

## CHAPTER 1

### PROJECTIONS OF POINTS

**Problem 1** Draw the projections of the following Points on the same XY line, keeping convenient distance between each projectors. Name the Quadrants in which they lie.

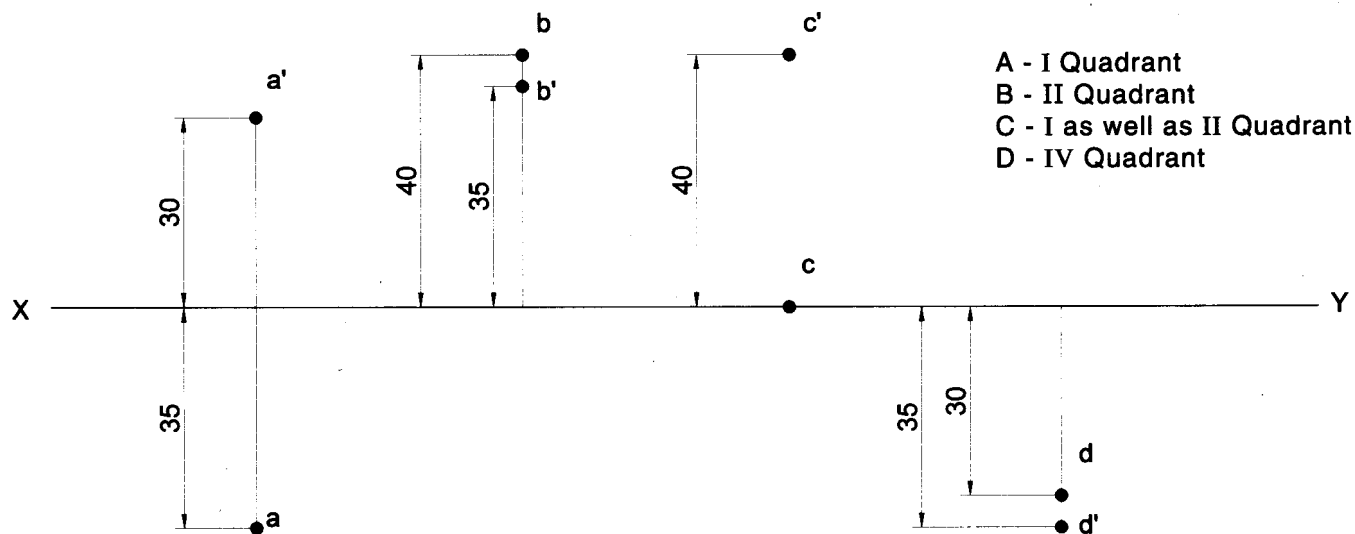
A – 30 mm above HP & 35 mm in front of VP.

B – 35 mm above HP & 40 mm behind VP.

C – 40 mm above HP & on VP.

D – 35 mm below HP & 30 mm in front of VP.

**Solution**



**Problem 2** Draw the projections of the following Points on the same XY line, keeping convenient distance between each projectors. Name the Quadrants in which they lie.

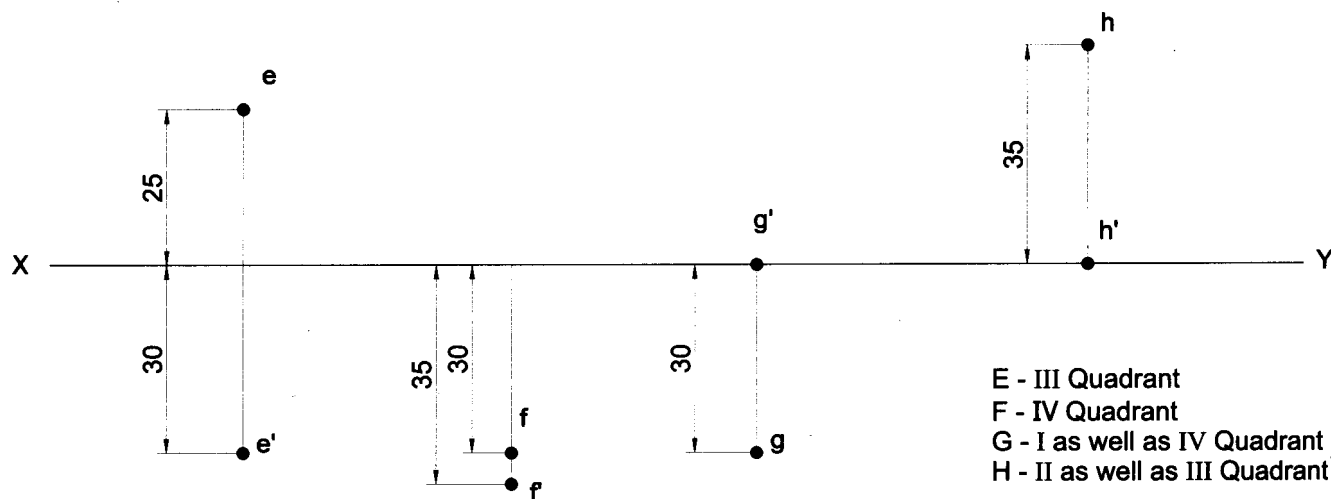
E – 30 mm below HP & 25 mm behind VP.

F – 35 mm below HP & 30 mm in front of VP.

G – On HP & 30 mm in front of VP.

H – On HP & 35 mm behind VP.

**Solution**



**Problem 3** Draw and state the quadrants in which the following Points are located. Assume any distances.

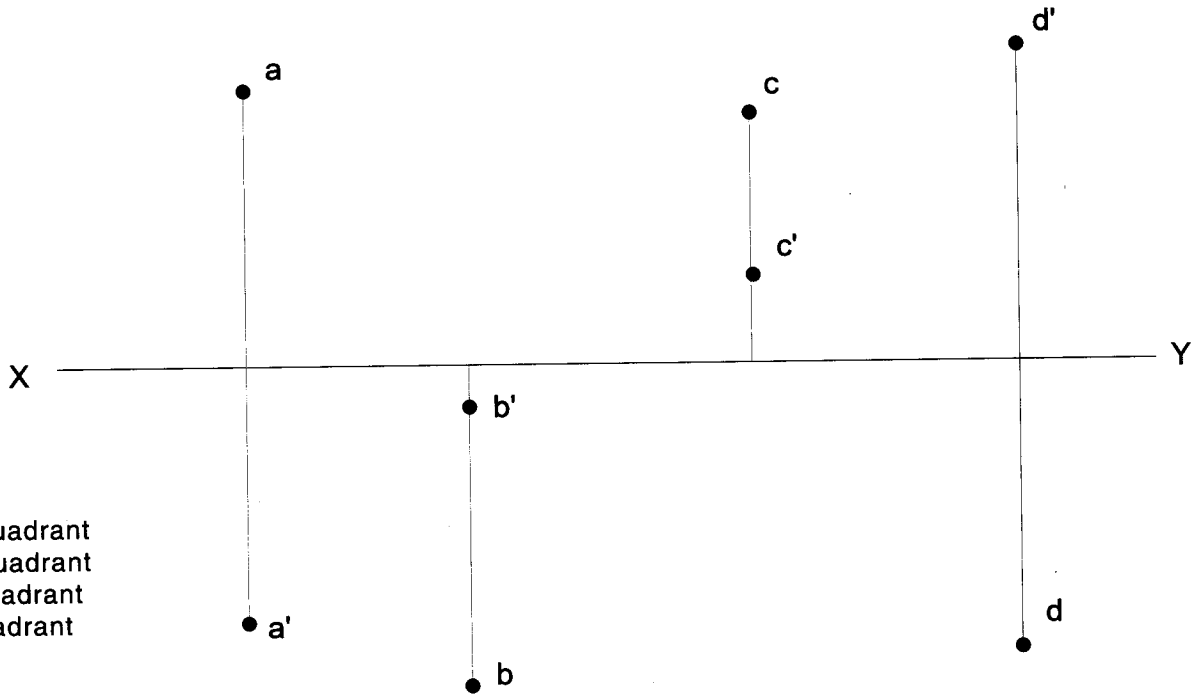
A – Front view below XY line & Top view above XY line.

B – Front and Top views are below XY line.

C – Front and top views are above XY line.

D – Front view above XY line & top view below XY line.

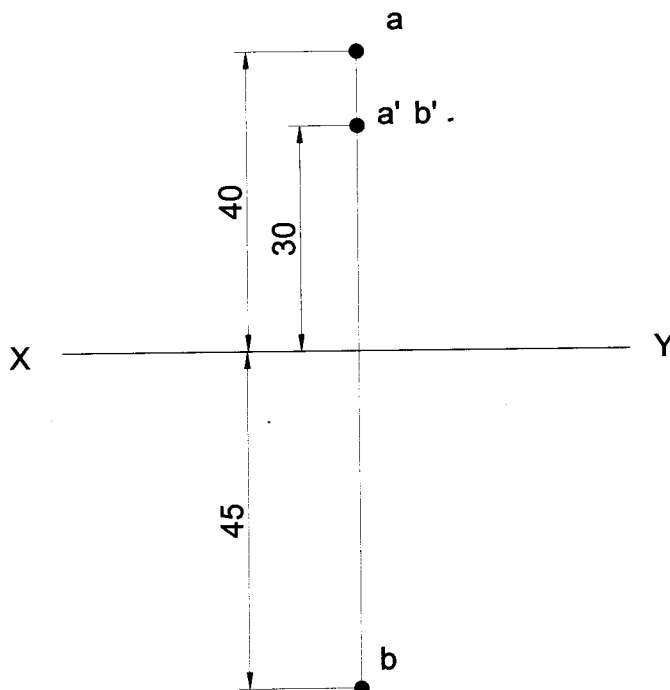
**Solution**



A - III Quadrant  
B - IV Quadrant  
C - II Quadrant  
D - I Quadrant

**Problem 4** A point 30mm above XY line is the front view of two points A&B. The top view of A is 40 mm behind VP & The top view of B is 45 mm in front of VP. Draw The projections of the points & state the quadrants in which the points are situated.

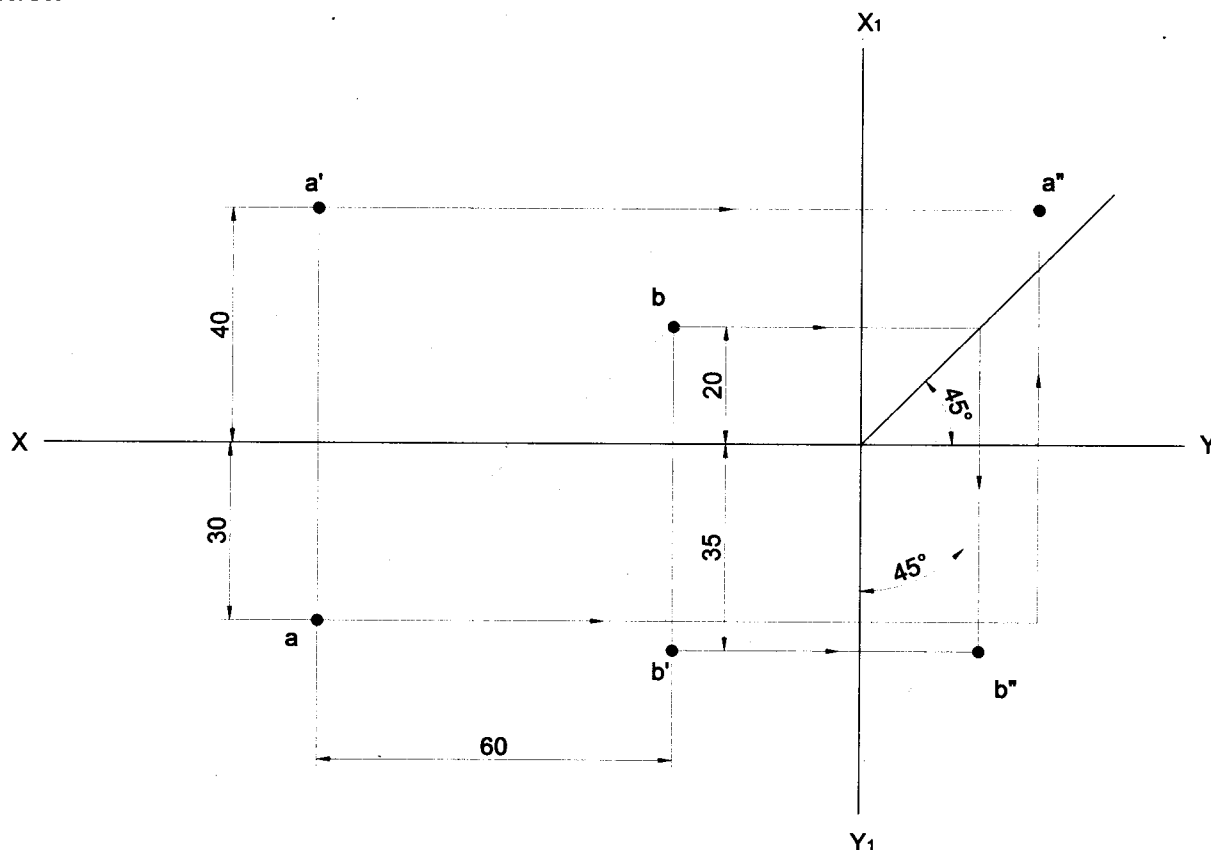
**Solution**



**ANSWERS :** A is in II Q  
B is in I Q

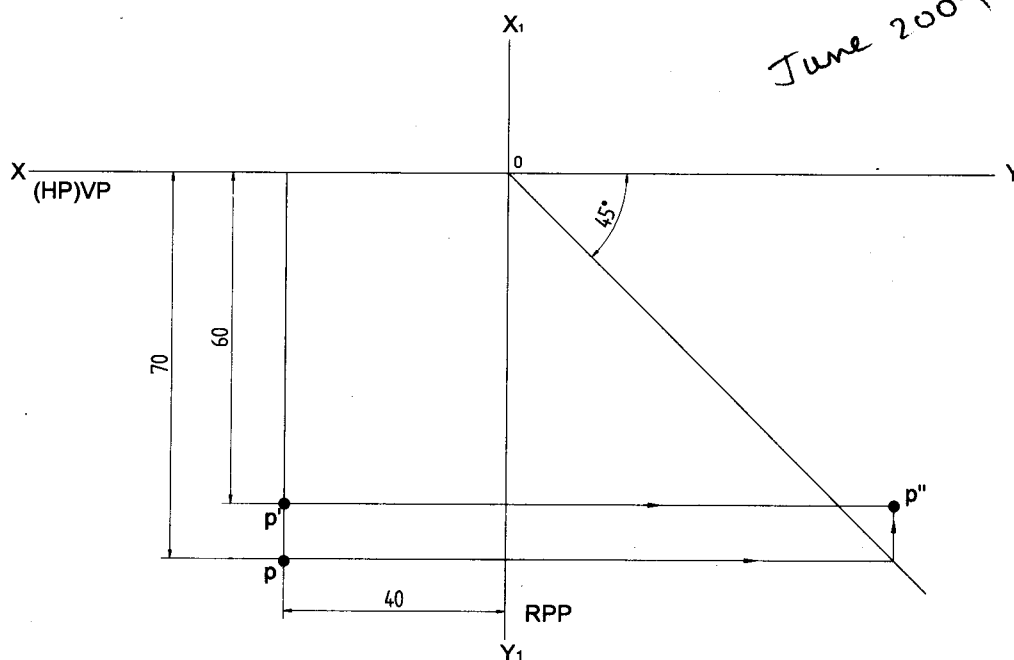
**Problem 5** A point 'A' is 30 mm in front of VP and 40mm above HP. Another point B is 20 mm behind VP & 35 mm below HP. The horizontal distance between the points measured parallel to XY line is 60 mm . Draw the three projections of the points. Join their front and top views.

**Solution**



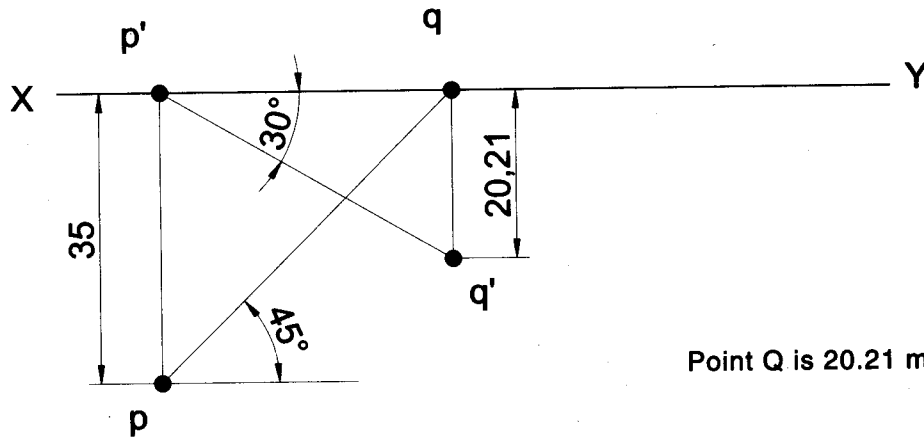
**Problem 6** Draw all the three views of a point P lying 60 mm below HP, 70 mm in front of VP and 40 mm from the RPP. Also state the quadrant in which it lies.

**Solution**



**Problem 7** A point P is on HP and 35 mm in front of VP. Another Point Q is on VP and below HP. The line joining their front views makes an angle of 30 deg to XY line, while the line joining their top views makes an angle of 45 deg with XY line. Find the distance of the point Q from HP.

