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1) Draw the projections of the following points on the same ground line, keeping the projectors 25 mm apart.

A	in the HP, 20 behind VP.
B	40 above HP, 25 in front of VP.
C	in the VP, 40 above HP.
D	25 below HP, 25 behind VP.
E	15 above HP, 50 behind VP.
F	40 below HP, 25 In front of VP.
G	in both HP & VP.

Ans) For points, remember the following simple rules.

From HP ⟹ FV ⟶ a'.

From VP ⟹ TV ⟶ a.

Rules to remember the positions from HP/VP

1) **HP:** 3 positions are **above, in & below.**
2) **VP:** 3 positions are **in front, in and behind.**

For drawing the projections from x-y:

1) **HP**: Treat it **same** as **x-y**.

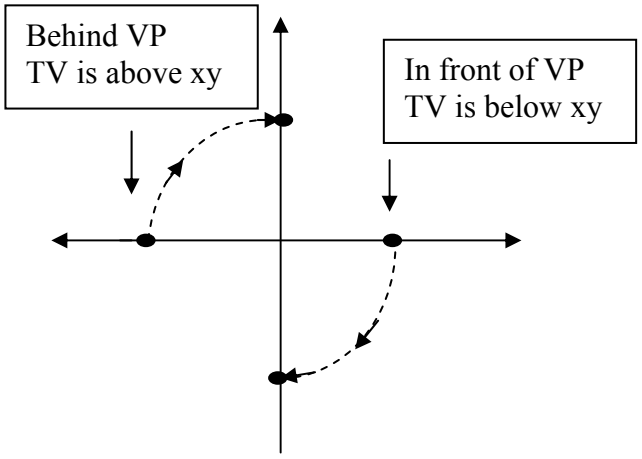
HP ⟹ x-y.

Above HP ⟶ above xy
Below HP ⟶ below xy
In/ On HP ⟶ on xy

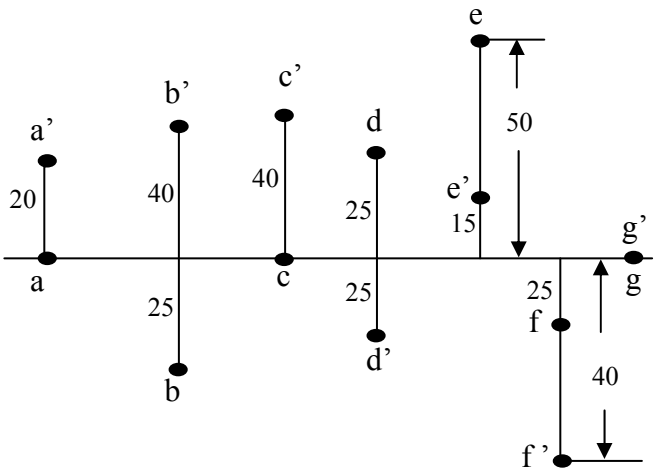
2) **VP**: Treat it as **right or left** .

Right ⟹ In front of VP
Left ⟹ Behind of VP

In front VP ⟶ below xy
Behind VP ⟶ above xy
In/ On VP ⟶ on xy



Now, using these above simple rules, just mark the points at the given distances from xy.



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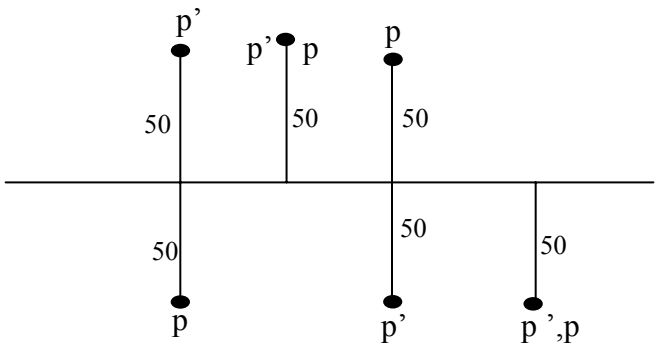
2) A point P is 50 mm away from both the reference planes. Draw its all possible projections.

