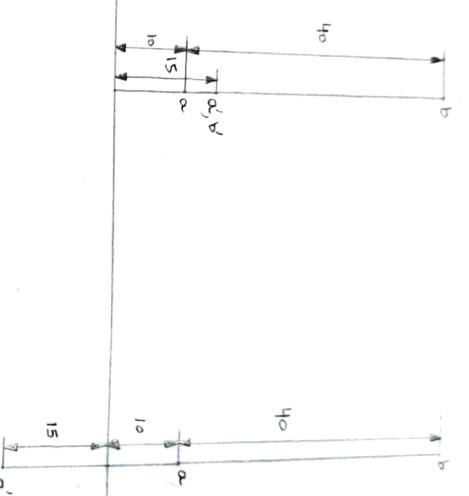
4th quadrant.

→ अपर्याप्त  
तीव्र प्रभाव 'b'  
अपर्याप्त 'a'.

Q-4 A line AB 40 mm long is perpendicular to VP and its end A is 15 mm away from the HP and 10 mm away from the VP draw its projections in all the four quadrants. Assume that whole of the line lies in same Quadrant.



→ Projection  
use BH of PH.  
Now we  
use HG pencil.



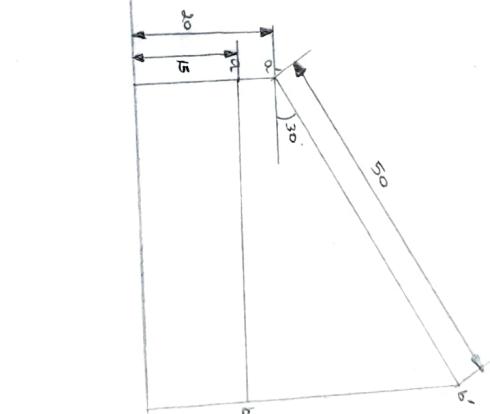
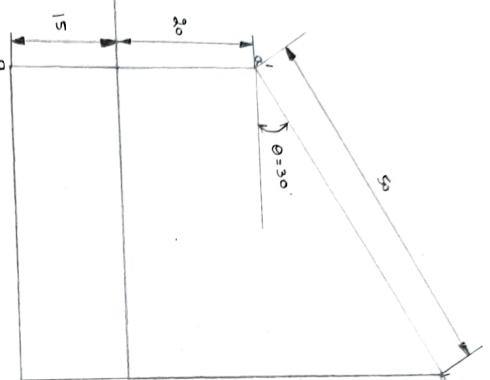
1st quadrant.  
and  
2nd  
quadrant.  
3rd  
quadrant.  
4th  
Quadrant.

Case-4 Line Inclined to HP and parallel to VP.

Q-4. A line AB 50mm long, has its end A as 25mm away from the HP and 15mm away from the VP. It is inclined to the HP at  $30^\circ$  and parallel to the VP. Draw its projections in all the four quadrants. Assume that the whole of the line lies in the same quadrant. Also locate its traces.



→ Inclined line inclined to  
HP at  $\theta = 30^\circ$  Top view  
Front view of line  
Straight line are  
straight!



1st quadrant.

2nd quadrant.