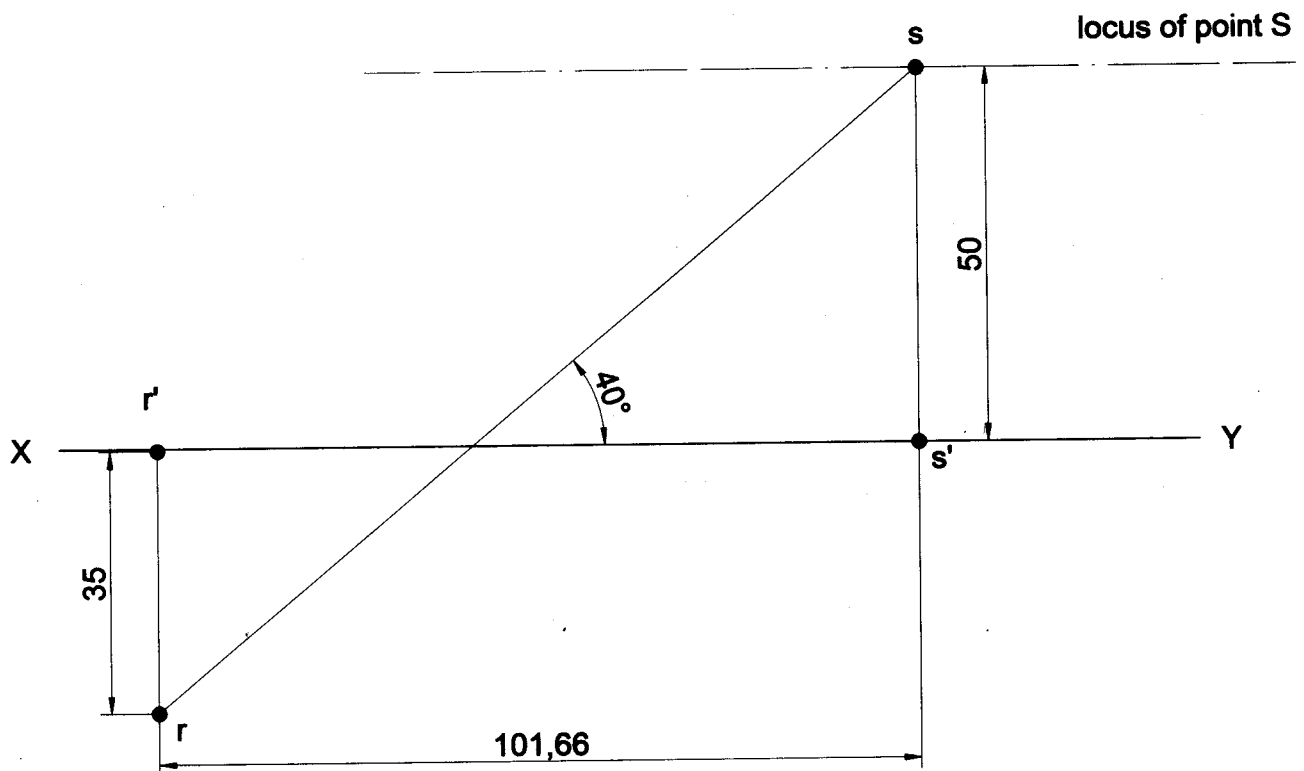
**Solution**



Point Q is 20.21 mm below HP

**Problem 8** Two Points R and S are on HP. The point R is 35 mm in front of VP, while S is 50mm behind VP. The line joining their top views makes an angle of 40deg with XY. Find the horizontal distance between the two projectors.

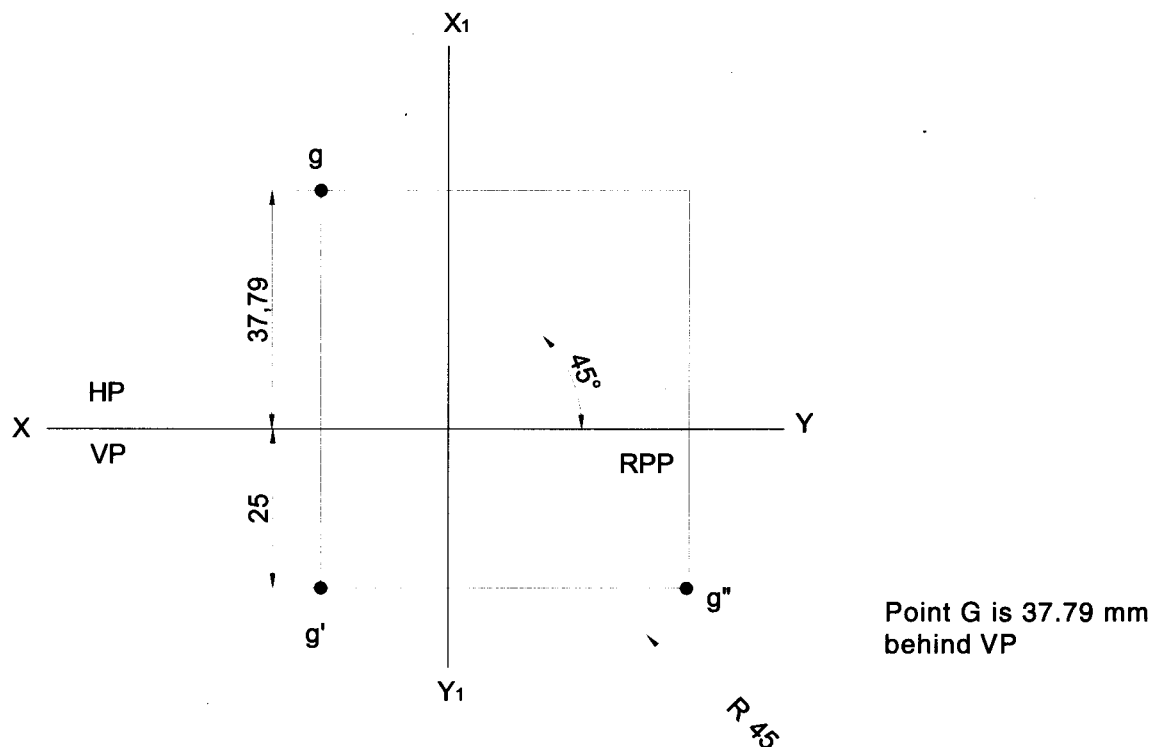
**Solution**



**ANSWER :** Distance b/w two projectors is 101.66 mm.

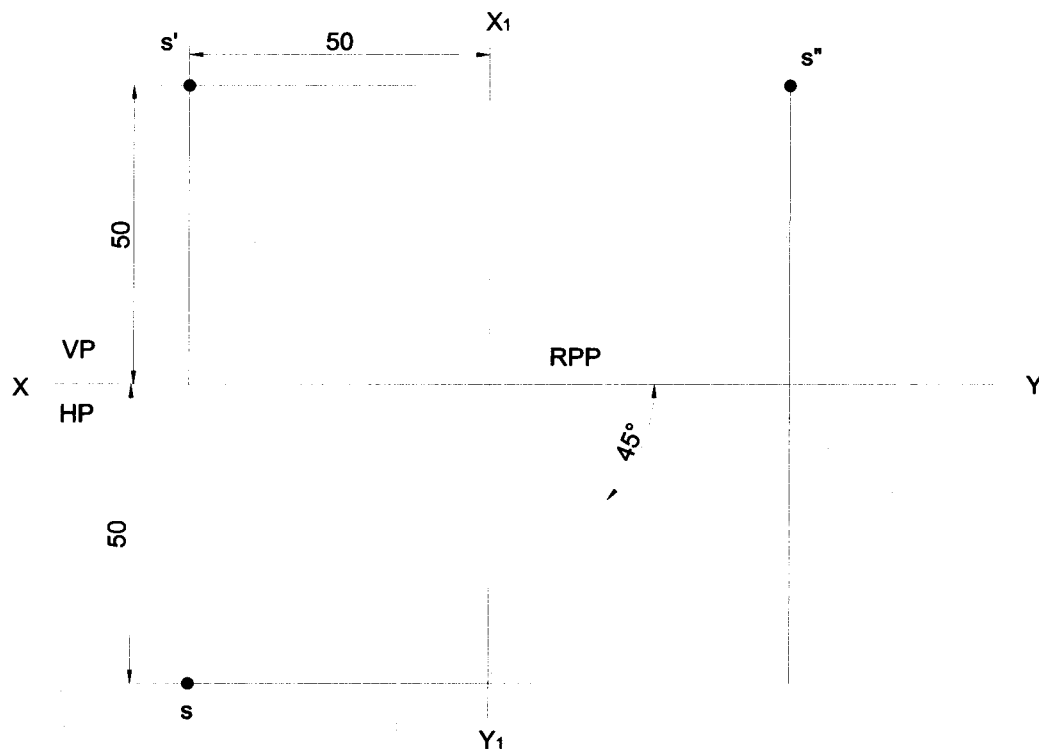
**Problem 9** A point G is 25 mm below HP & is situated in the third quadrant. Its shortest distance from the intersection of XY and X<sub>1</sub>Y<sub>1</sub> is 45 mm. Draw its projections and find its distance from VP.

**Solution**



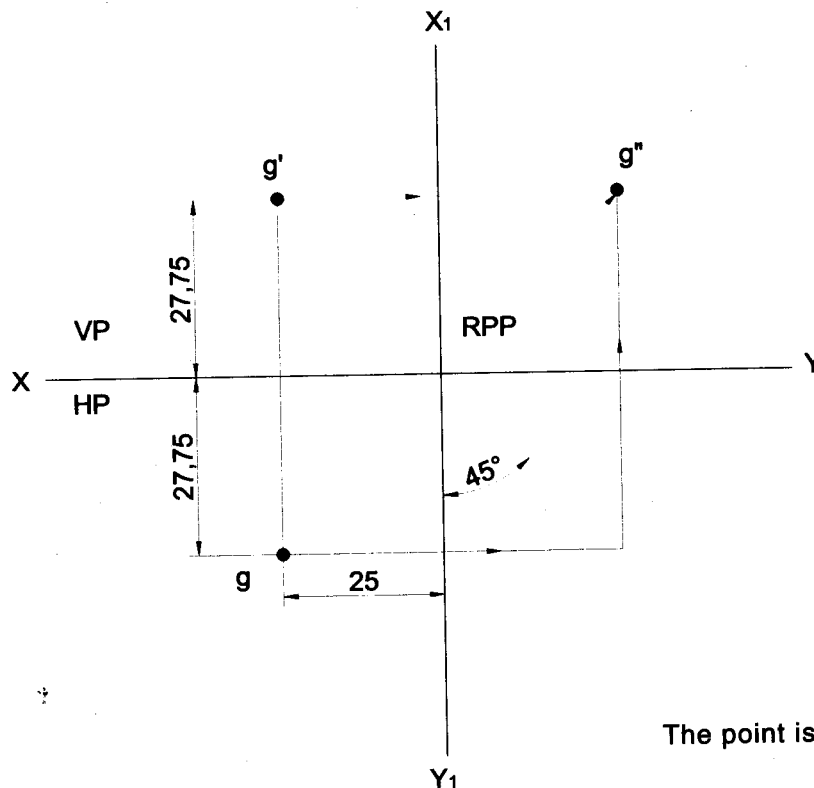
**Problem 10** A point S is in the first quadrant and equidistant of 50 mm from all the three principal planes. Draw the projections of the point. Draw all the three views of the point.

**Solution**



**Problem 11** Draw the projections of point G which is in first quadrant such that it is equidistant from HP & VP. The point is 25 mm from RPP. Determine its distances from HP&VP.

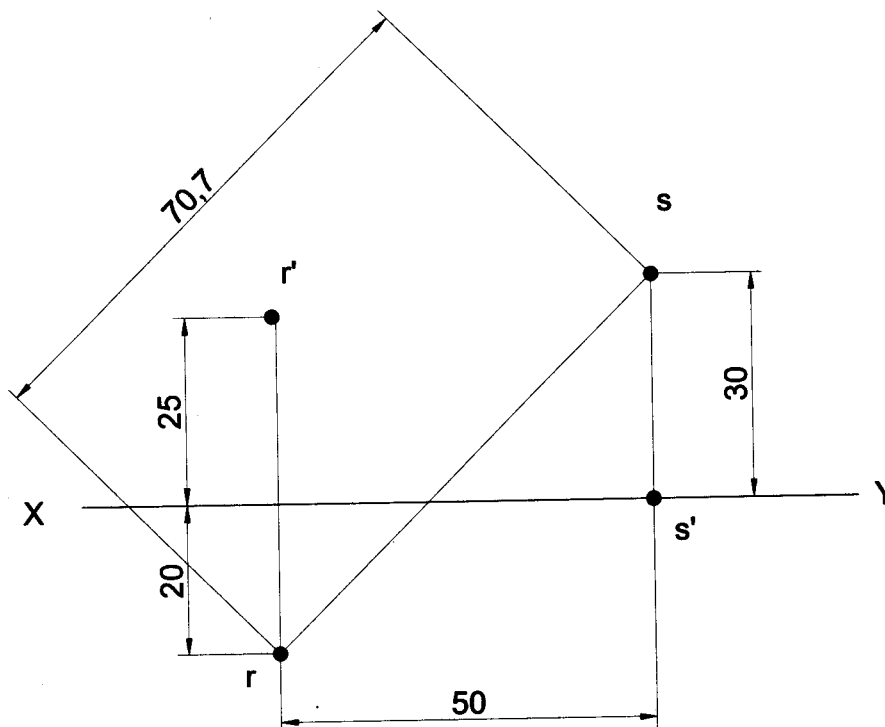
**Solution**



The point is 27.75 mm from VP and HP

**Problem 12** A point R is 25 mm above HP & 20 mm in front of VP. Another point S is on HP and 30 mm behind VP. The distance between their projectors measured parallel to the line of intersection of VP and HP is 50mm. Find the distance between the top views of points R and S.

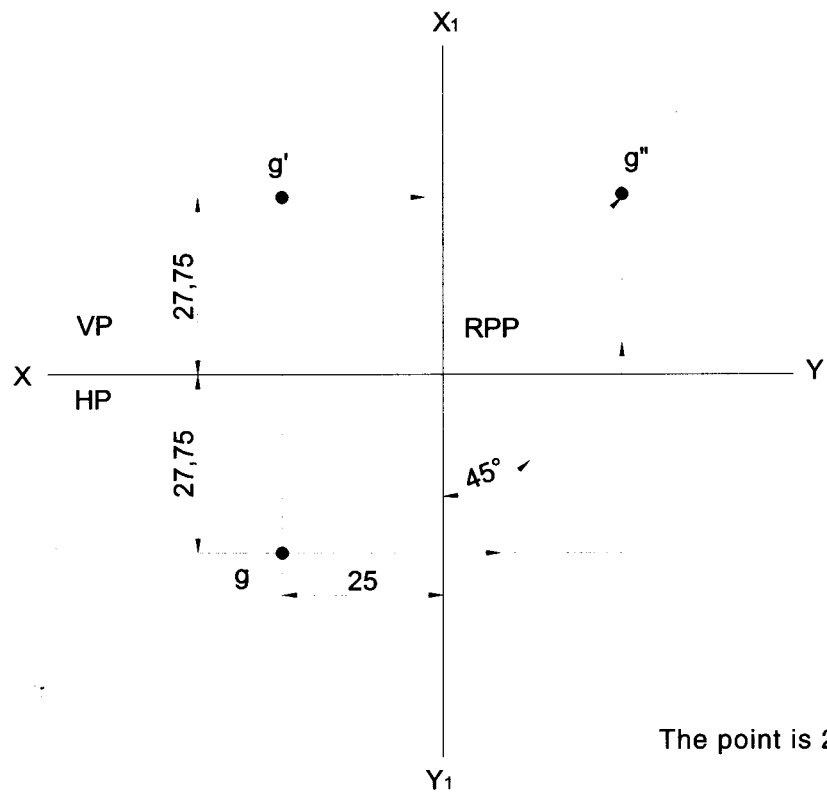
**Solution**



The Distance Between TVs of R and S is 70.7 mm

**Problem 11** Draw the projections of point G which is in first quadrant such that it is equidistant from HP & VP. The point is 25 mm from RPP. Determine its distances from HP&VP.

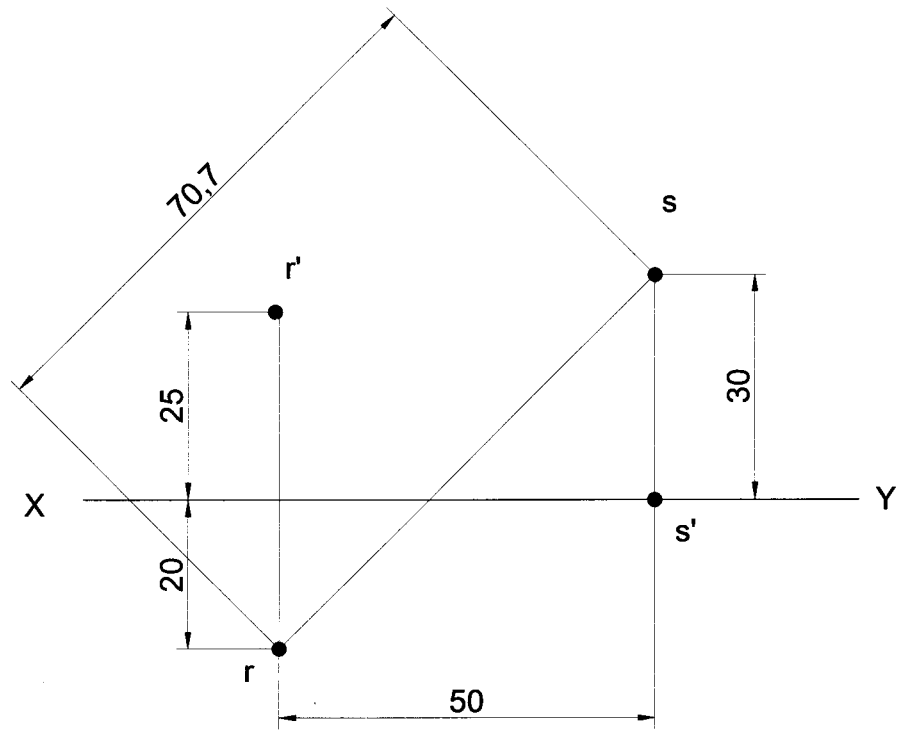
**Solution**



The point is 27.75 mm from VP and HP

**Problem 12** A point R is 25 mm above HP & 20 mm in front of VP. Another point S is on HP and 30 mm behind VP. The distance between their projectors measured parallel to the line of intersection of VP and HP is 50mm. Find the distance between the top views of points R and S.