Ans) Here, P is (50,50) from HP & VP.
Hence the possible positions are P in all 4 quadrants at (50,50).
Using our rules, we get the projections.

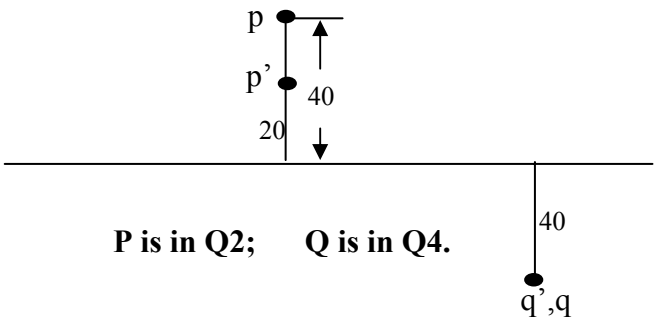
The following figure is the solution.



3) State the quadrants in which the following points lie.

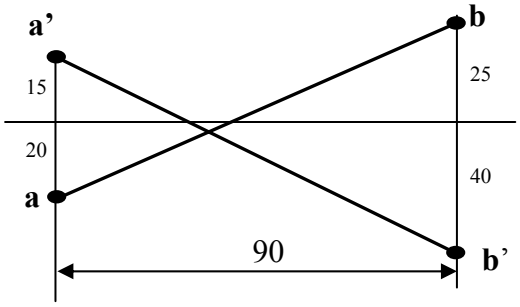
(i) P, its Top view is 40 above x-y; its FV 20 below the top view.
(ii) Q, both of its views coincide at a point 40 below x-y.

Ans) Here, the position of point is given from x-y. So, identify the position and relate them with HP & VP.



P is in Q2; Q is in Q4.

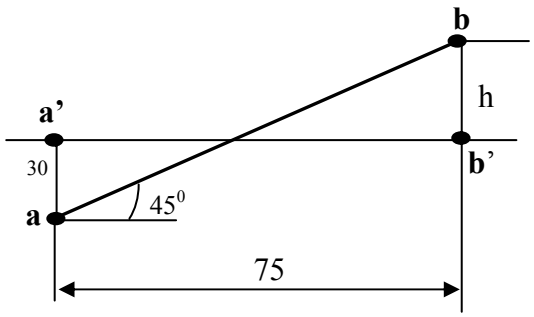
4) P is 15 above HP &20 in front of VP. Q is 40 below HP and 25 behindVP. The distance between their projectors is 90 mm. Draw lines joining their
(i) top views. (ii)Their front views.



5) State the positions of the given points from the figure.
Ans) Using rules, we get the points and their positions as follows.
A 20 above HP, 50 in front of VP.
B in the VP, 40 below HP.
C 30 below HP, 20 behind VP.
D in HP, 30 behind VP.
E 40 above HP, 15 behind VP.

6) 2 points A & B are in the HP. A is 30 in front of VP and B is behind VP. The distance between the projectors is 75. the line joining their top views makes 45^0 with x-y. Draw its projections & find distance of B from VP.

Ans) Mark the points at the given positions and get the distance.



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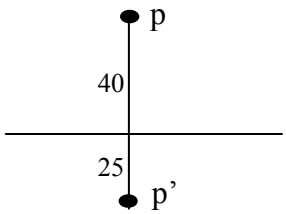
7) P is 20 below HP & lies in III quadrant. Its shortest distance from xy is 40. draw its projections.

Ans) P in III Quadrant means P is behind VP and hence its TV is above xy.

Also the shortest distance from xy is the ⊥ distance from xy. Either p' or p must be 40. Since p' is 25, hence p must be 40 above xy.



9) A point 30 above xy is the plan view of 2 points P & Q. Elevation of P is 45 above HP while that of Q is 35 below HP. Draw the projections and state their positions and Quadrants.

Ans) Plan view means Top View
Elevation means Front View

Since P & Q are on the same line, hence there is no distance between projectors and hence the FV & TV of P & Q lie on the same projector.

p, q ⟶ 30 above xy.

p' ⟶ 45 above xy.

q' ⟶ 35 below xy.

P ⟶ Q2.
Q ⟶ Q3.