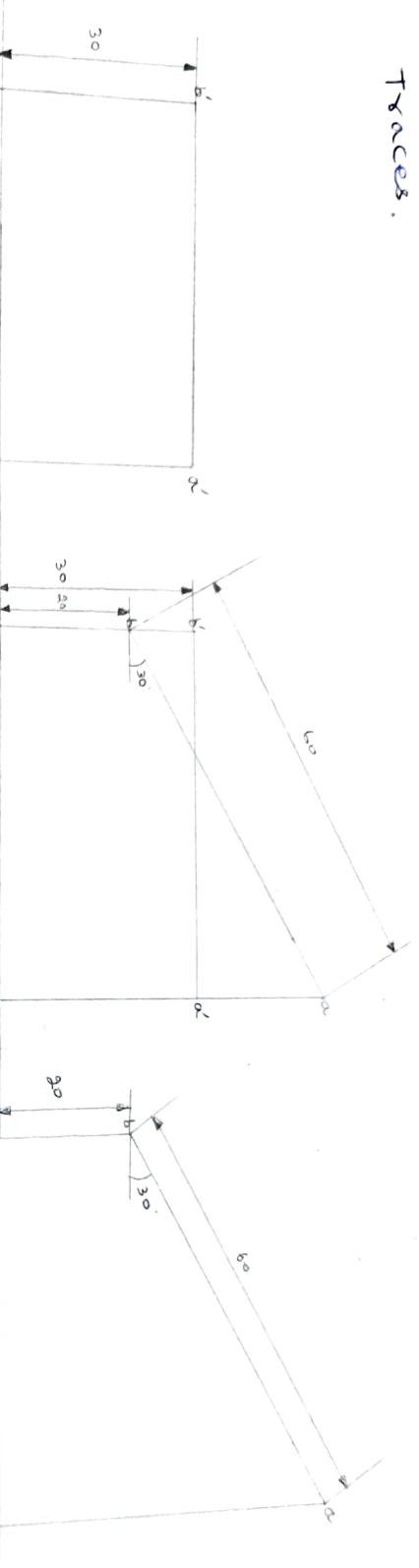
Ex-I we draw that  
point first through  
which we get exact  
length.

Ex F.V. at  $\theta = 30^\circ$   
at true length  
2nd quadrant

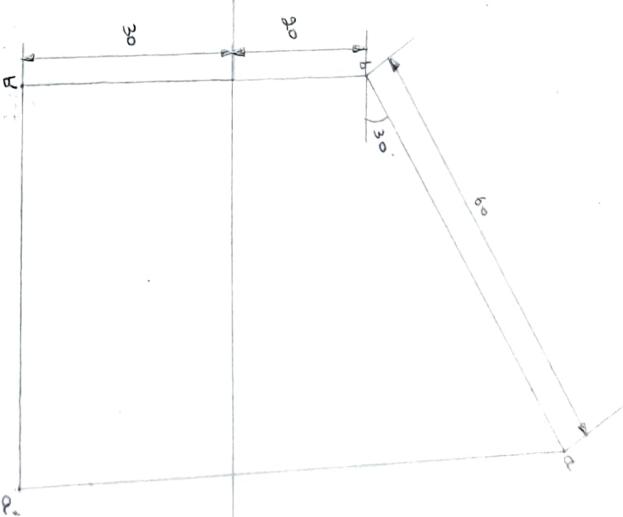
P-I

Q-5 A line AB, 60mm long, has its end B 30mm away from HP and 20mm away from VP.  
 The line is parallel to HP and is inclined at  $30^\circ$  to VP. Draw its projections in all the  
 four quadrants, when the whole line lies in the same quadrant. Also locate its  
 traces.

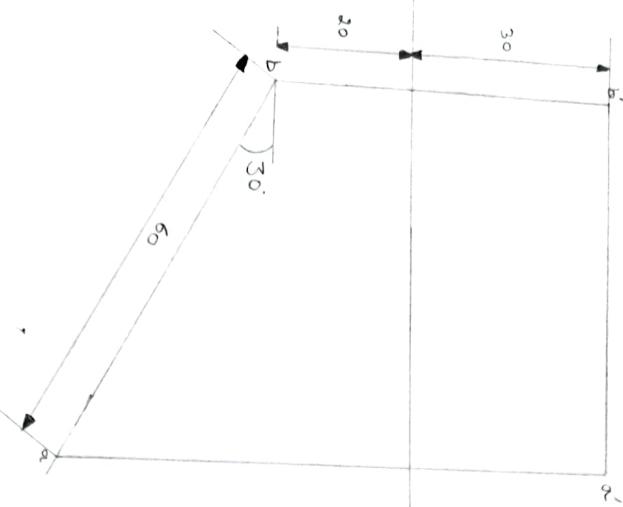
H.P. of line  
 incl. at V.P.  
 & actual length  
 of the line!



1st quadrant.



2nd quadrant.