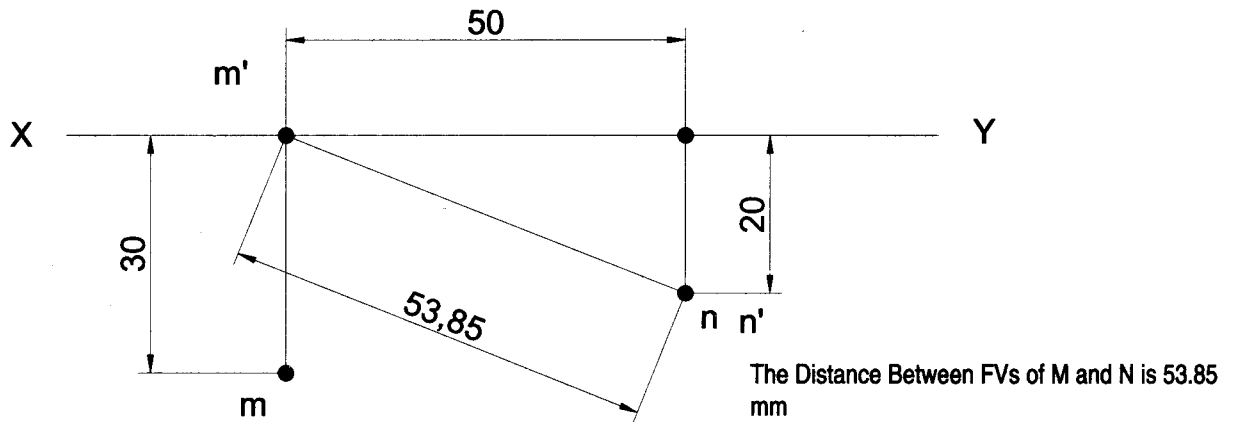
**Solution**



The Distance Between TVs of R and S is 70.7 mm

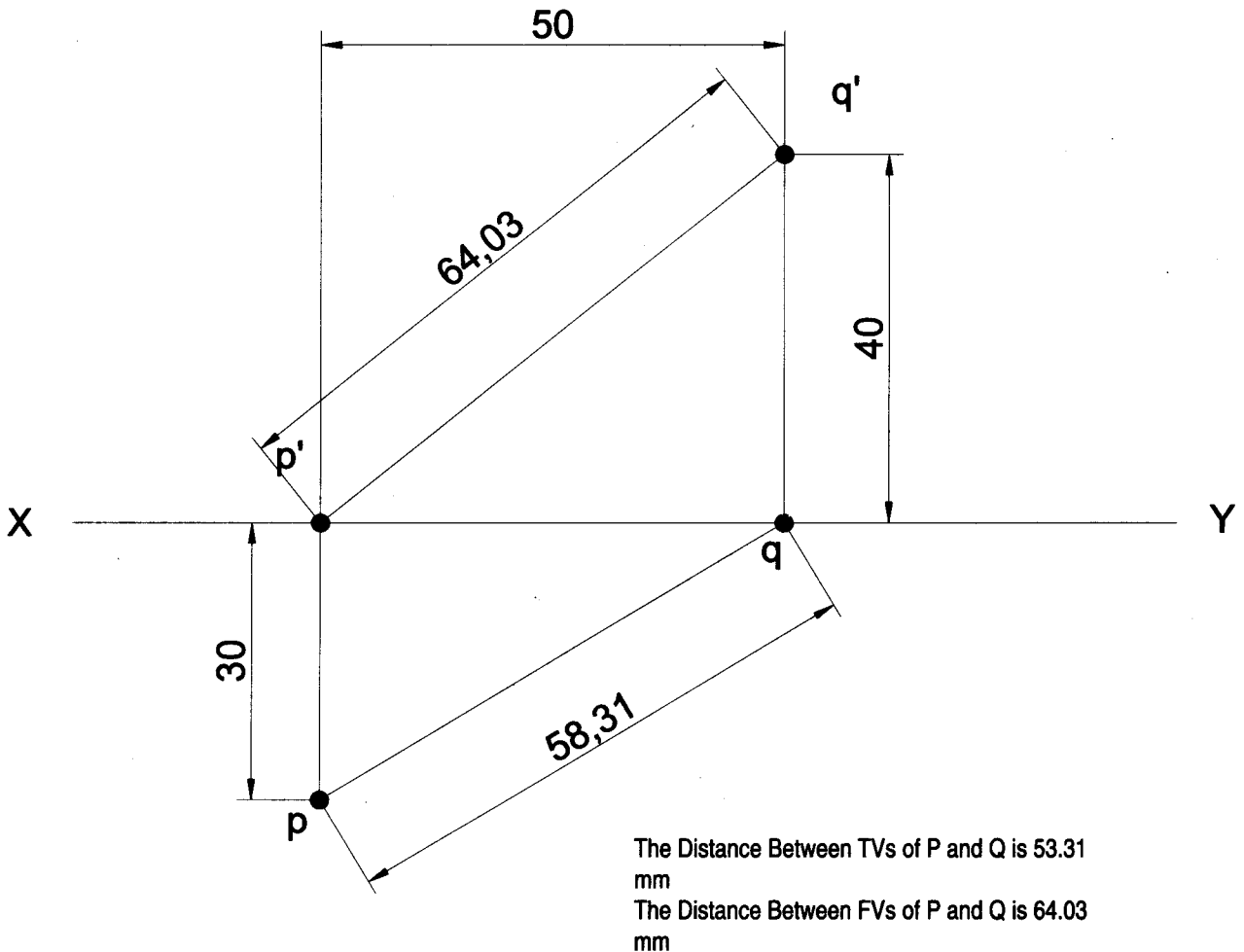
**Problem 13** A point M is on HP & 30 mm in front of VP. Another point N is 20 mm below HP and 20 mm in front of VP. The distance between their projectors measured parallel to XY line is 50 mm. Find the distance between front views of the points M & N.

**Solution**



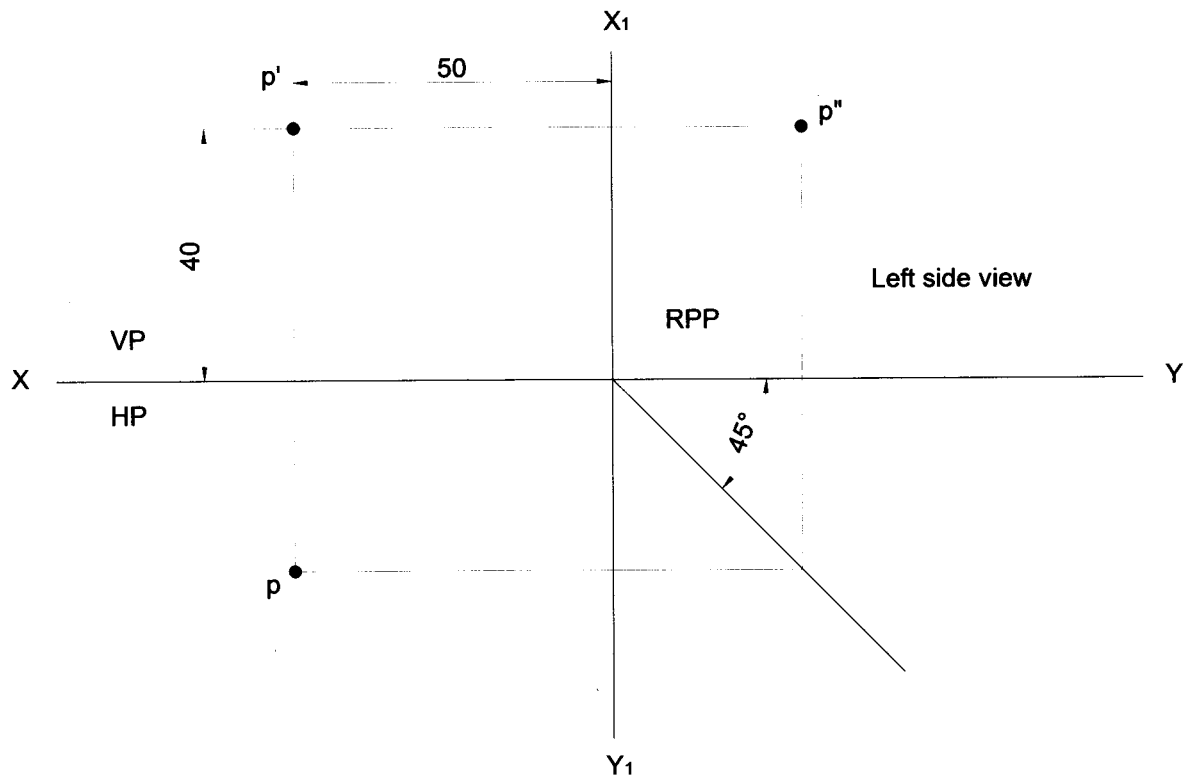
**Problem 14** A point P is on HP and 30 mm in front of VP. Another point Q is on VP and 40 mm above HP. The distance between their projectors parallel to XY line is 50 mm. Find the distance between their front and top views of the points P and Q.

**Solution**

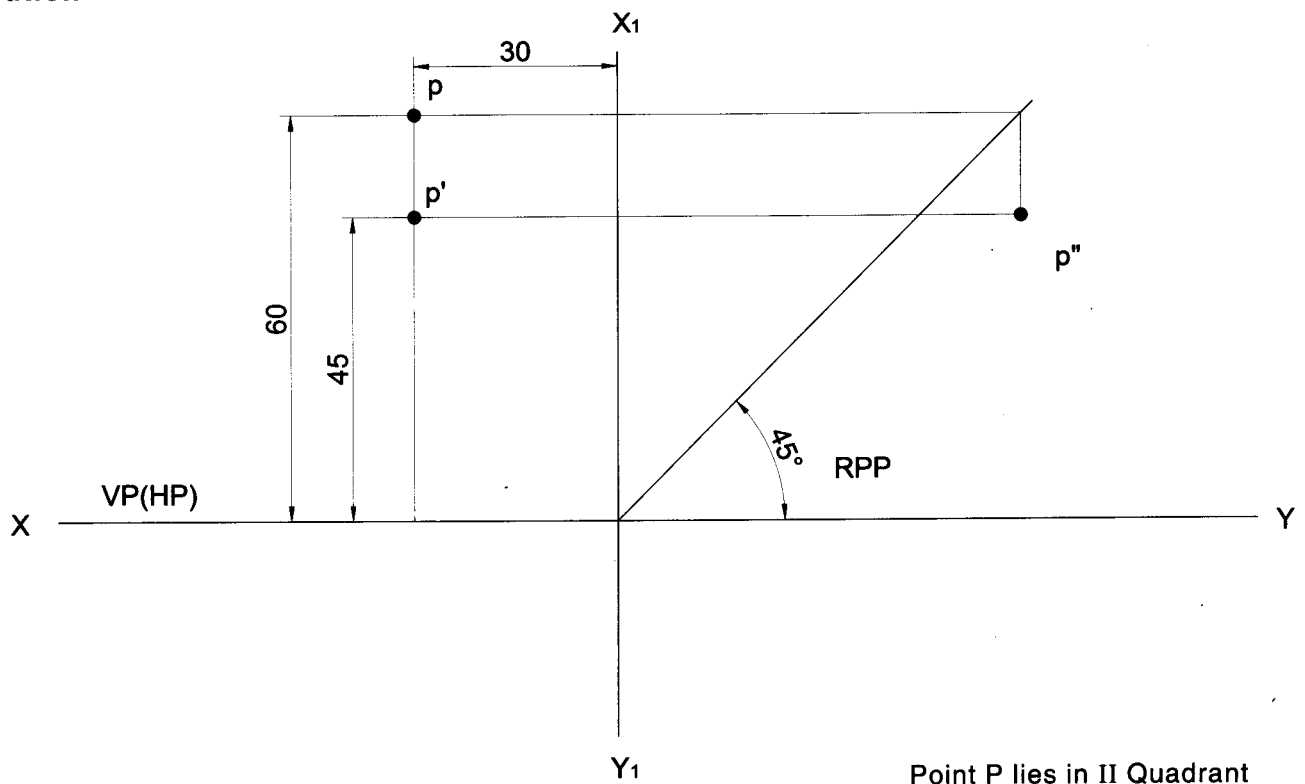




**Problem 15** A point P is 30 mm in front of VP, 40 mm above HP and 50 mm from RPP. Draw its projections.  
**Solution**

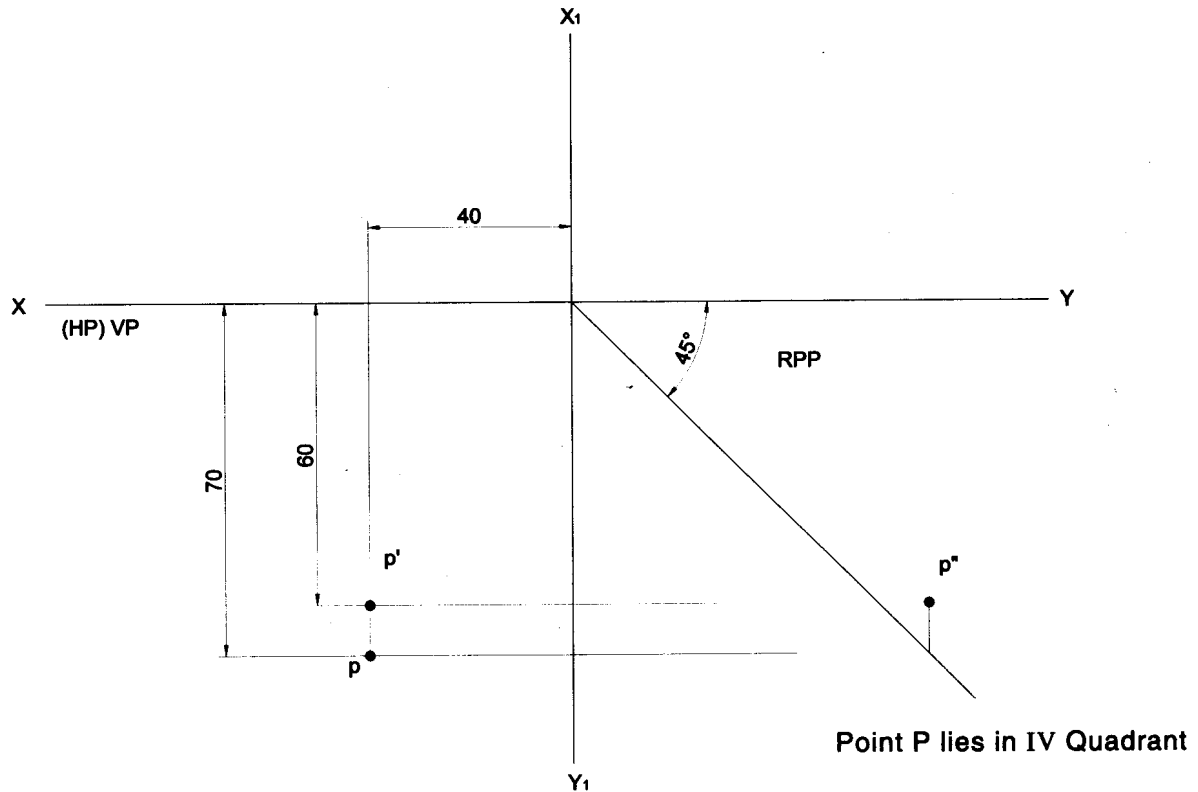


**Problem 16** The point P is 45 mm above HP, 60 mm behind VP and 30 mm from RPP. Draw the three principles view of the point. Also state the quadrant in which it lies.  
**Solution**



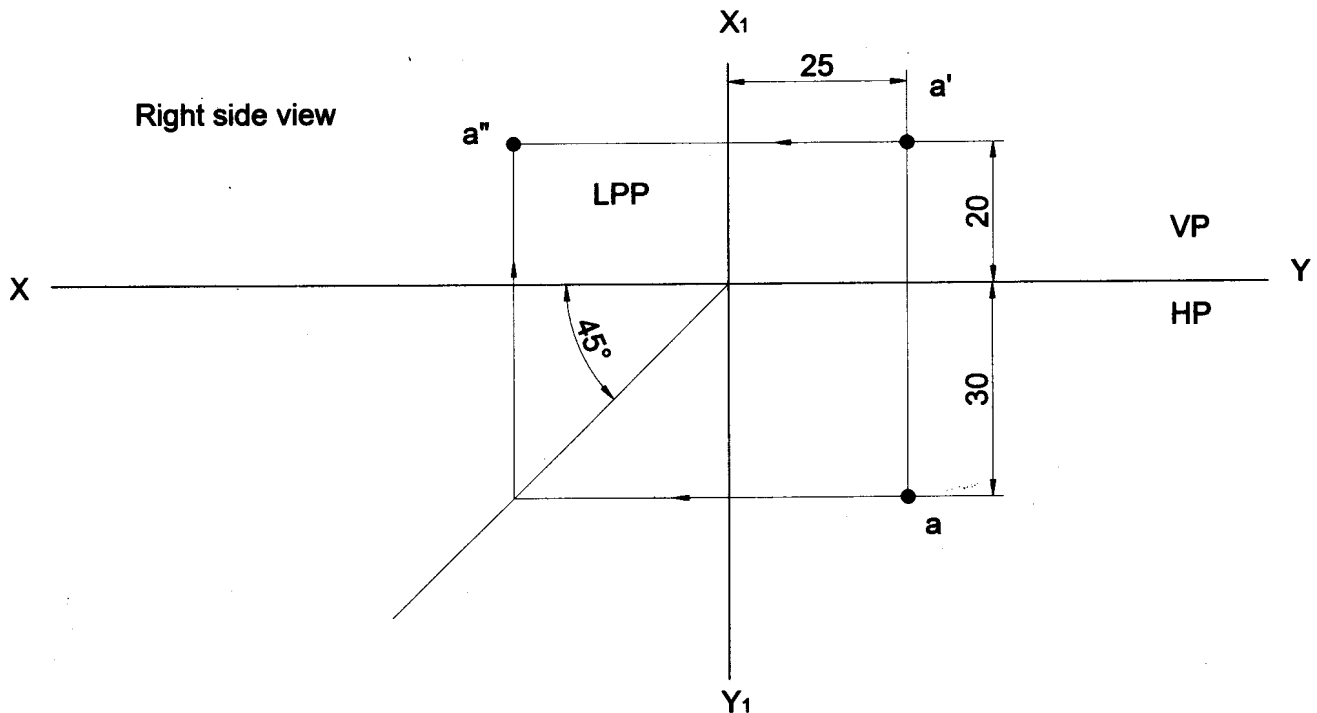
**Problem 17** Draw all the three views of a point P lying 60 mm below HP, 70 mm in front of VP and 40 mm from the RPP. Also state the quadrant in which it lies.

**Solution**



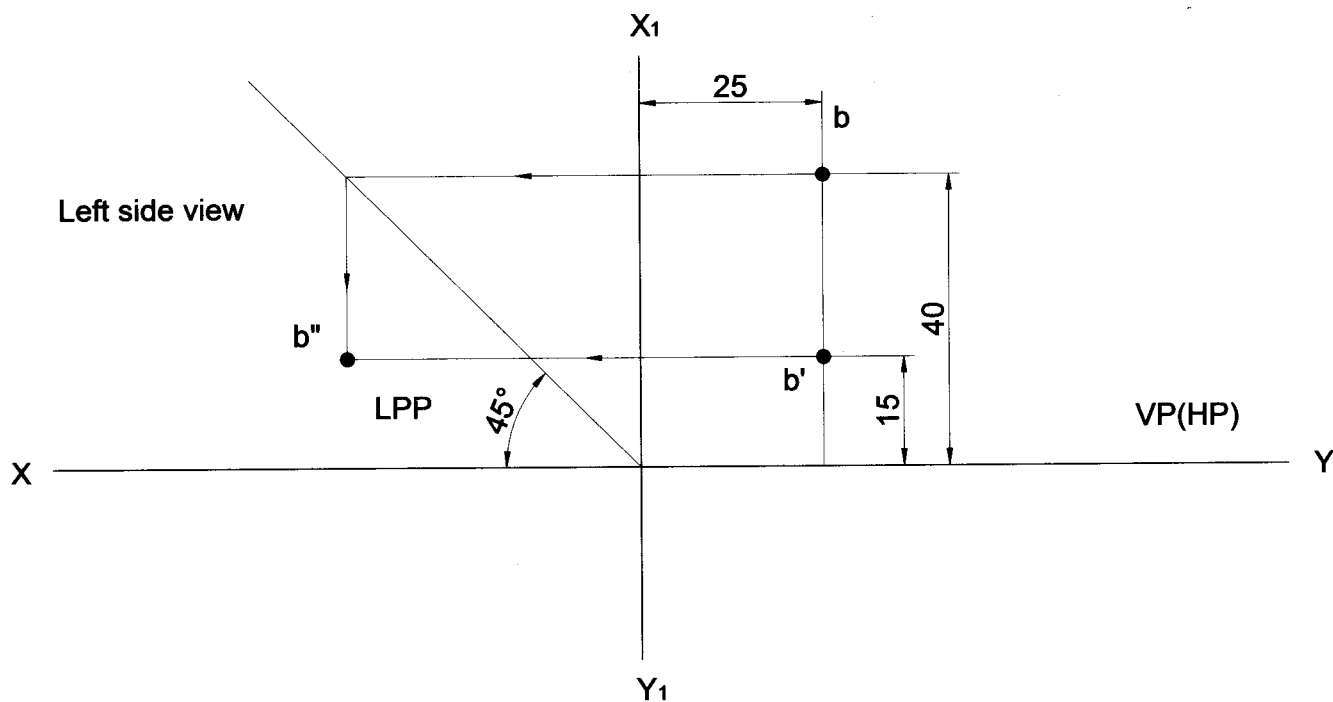
**Problem 18** A point is 30 mm in front of VP 20 mm above HP & 25 mm in front / behind / from LPP. Draw its Projections and name the side view.

**Solution**



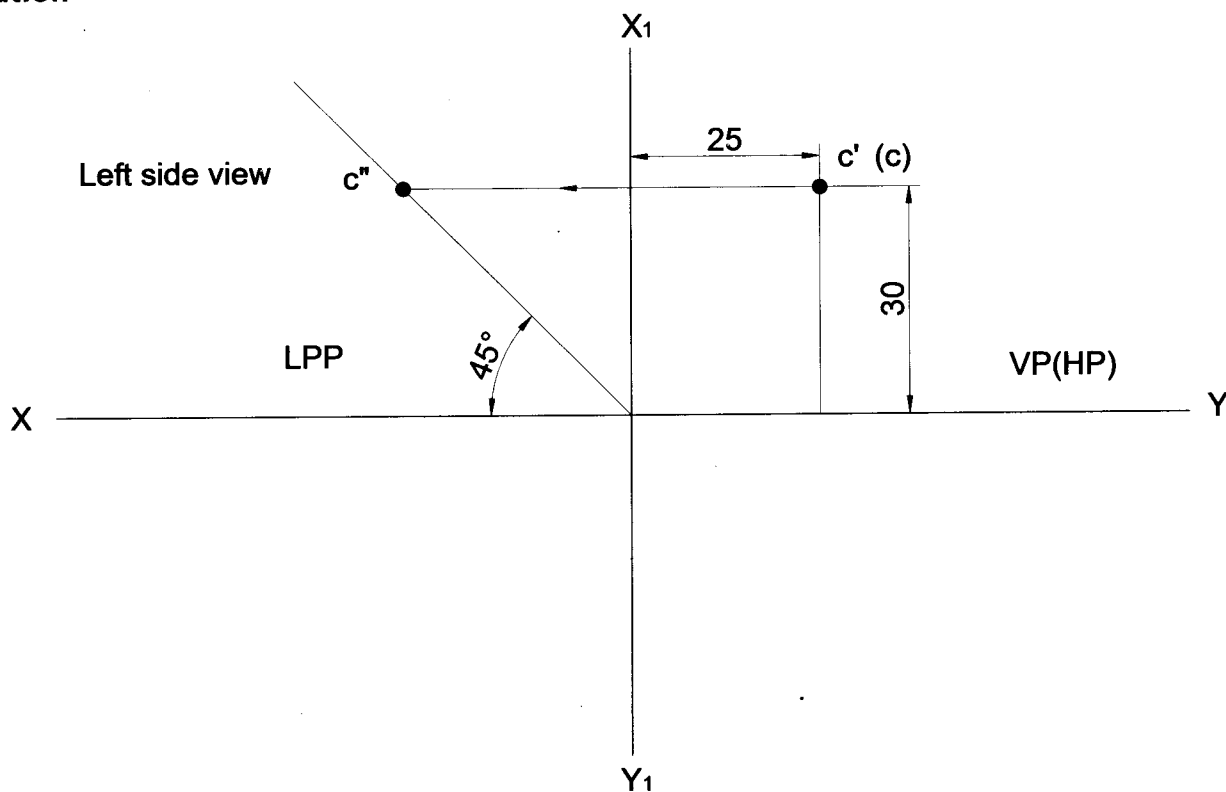
**Problem 19** A point is 40 mm behind VP, 15 mm above HP and 25 mm in front / behind / from LPP. Draw its projections and name the side view.

**Solution**



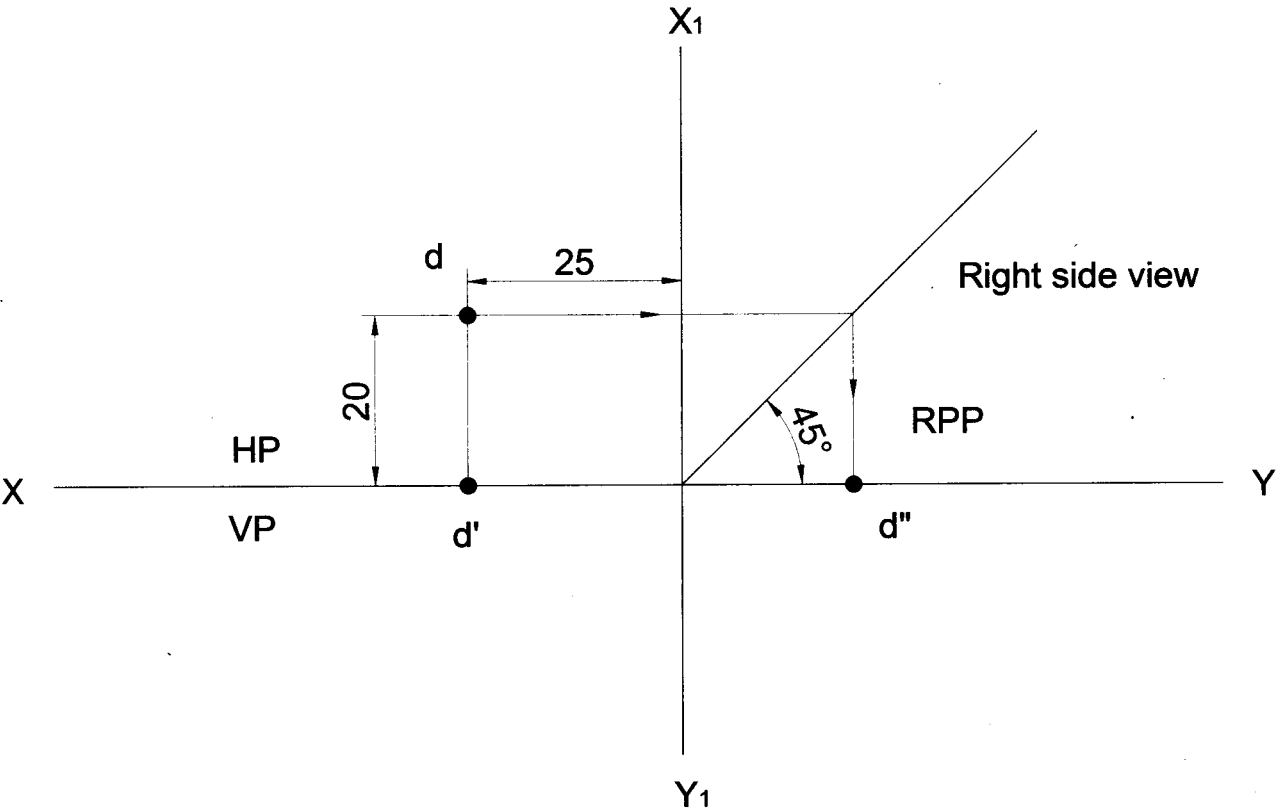
**Problem 20** A point is 30 mm behind VP, 30 mm above HP and 25 mm in front / behind / from LPP. Draw its projections and name the side view.

**Solution**



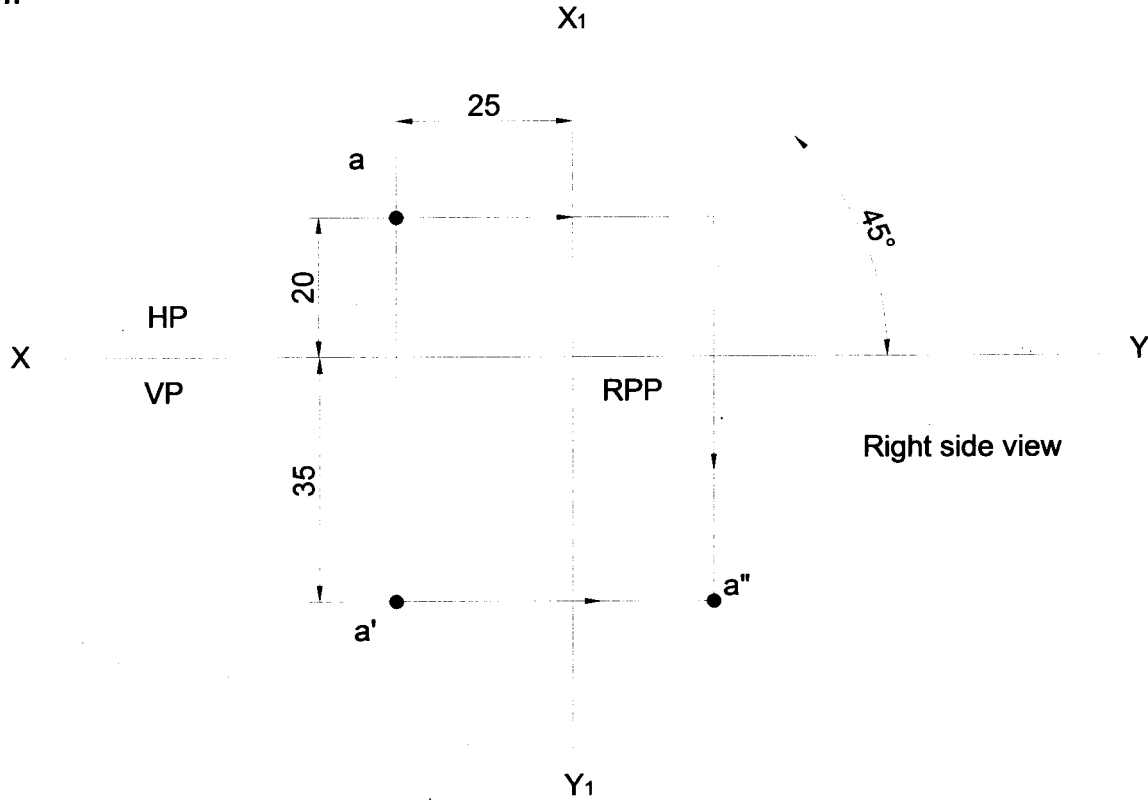
**Problem 21** A point is lying on HP, 20 mm behind VP & 25 mm behind / in front / from RPP. Draw its projections and name the side view.

**Solution**



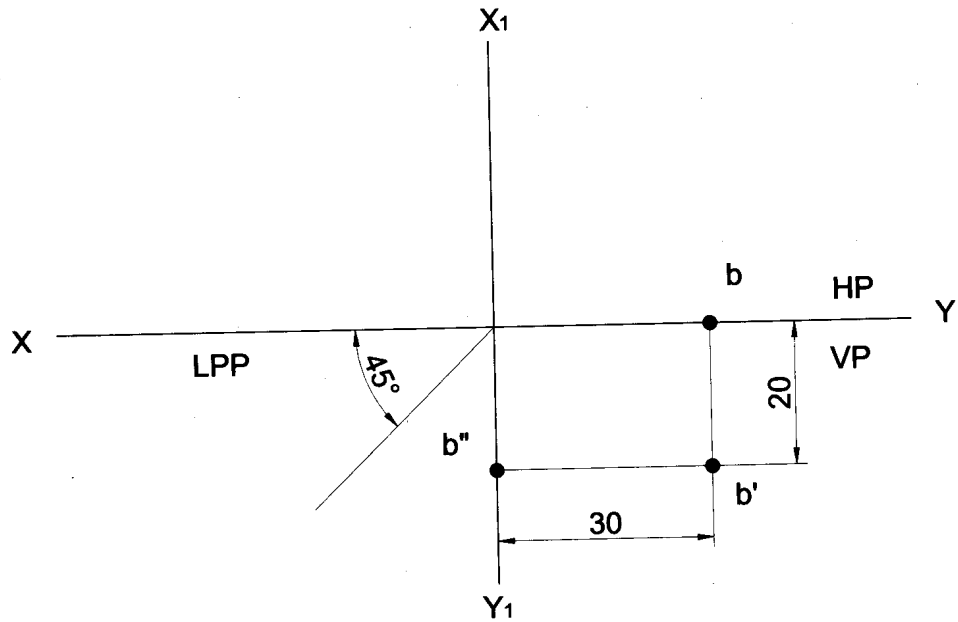
**Problem 22** A point is 35 mm below HP, 20 mm behind VP & 25 mm behind / in front / from RPP. Draw its projections and name the side view.

**Solution**



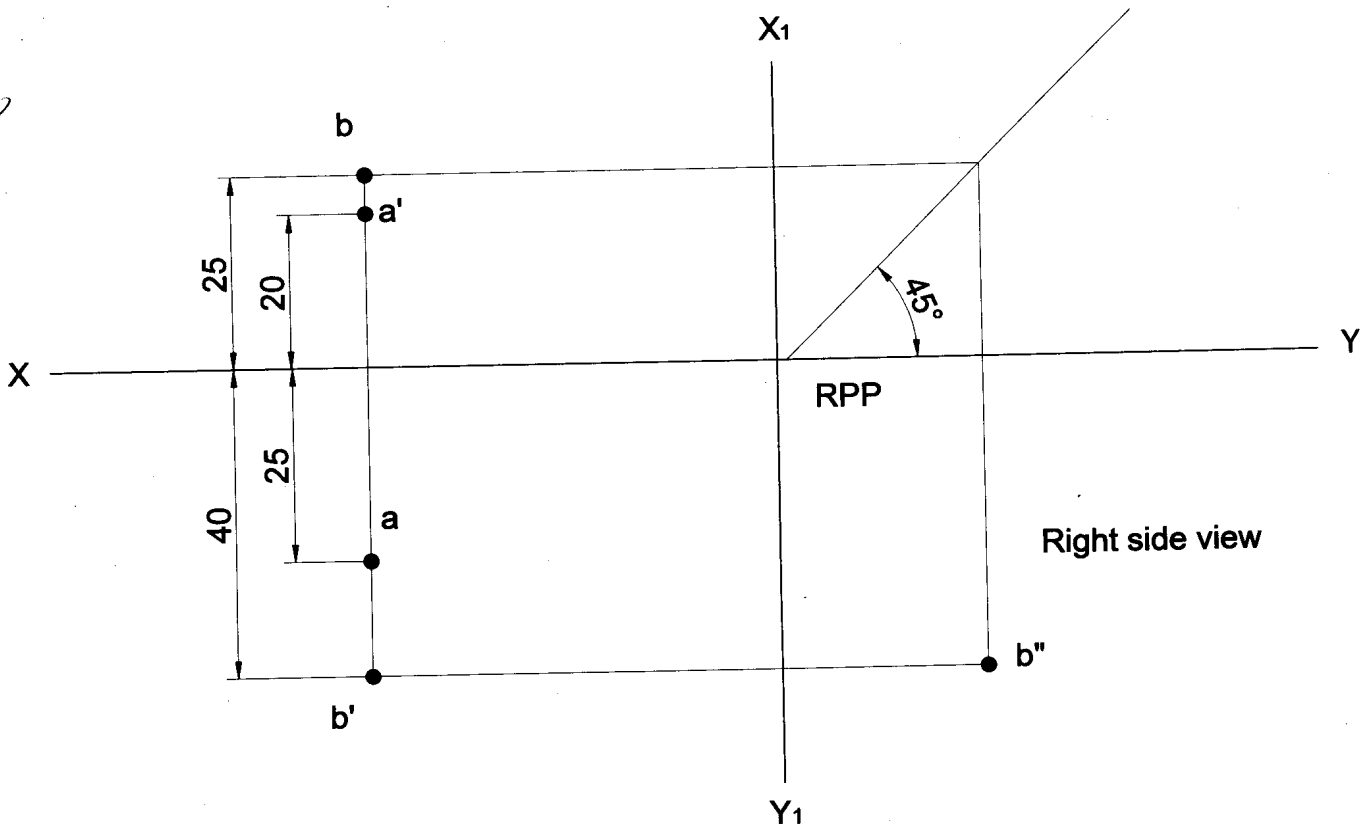
**Problem 23** A point is lying on VP, 20 mm below HP & 30 mm behind / in front / from LPP. Draw its projections and name the side view.

**Solution**



**Problem 24** A point A is 20 mm above HP & 25 mm in front of VP. Another point B is 25 mm behind VP and 40 mm below HP. Draw their projections when the distance between their projectors parallel to  $XY$  line is zero mm. Add the right side view only to point B.

**Solution**



**Problem 25** Draw the projections of the following Points on the same XY line, keeping convenient distance between each projectors. Name the Quadrants in which they lie.

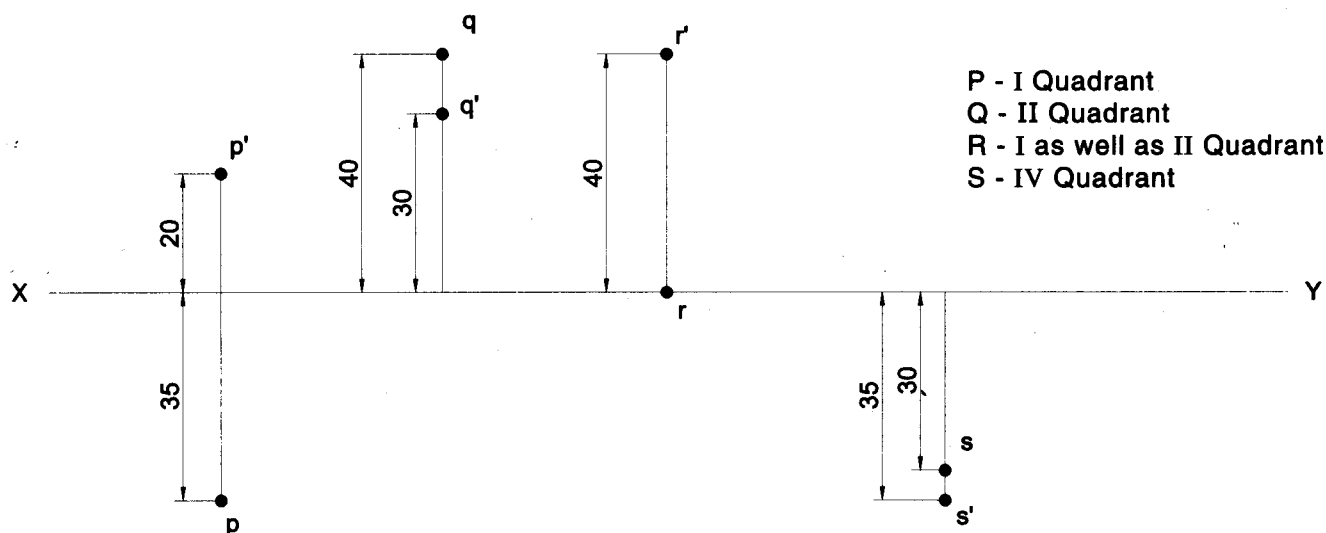
P – 20 mm above HP & 35 mm in front of VP.