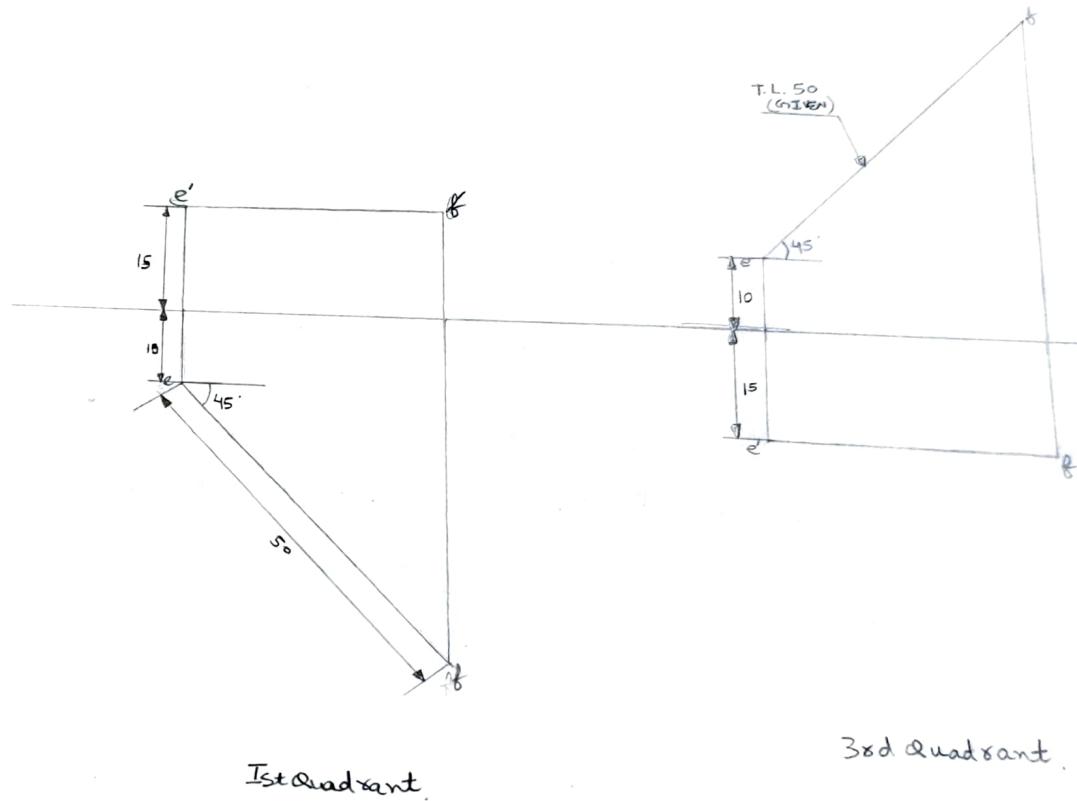


3rd quadrant.

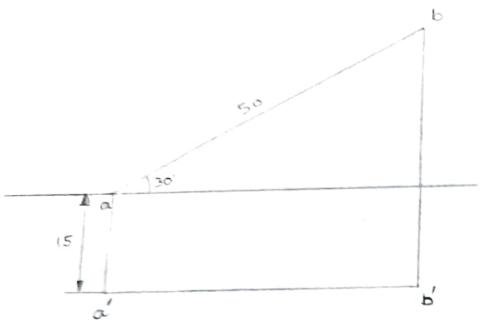
Case - V Line parallel to HP & Inclined to VP.

ISR

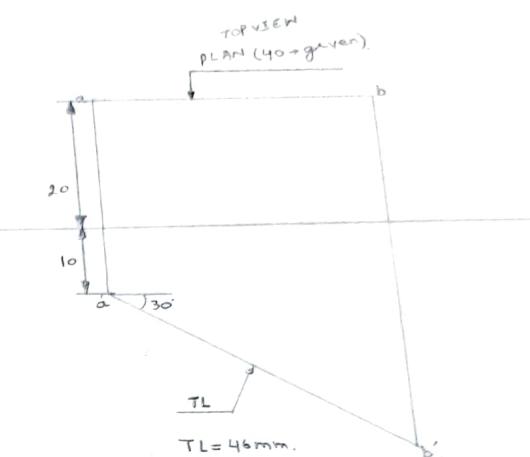
Q-6. A line EF, 50mm long, parallel to HP and inclined at 45° to VP, has its end E 10mm behind the VP and 15mm below the HP. Assuming the line to be in third quadrant, draw its projections.