Q – 30 mm above HP & 40 mm behind VP.

R – 40 mm above HP & on VP.

S – 35 mm below HP & 30 mm in front of VP.

**Solution**



**Problem 26** Draw the projections of the following Points on the same XY line, Keeping convenient distance between each projectors. Name the Quadrants in which they lie.

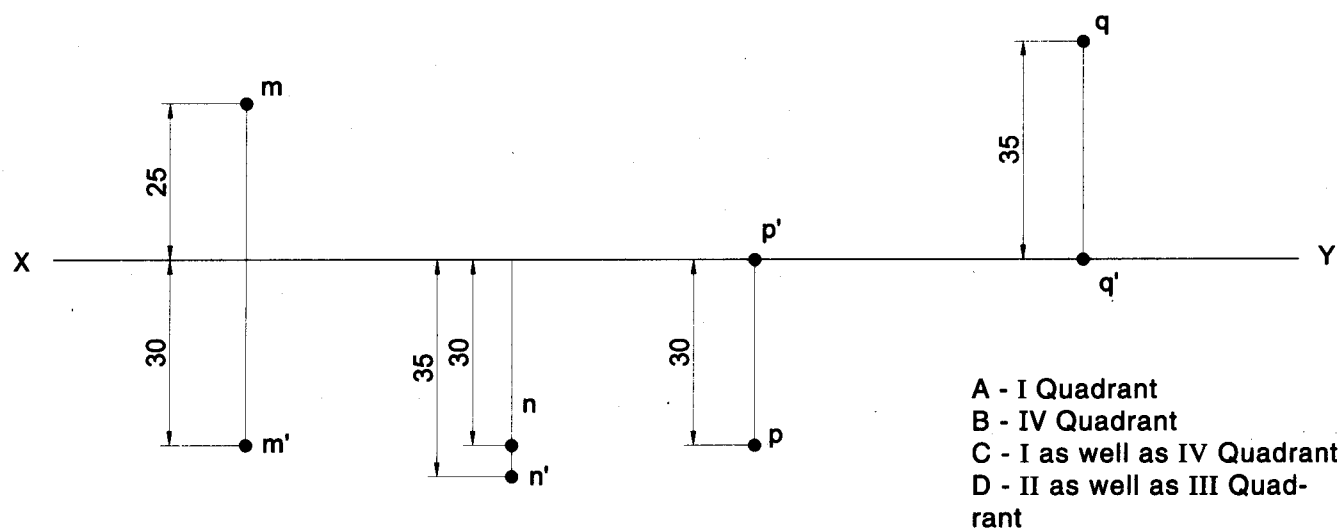
M – 30 mm below HP & 25 mm behind VP.

N – 35 mm below HP & 30 mm in front of VP.

P – on HP & 30 mm in front of VP.

Q – on HP & 35 mm behind of VP.

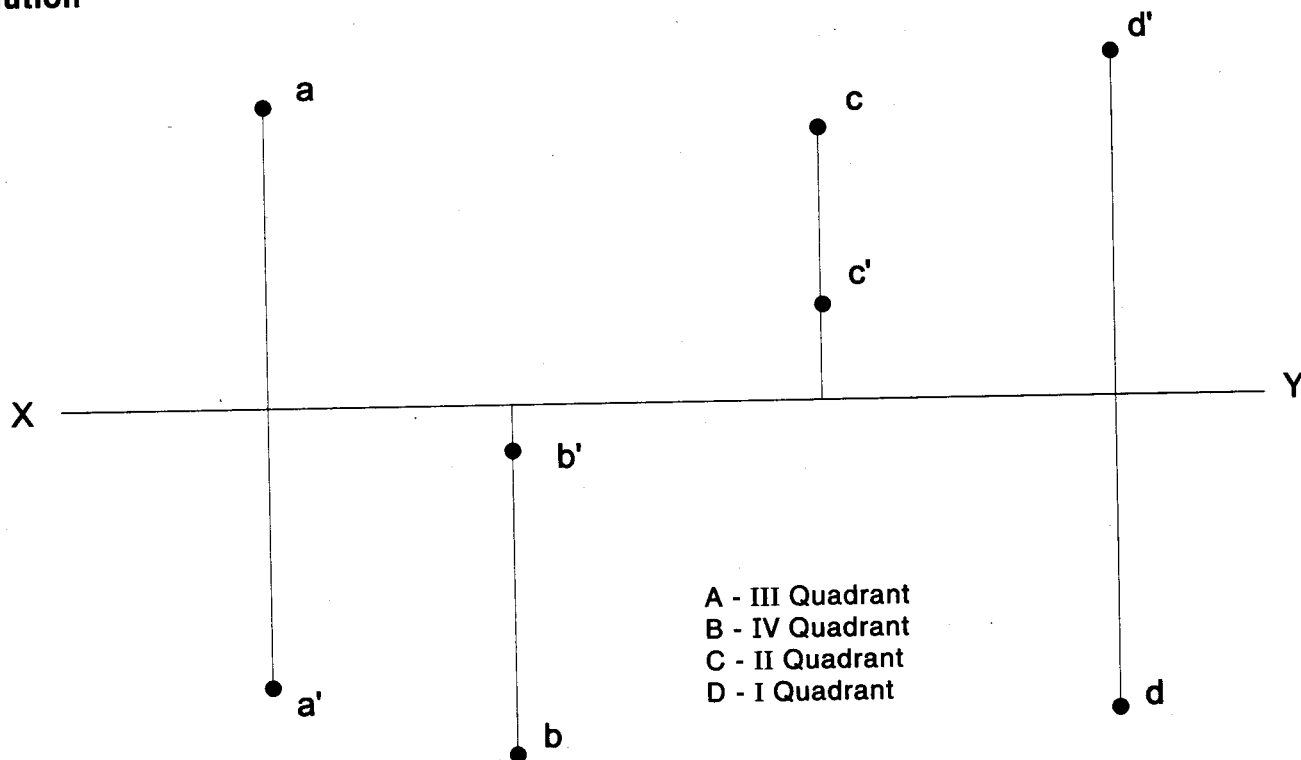
**Solution**



**Problem 27** State the quadrants in which the following Points are located. Assume any distances

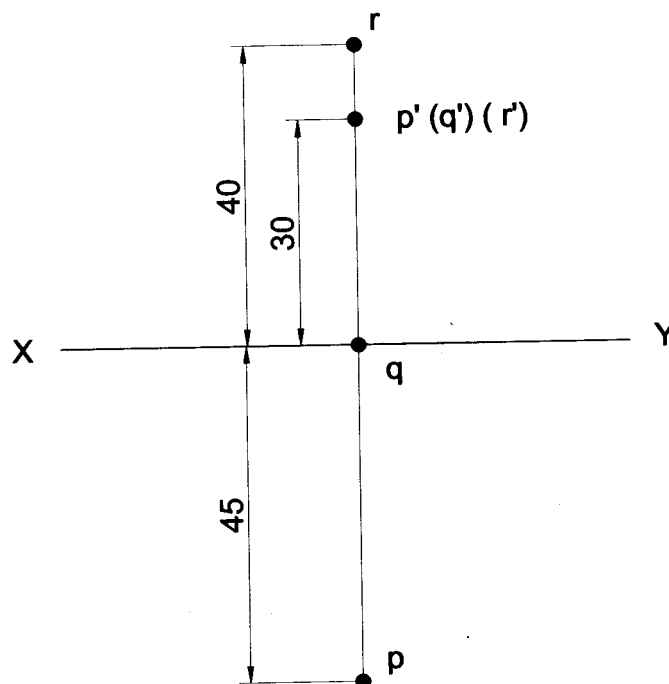
- A – Front view below XY & top view above XY line.
- B – Front and top views are below XY line.
- C – Front and top views are above XY line.
- D – Front view above XY & top view below XY line.

**Solution**



**Problem 28** A point 30 mm above XY line is the front view of three points P, Q and R. The top view of R is 40 mm behind VP, the top view of Q is on XY line and top view of point P is 45 mm in front of VP. Draw the projections of the points & state the quadrants in which the points are situated.

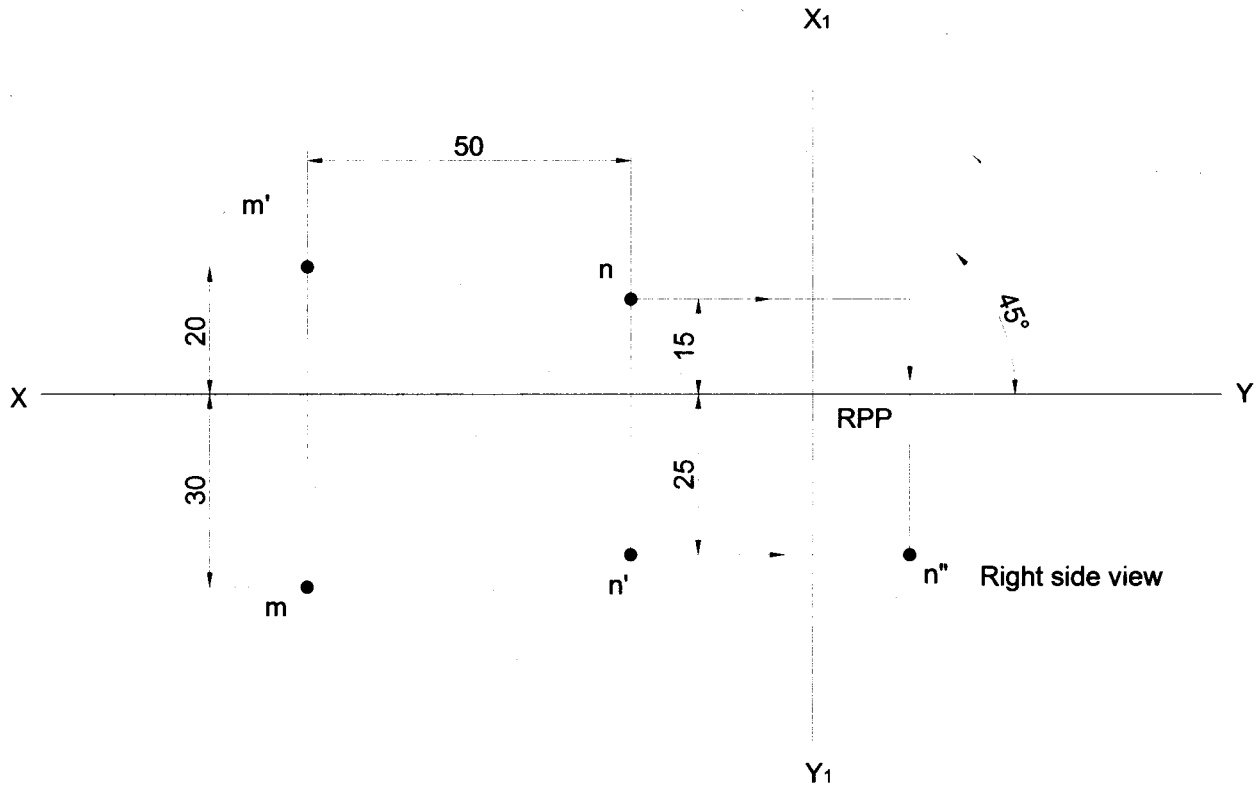
**Solution**



- P - I Quadrant
- Q - I as well as II Quadrant
- R - II Quadrant

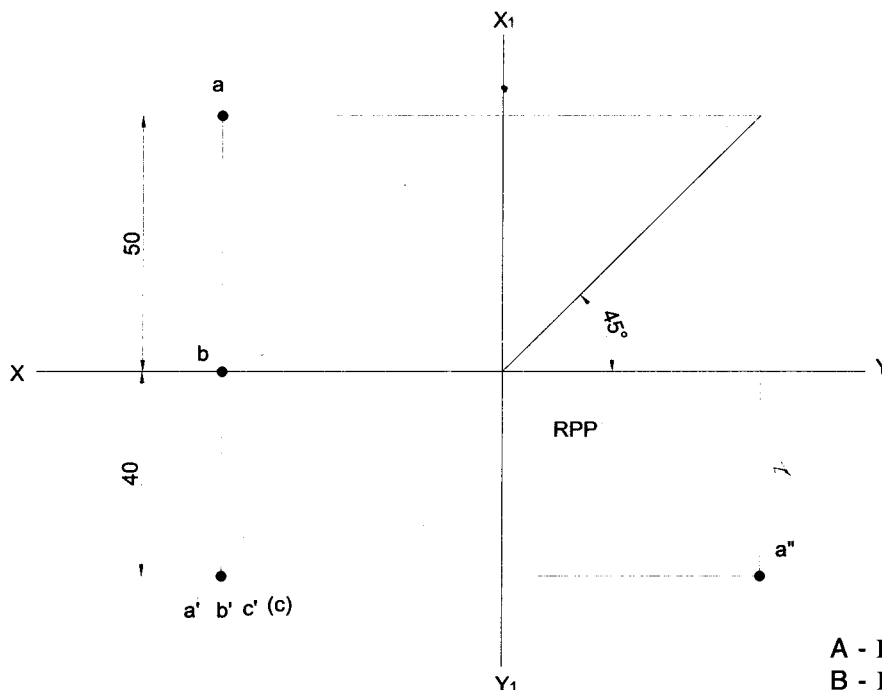
**Problem 29** A point 'M' is 30 mm in front of VP and 20 mm above HP. another point N in 15 mm behind VP & 25mm below HP. The horizontal distance between the points parallel to XY line is 50 mm . Draw the projections of the points M & N and Join their front and top views. Draw the right side view for the point N only.

**Solution**



**Problem 30** The common point 40 mm below XY line represents not only the front views of three points A, B and C but also the top view of point C. The top view of point B is lies on XY line and top view of point A lies 50 mm above it. Draw the projections of the points and add the right side view to the point A only. Also state in which quadrants the points lie.

**Solution**

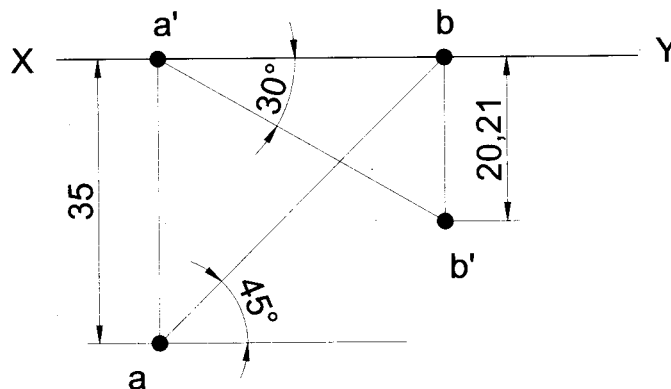


A - III Quadrant  
B - III as well as IV Quadrant  
C - IV Quadrant



**Problem 31** A point A is on HP and 35 mm in front of VP. Another Point B is on VP and below HP. The line joining their front views makes an angle of 30 deg to XY line while the line joining their top views makes an angle 45 deg with XY line. Find the distance of the point B from HP.

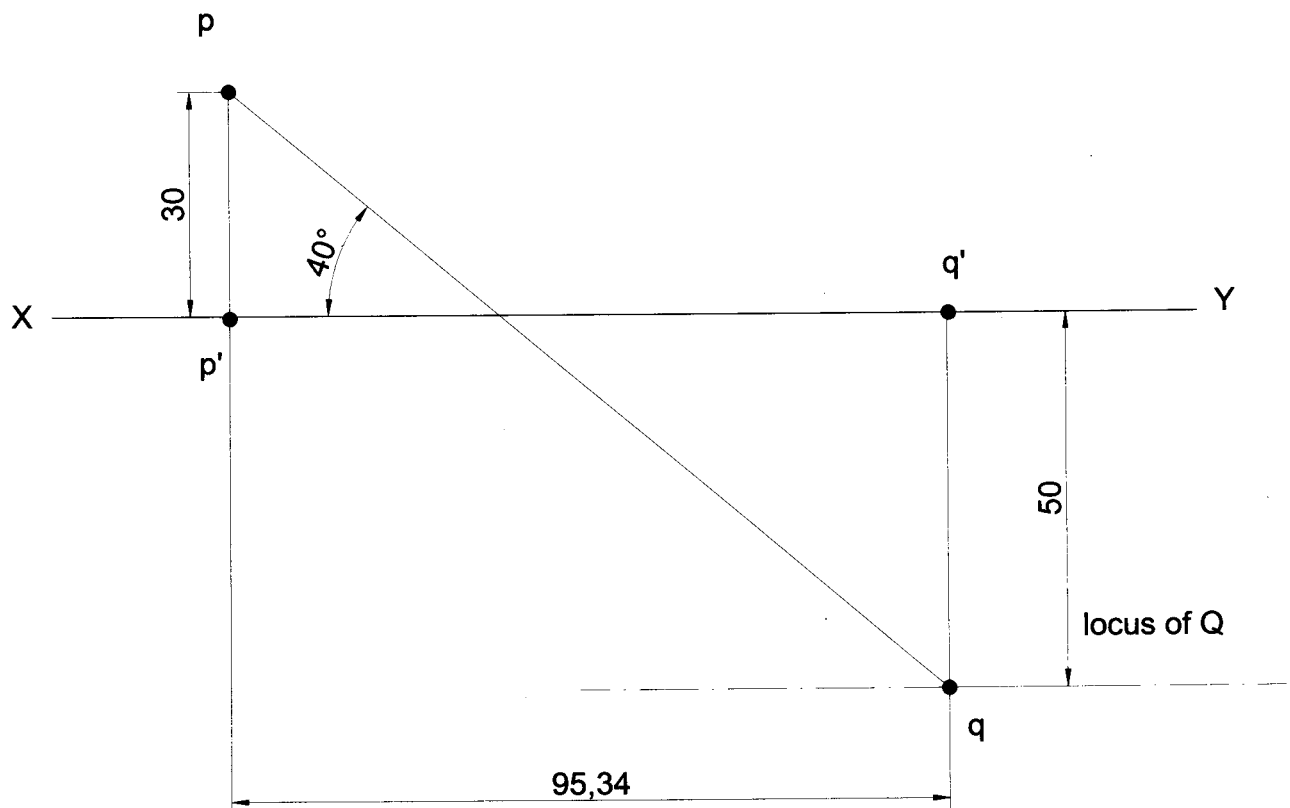
**Solution**



Point B is 20.21 mm below HP

**Problem 32** Two Points P and Q are on HP. The point P is 30 mm behind VP, while Q is 50 mm in front of VP. The line joining their top views makes an angle of 40deg with XY. Find the horizontal distance between their projectors parallel to XY line.