Q-7 Line AB, 50mm Long, parallel to HP and Inclined to VP at  $30^\circ$  has its end A 15mm below the HP and in the VP. Assuming the line to be in third quadrant. Draw its projections.



Q-7 (Third quadrant).



Q-8. Plan ab of a line AB, measures 40mm. The line is parallel to VP and inclined to HP at  $30^\circ$  and its end A is 10mm below HP and 20mm behind VP. Draw the projections of the line and determine its true Length. Assume the line to be in third quadrant.

Case-II Line is Inclined to both HP & VP.

Type-I

Q. A line AB, has its end A 7mm behind VP and 18mm below HP and the end B 38mm behind the VP and 49mm below the HP. The distance between the end projectors is 37mm.

the VP and 49mm below the HP. The distance between the end projectors is 37mm.

Draw the projections of the line and Find out its TL,  $\phi$  & Traces.

Step-1. Draw the Projections

of pt. A & B.

A  $\rightarrow$  Third Quadrant ( $a, a'$ )

B  $\rightarrow$  Third Quadrant ( $b, b'$ )

Join  $ab, a'b'$ .

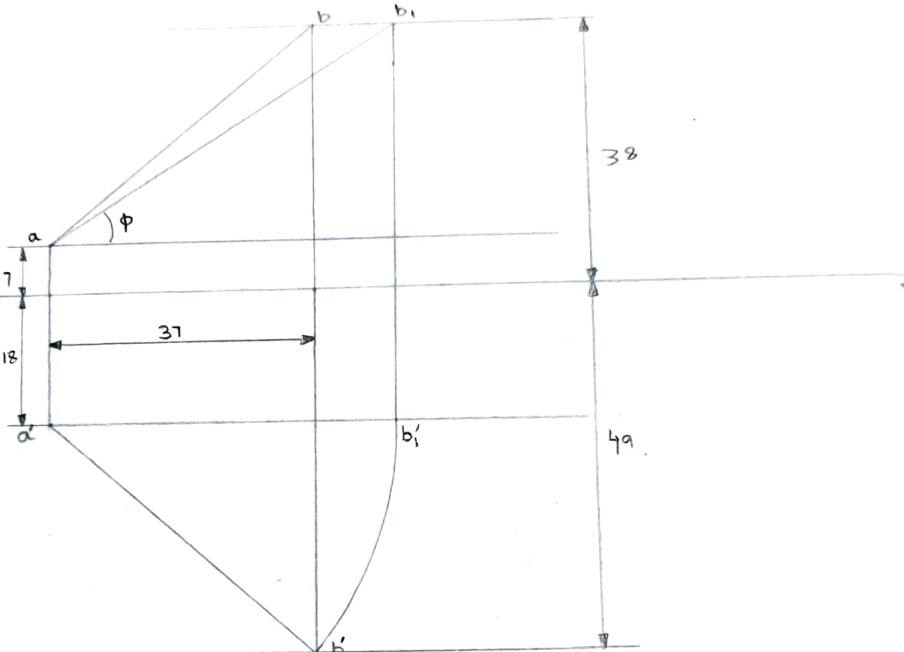
Step-2. Draw Horizontal line  
at pt.  $b$  &  $b'$ .

Step-3 Draw Horizontal line

From  $a$  &  $a'$  parallel to

X-Y line.

Step-4. Rotate  $a'b'$  about  $a'$  to  
Position  $a'b'$  so that it  
becomes parallel to X-Y line.



Top view at ' $\phi$ ' position.

FV  $\rightarrow a', b'$        $a', b'$   
TV  $\rightarrow a, b$        $a, b$

← True Length

$$\phi = 32^\circ$$