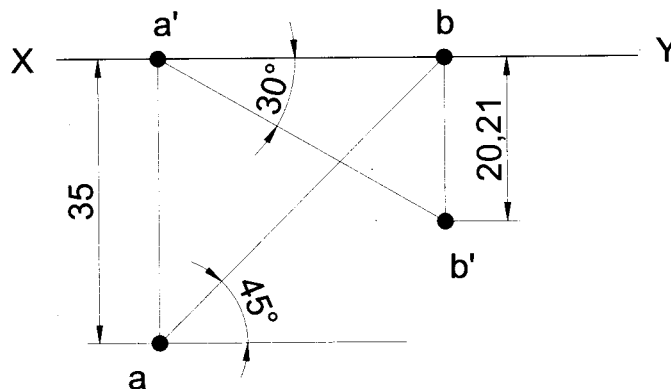
**Solution**



Distance Between Two Projector is 95.34 mm

**Problem 31** A point A is on HP and 35 mm in front of VP. Another Point B is on VP and below HP. The line joining their front views makes an angle of 30 deg to XY line while the line joining their top views makes an angle 45 deg with XY line. Find the distance of the point B from HP.

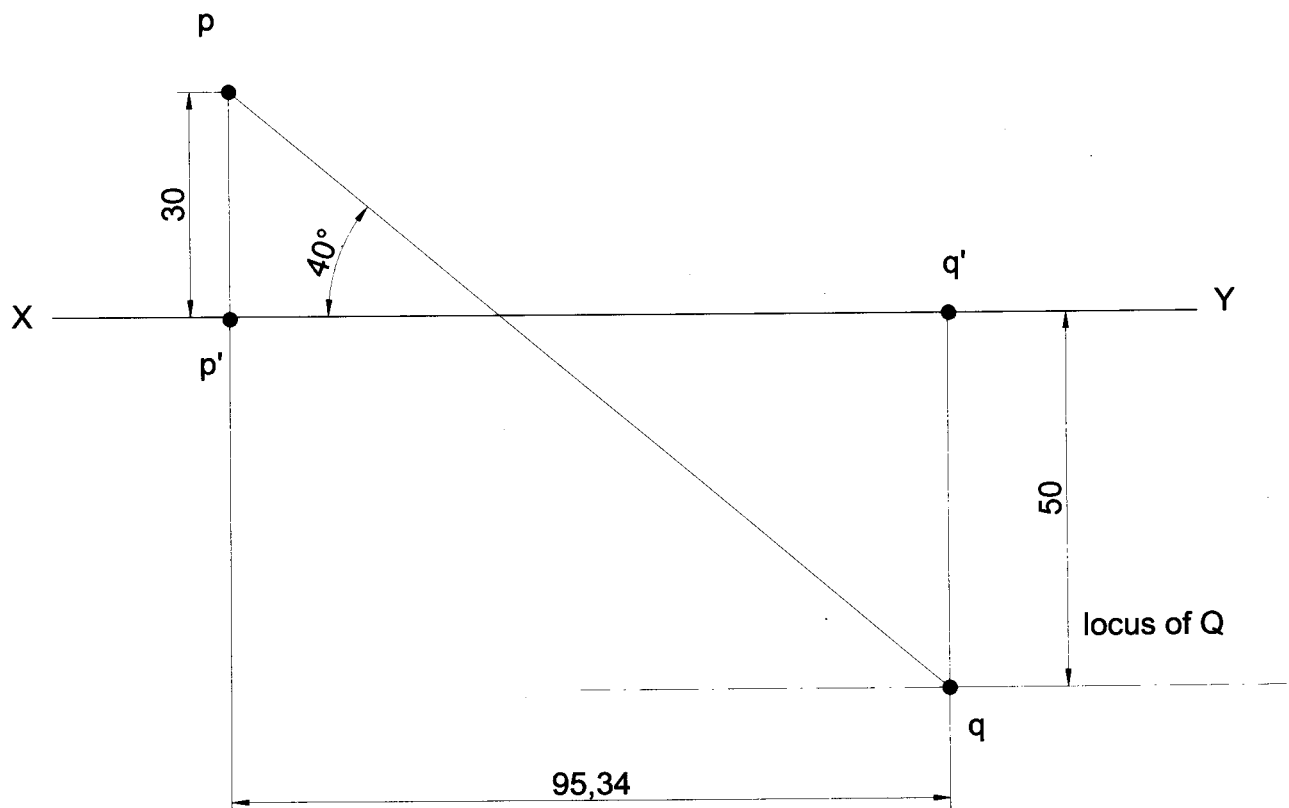
**Solution**



Point B is 20.21 mm below HP

**Problem 32** Two Points P and Q are on HP. The point P is 30 mm behind VP, while Q is 50 mm in front of VP. The line joining their top views makes an angle of 40deg with XY. Find the horizontal distance between their projectors parallel to XY line.

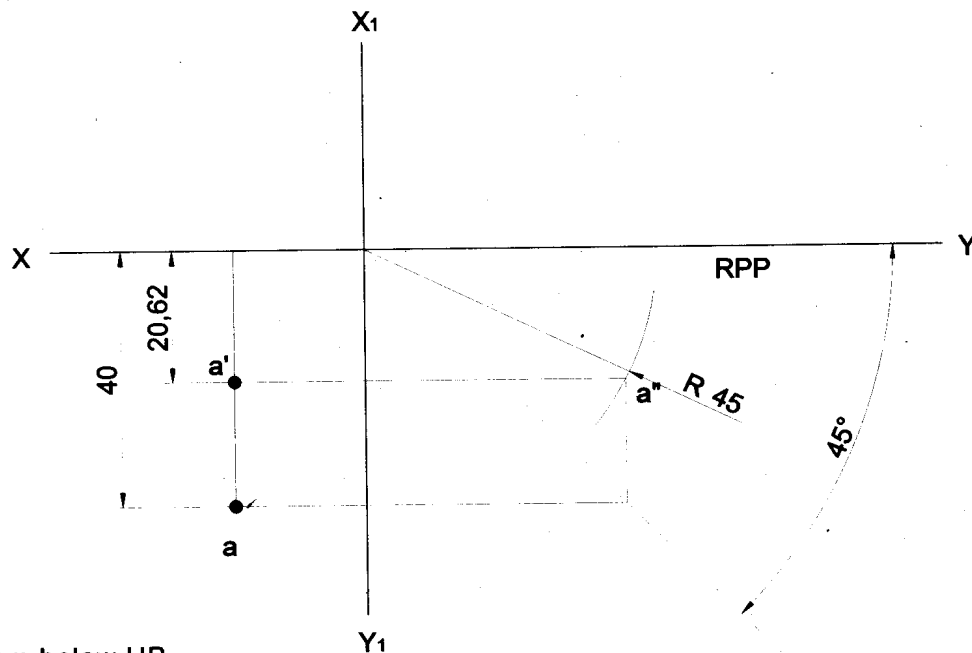
**Solution**



Distance Between Two Projector is 95.34 mm

**Problem 33** A point A is 40 mm in front of VP and is situated in the fourth quadrant. its shortest distance from the intersection of XY and X<sub>1</sub>Y<sub>1</sub> is 45 mm . Draw its projections. Also find its distance from HP.

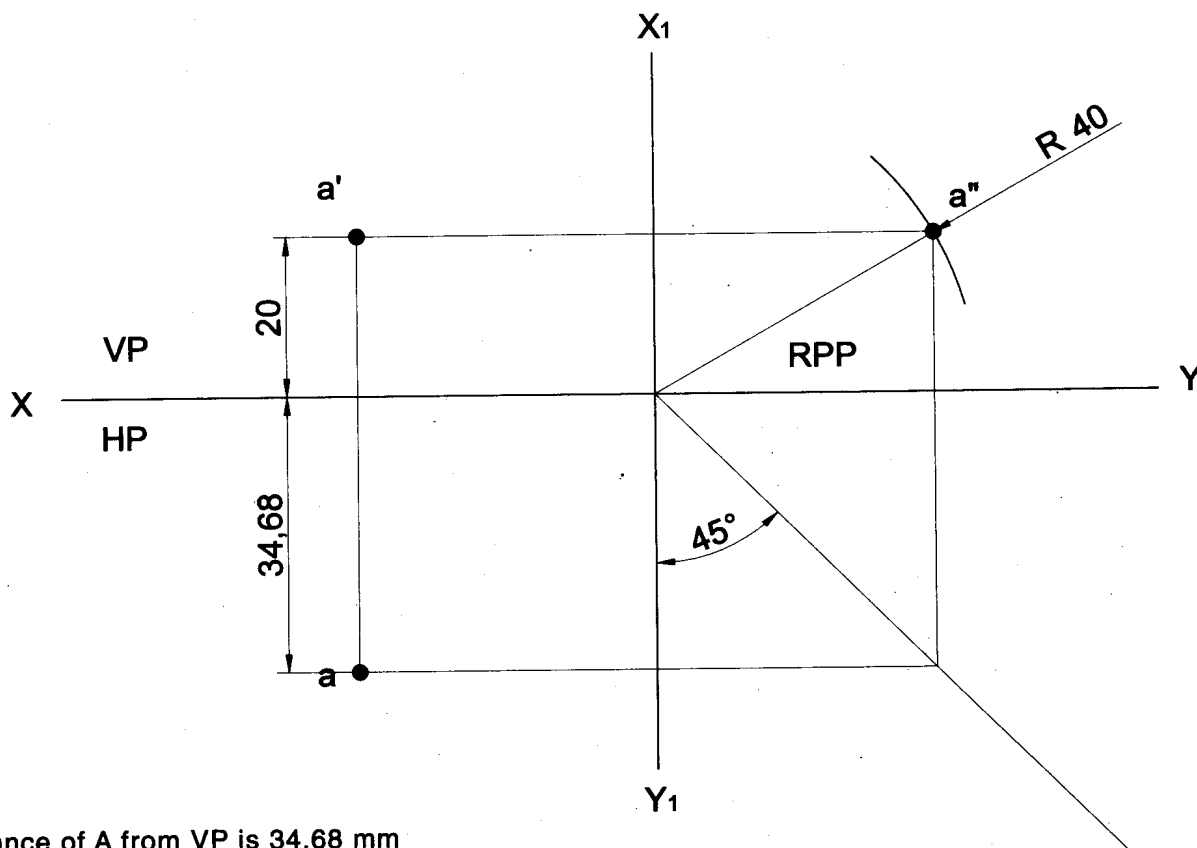
**Solution**



Point A is 20.62 mm below HP

**Problem 34** A point A is 20 mm above HP and in the first quadrant. Its shortest distance from the XY line is 40 mm .Draw the projections. Determine its distance from VP.

**Solution**



Distance of A from VP is 34.68 mm

**Problem 35** Draw the projections of the following Points on the same XY line, keeping convenient distance between each projectors and state the quadrants in which they lie.

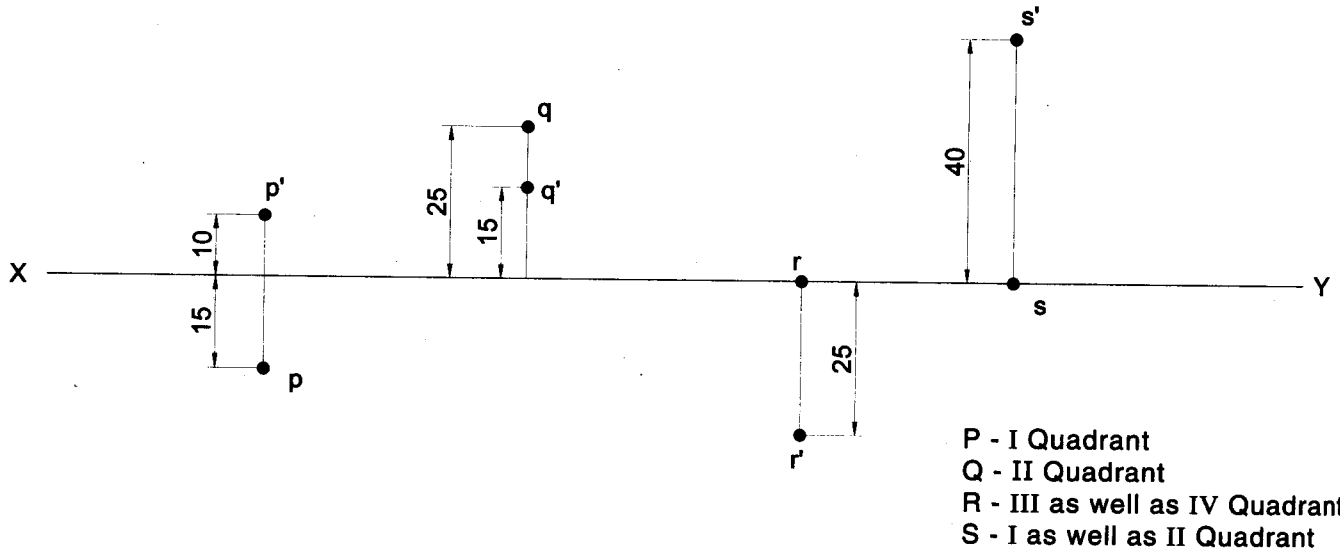
P – 10 mm above HP & 15 mm in front of VP.

Q – 15 mm above HP & 25 mm behind VP.

R – 25 mm below HP & in VP.

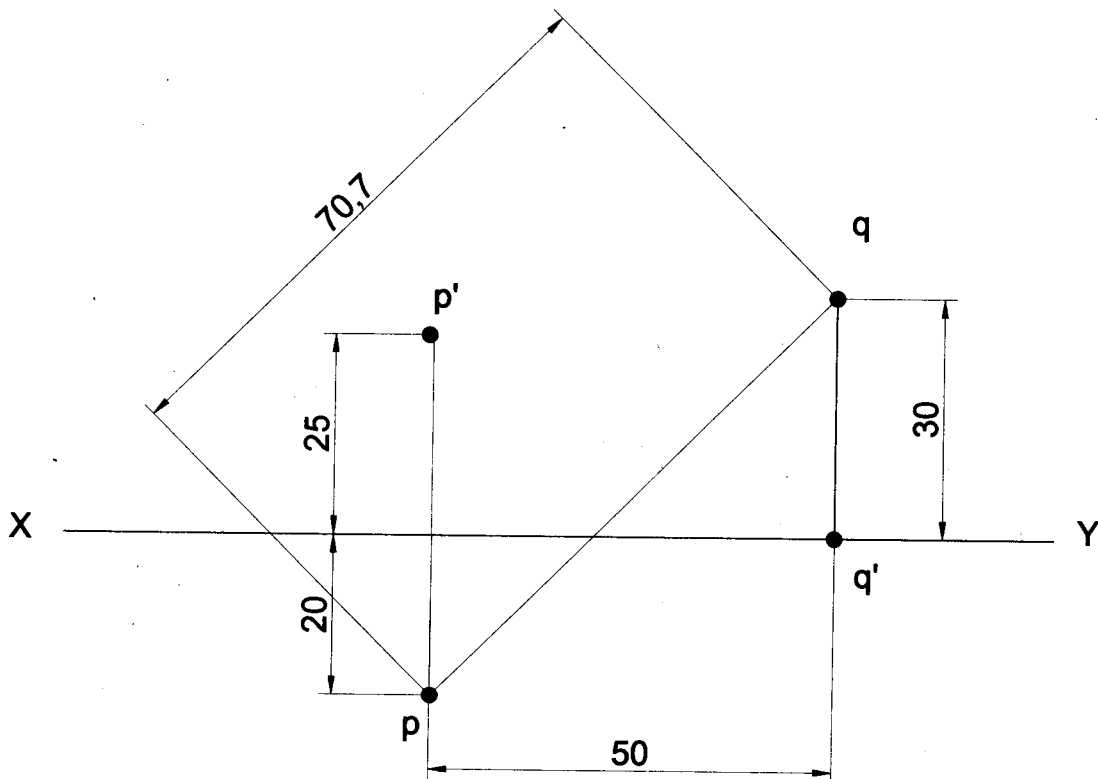
S – 40 mm above HP & in VP.

**Solution**



**Problem 36** A point P is 25 mm above HP & 20 mm in front of VP. Another point Q is on HP and 30 mm behind VP. The distance between their projectors measured parallel to the line of intersection of VP and HP is 50mm. Find the distance between the top views of points P and Q.

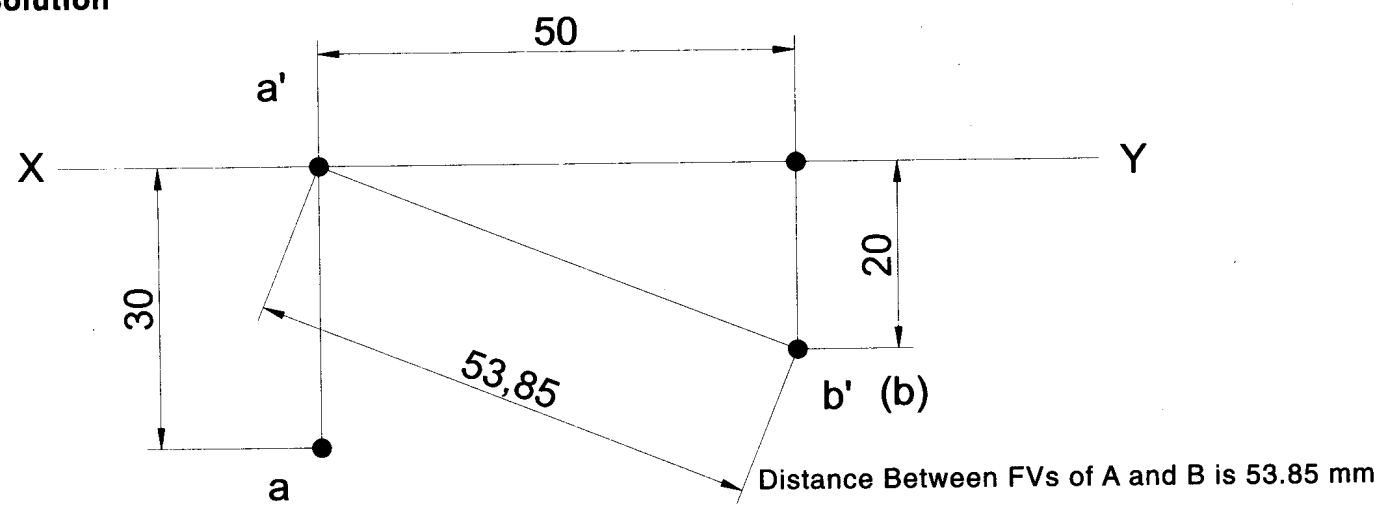
**Solution**



Distance Between TVs of P and Q is 70.7 mm

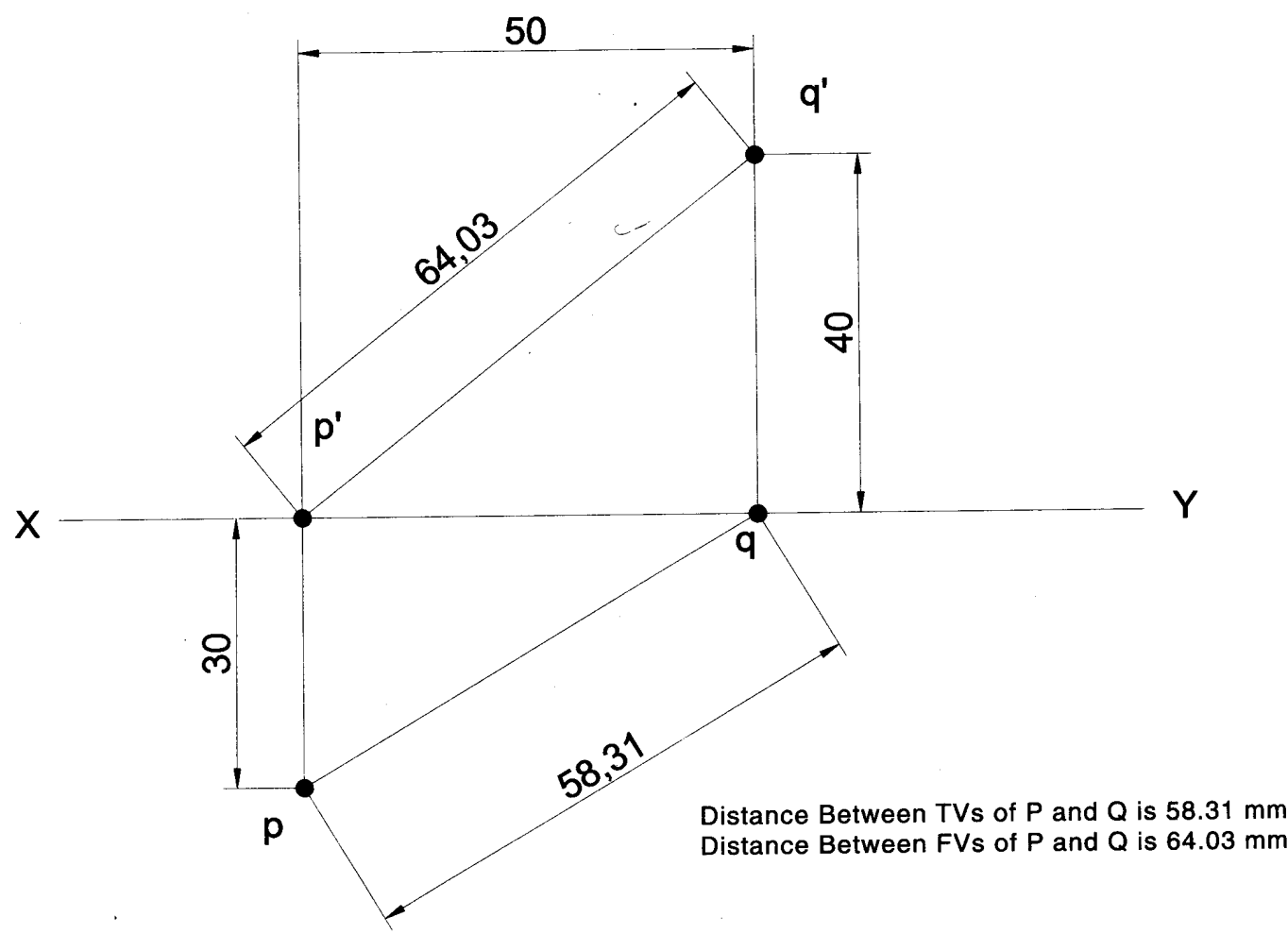
**Problem 37** A point A is on HP & 30 mm in front of VP. Another point B is 20 mm below HP and 20 mm in front of VP. The distance between their projectors measured parallel to XY line is 50 mm. Find the distance between the front views of the points A & B.

**Solution**



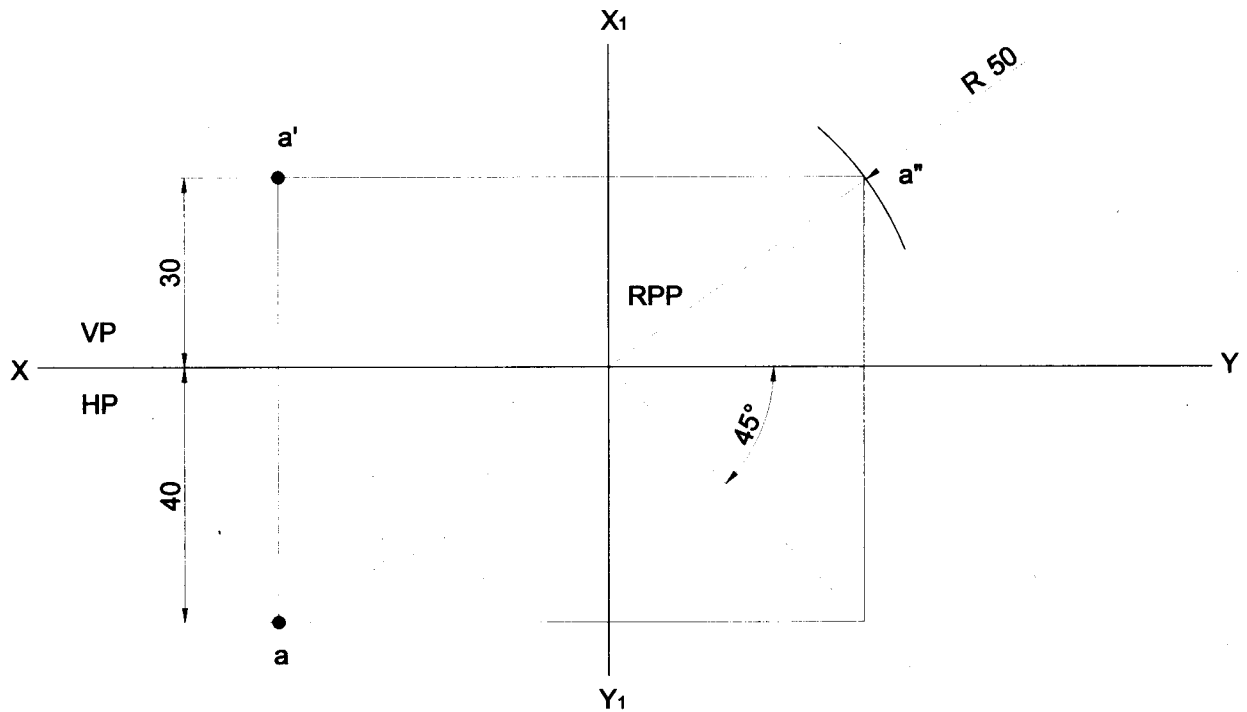
**Problem 38** A point P is on HP and 30 mm in front of VP. Another point Q is on VP and 40 mm above HP. The distance between their projectors parallel to XY line is 50mm. Find the distance between their front and top views of the points P and Q.

**Solution**



**Problem 39** Draw the projections of a point A lying 30 mm above HP and in first quadrant, if its shortest distance from the line of intersection of HP and VP is 50 mm. Also find the distance of the point from VP.

**Solution**



Distance of A from VP is 40 mm

**Problem 40** Draw the projections of the following points on the same reference XY line and state the quadrants in which they lie.

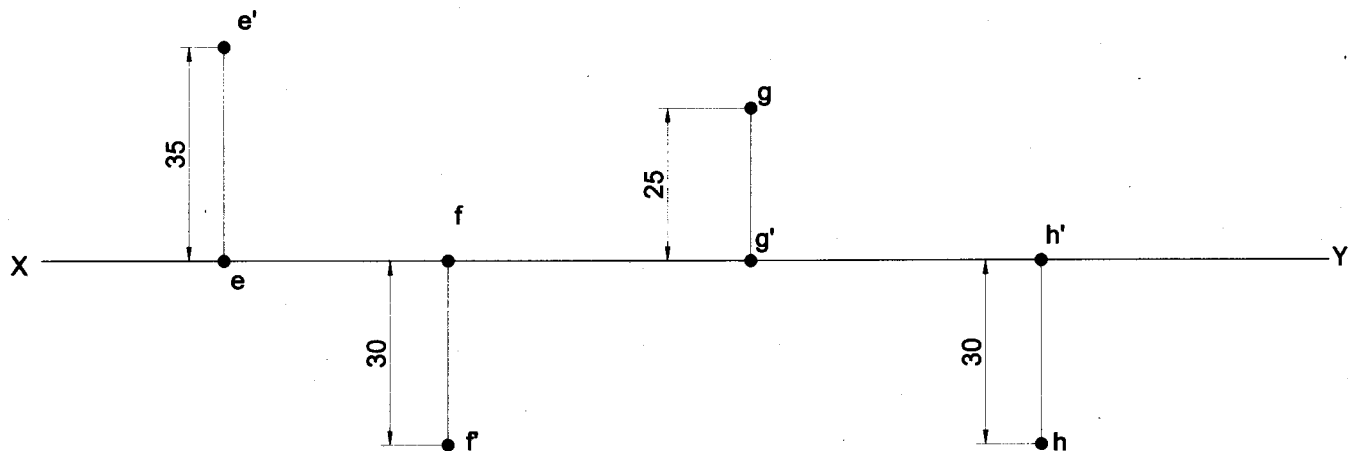
E – 35 mm above HP & on VP

F – 30 mm below HP & on VP

G – On HP & 25 mm behind VP

H – On HP & 30 mm in front of VP

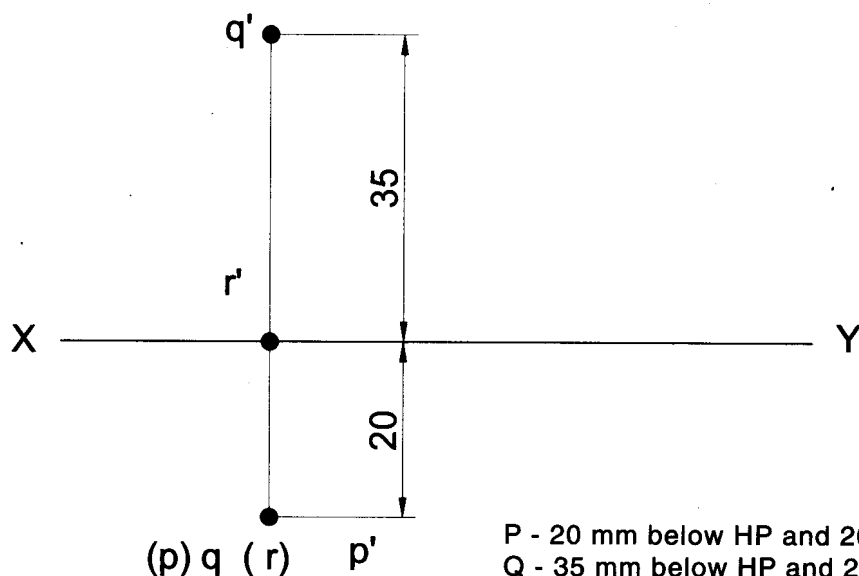
**Solution**



E - I as well as II Quadrant  
F - III as well as IV Quadrant  
G - II as well as III Quadrant  
H - I as well as IV Quadrant

**Problem 41** A point 20 mm below the reference XY line is the top view of three points P, Q & R. P is 20 mm below HP, Q is 35 mm above HP and R is on HP. Draw the projections of the three points and state their positions & quadrants in which they are situated.

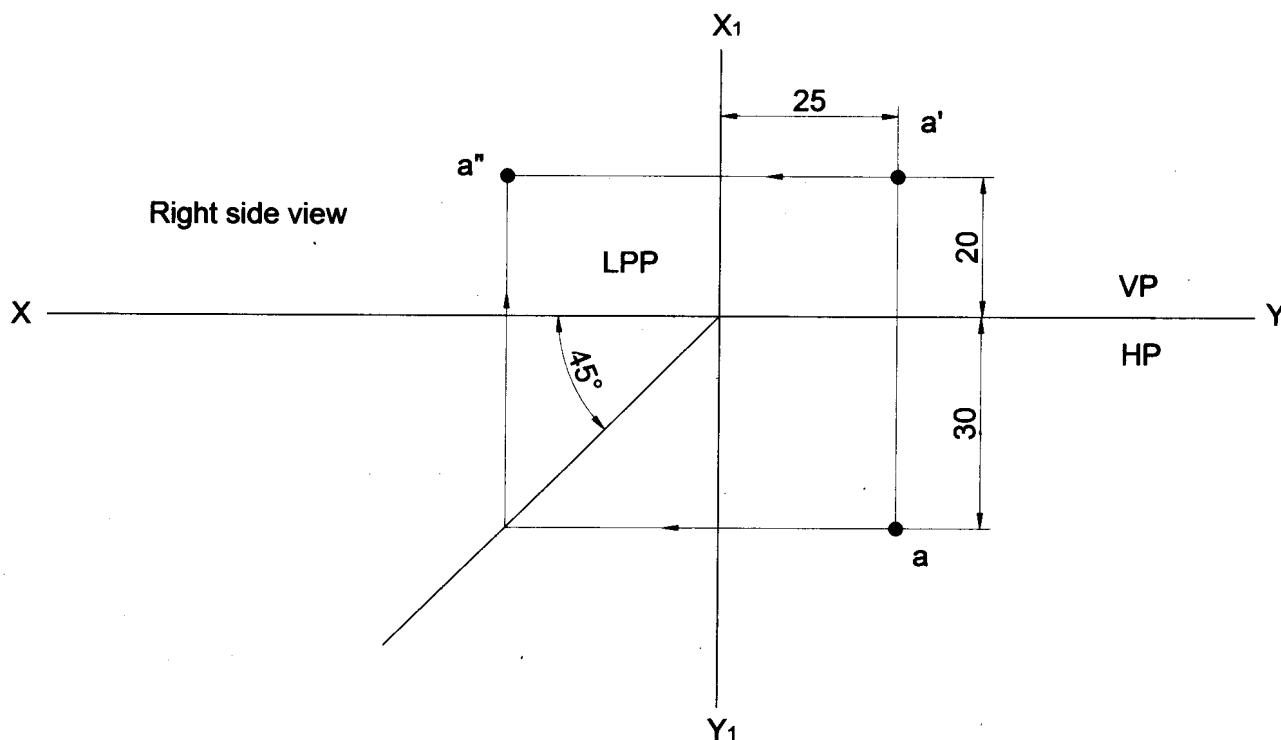
**Solution**



P - 20 mm below HP and 20 mm in front of VP, IV Quadrant  
 Q - 35 mm above HP and 20 mm in front of VP, I Quadrant  
 R - on HP and 20 mm in front of VP, as well as IV Quadrant

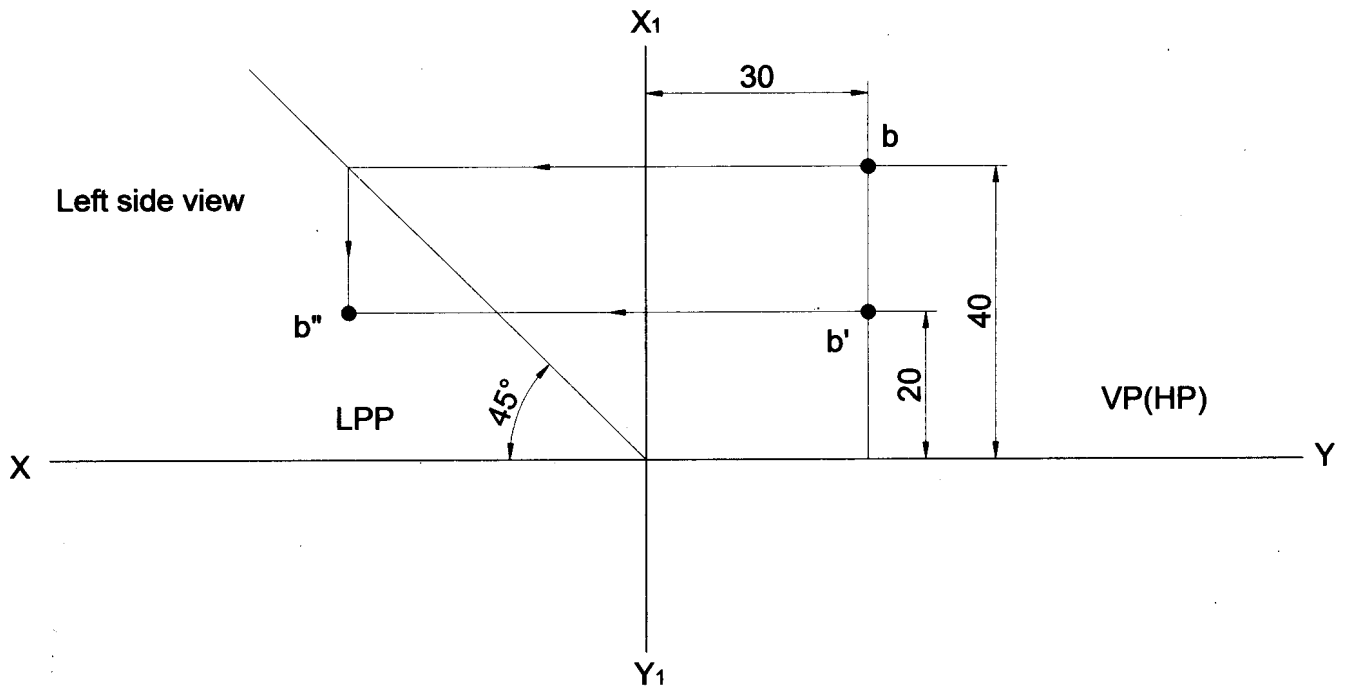
**Problem 42** A point is 30 mm in front of VP, 20 mm above HP & 25 mm in front / behind / from LPP. Draw its projections and name the side view.

**Solution**



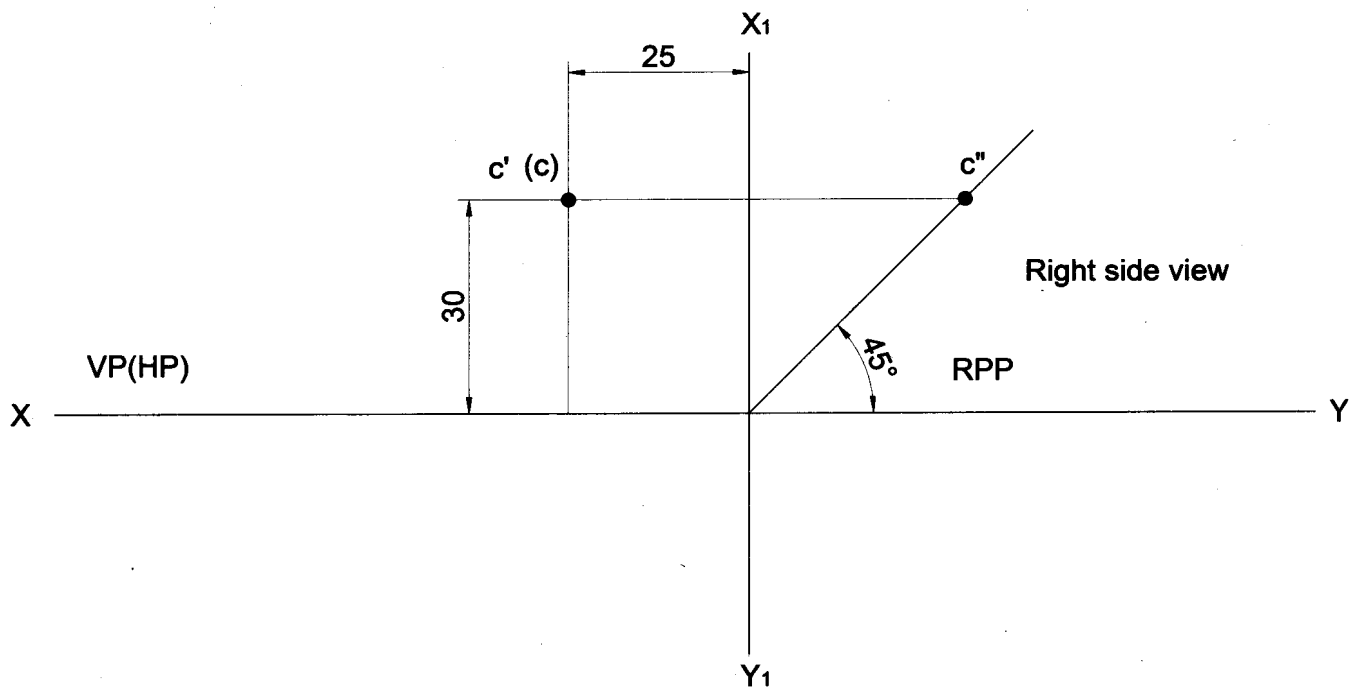
**Problem 43** A point is 40 mm behind VP, 20 mm above HP and 30 mm in front / behind / from LPP. Draw its projections and name the side view.

**Solution**



**Problem 44** A point is 30 mm behind VP, 30 mm above HP and 25 mm in front / behind / from RPP. Draw its projections and name the side views.

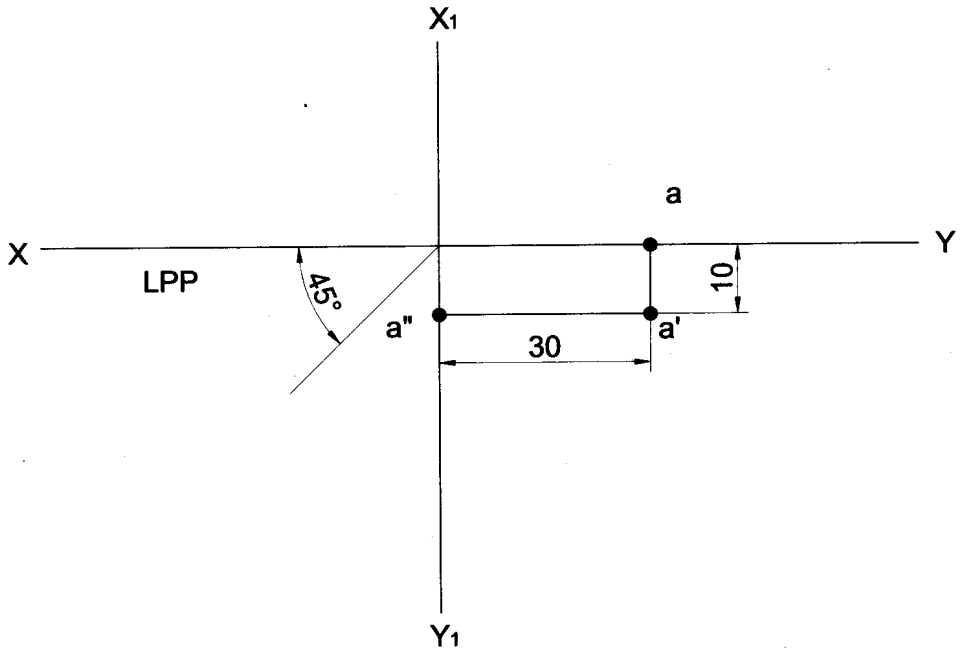
**Solution**





**Problem 45** A point is lying on VP, 10 mm below HP & 30 mm behind / in front / from LPP. Draw its projections and name the side view.

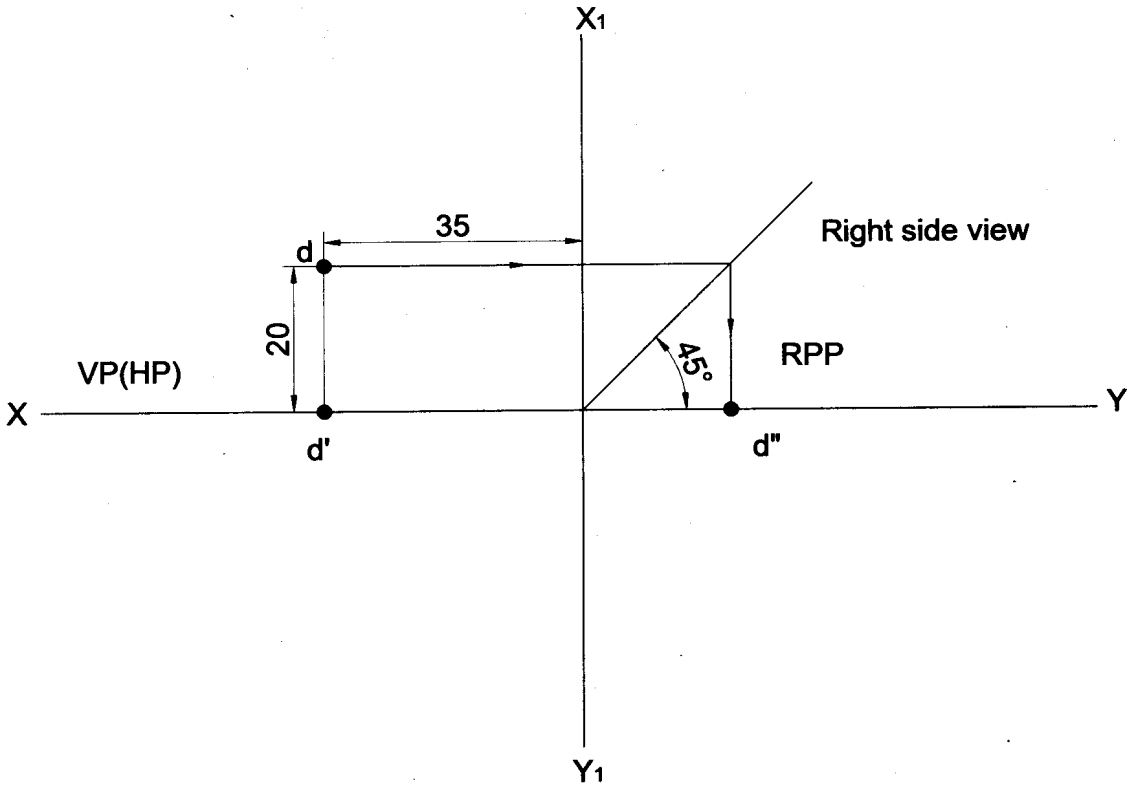
**Solution**



- Choice 1 : Treating the point is in III Quadrant, it is left side view
- Choice 2 : Treating the point is in IV Quadrant, it is right side view

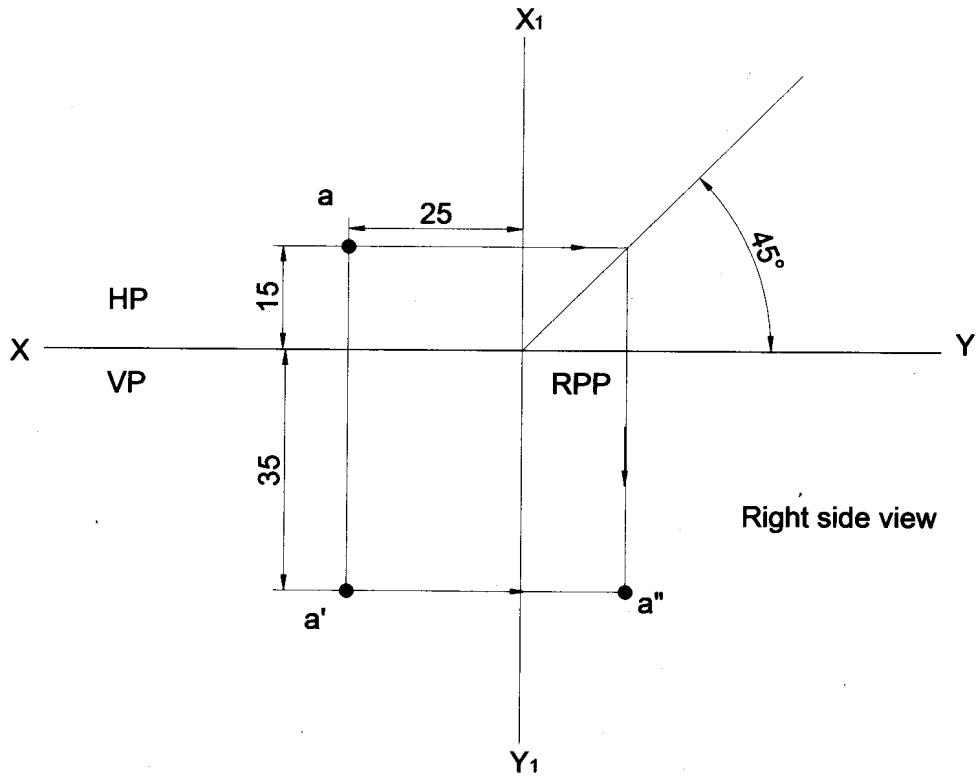
**Problem 46** A point is lying on HP, 20 mm behind VP & 35 mm behind / in front / from RPP. Draw its projections and name the side view.

**Solution**



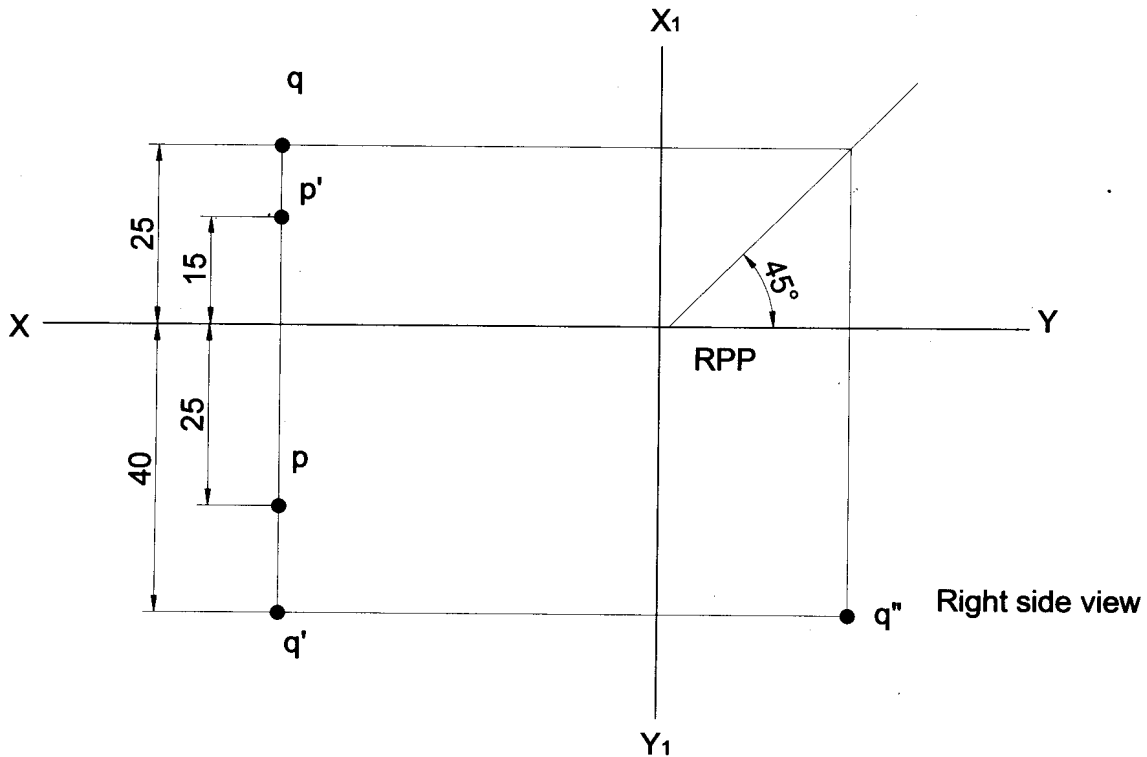
**Problem 47** A point is 35 mm below HP, 15 mm behind VP & 25 mm behind / in front / from RPP. Draw its projections and name the side view.

**Solution**



**Problem 48** A point P is 15 mm above HP & 25 mm in front of VP. Another point Q is 25 mm behind VP and 40 mm below HP. Draw their projections when the distance between their projectors parallel to XY line is zero mm. Add the right side view only to point Q.

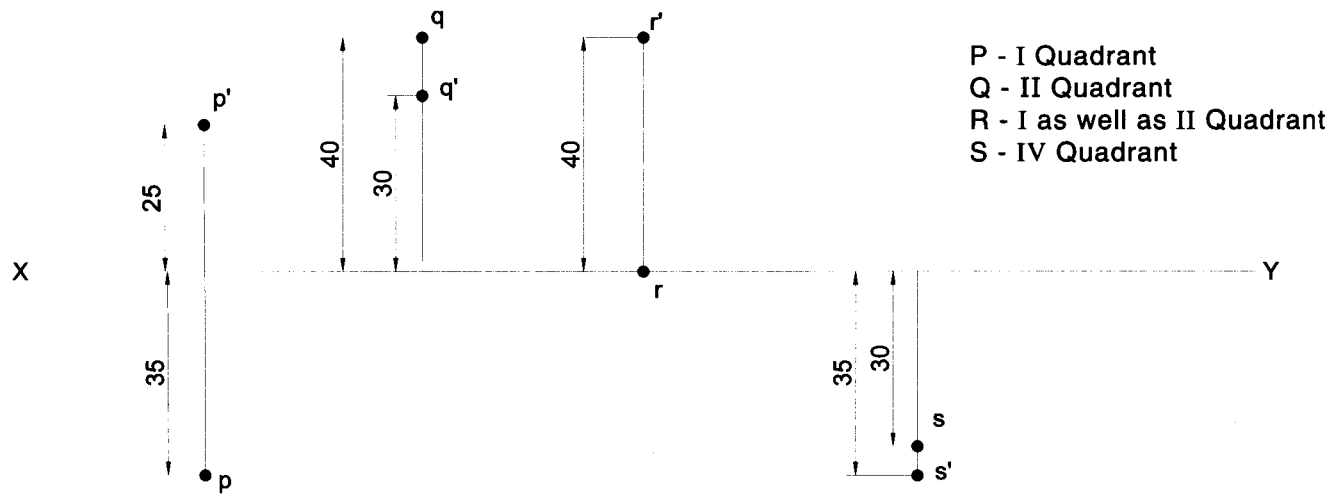
**Solution**



**Problem 49** Draw the projections of the following Points on the same XY line, keeping convenient distance between each projectors. Also state the quadrant in which they lie.

- P – 25 mm above HP & 35 mm in front of VP.
- Q – 30 mm above HP & 40 mm behind VP.
- R – 40 mm above HP & on VP.
- S – 35 mm below HP & 30 mm in front of VP.

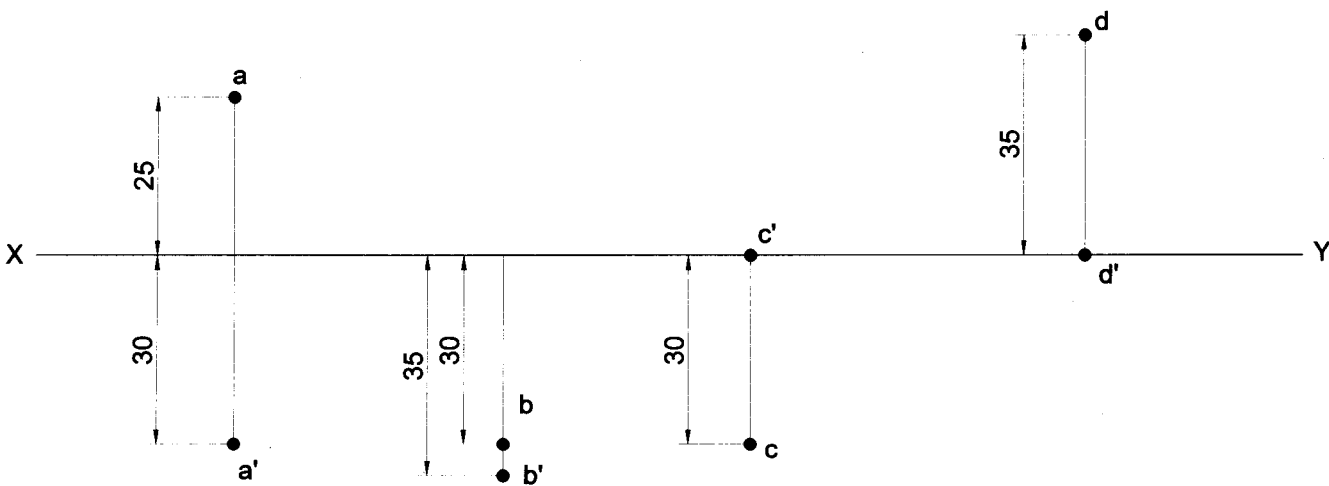
**Solution**



**Problem 50** Draw the projections of the following Points on the same XY line, Keeping convenient distance between the projectors. Also state the quadrants in which they lie .

- A – 30 mm below HP & 25 mm behind VP.
- B – 35 mm below HP & 30 mm in front of VP.
- C – on HP & 30 mm in front of VP.
- D – on HP & 35 mm behind of VP.

**Solution**



- A - III Quadrant
- B - IV Quadrant
- C - I as well as IV Quadrant
- D - II as well as III Quadrant

## CONTENTS

	PAGE No.
<i>Primer Committee</i>	I
<i>Foreword</i>	II
<i>Preface</i>	III
<i>Contents</i>	IV
<b>CHAPTER 1 : PROJECTIONS OF POINTS</b>	<b>1</b>
<b>CHAPTER 2 : PROJECTIONS STRAIGHT LINES</b>	<b>27</b>
<b>CHAPTER 3 : PROJECTIONS PLANE SURFACES</b>	<b>53</b>
<b>CHAPTER 4 : PROJECTIONS SOLIDS</b>	<b>77</b>
<b>CHAPTER 5 : DEVELOPMENT OF LATERAL SURFACES OF SOLIDS</b>	<b>125</b>
<b>CHAPTER 6 : ISOMETRIC PROJECTIONS</b>	<b>151</b>