Sheet 7: Projection of Points

1. Draw the projections of the following points on the same ground line keeping the projections 25mm apart
   (i) A is 20 mm above H.P. and 30 mm in front of V.P
   (ii) B is on H.P. and 30 mm in front of V.P.
   (iii) C is on V.P. and 35 mm above H.P
   (iv) D is 25 mm above H.P. and 35 mm behind V.P.
   (v) E is on H.P. and 40 mm behind V.P
   (vi) H is 35 mm below H.P. and 25 mm behind V.P.
   (vii) I is on V.P. and 30 mm below H.P.
   (viii) J is 30 mm below H.P. and 40 mm in front of V.P
   (ix) K is on both H.P. and V.P.

2. A point P is 50mm from the reference planes. Draw its projections in all possible positions.

3. State the quadrant in which the following points are situated.
   (a) A point P; its top view is 40 mm above xy; the front view , 20 mm below the top view.
   (b) A point Q, its projections coincide with each other 40 mm below xy.

4. A point P is 15 mm above the H.P. and 20 mm in front of the V.P. Another point Q is 25mm behind the V.P. and 40mm below the H.P. Draw the projections of P and Q keeping the distance between the end projectors equal to 90mm. Draw the straight lines joining (i) their top views and (ii) their front views.

5. Two points A and B are in the H.P. The point A is 30mm in front of V.P., while the point B is behind the V.P. The distance between their projectors is 75mm and the line joining their top views makes an angle of 45^0 with xy. Find the distance of the point B from the V.P.

Sheet 8: Projections of straight lines -1

(Parallel to one of the reference planes)

1. Draw the projections of 75mm straight line in the following positions.
   (a) Parallel to both H.P. and V.P. and 25 mm from each.
   (b) Parallel to and 30 mm above H.P and in the V.P.
   (c) Parallel to and 40 mm in front of V.P and in the H.P.
   (d) Perpendicular to the H.P., 20mm in front of V.P its one end is 15 mm above H.P.
   (e) Perpendicular to V.P., 25mm above the H.P., and its one end in the V.P.
   (f) Perpendicular to H.P., in the V.P., its one end in the H.P
   (g) Inclined 30^0 to the H.P. and its one end 20 mm above it; parallel to and 30 mm Infront of V.P.
   (h) Inclined 45^0 to the V.P., in the H.P. its one end in the V.P.
   (i) Inclined at 60^0 to V.P. and its one end 15 mm Infront of it. The line is parallel to and 25 mm above H.P.

2. A 70 mm long line is parallel to and 40 mm above H.P. Its two ends are 25 mm and 50 mm in front of V.P. respectively. Draw its projections and find the inclination with the V.P.

3. A 90 mm long line is parallel to and 25 mm in front of V.P. It's one end is in the H.P., while the other end is 50 mm above H.P. Draw its projections and find its inclination with the H.P.

4. The top view of a 75 mm long line measures 55 mm. The line is in the V.P., Its one end being 25 mm above the H.P. Draw its projections.

5. The front view of a line, inclined at 30^0 to the V.P is 65 mm long. Draw the projections of the line, when it is parallel to and 40 mm above the H.P., its one end being 30 mm in front of the V.P.

6. A vertical line AB, 75 mm long, has its end A in the H.P. and 25 mm in front of the V.P. A line AC, 100 mm long, is in the H.P and parallel to the V.P. Draw the projections of the line joining B and C and determine its inclination with the H.P.

7. Two pegs fixed on a wall are 4.5 m apart. The distance between the pegs measured parallel to the floor is 3.6 m. If one peg is 1.5 m above the floor, find the height of the second peg and the inclination of the line joining two pegs, with the floor.

Projection of straight lines 2

(Inclined to both the reference planes)

1. A line AB of length 70 mm is making an angle of 30^0 with the H.P. and 45^0 with the V.P. The end A is 15 mm above H.P. and 20 mm in front of V.P. Draw its projections.
2. The top view of a 75 mm long line AB measures 65 mm, while the length of its front view is 50 mm. It's one end A is in the H.P. and 12 mm infront of the V.P. Draw the projections of AB and determine its inclination with the H.P and the V.P.
3. A line AB, 65 mm long, has it's end A 20 mm above the H.P and 25 mm in front of the V.P. The end B is 40 mm above the H.P. and 65 mm in front of the V.P. Draw the projections of AB and show its inclinations with the H.P. and the V.P.
4. The end A of a line AB is 20 mm above the H.P and 25 mm infront of the V.P. The other end is 50mm above the H.P and 65 mm infront of the V.P. The distance between end projectors of the line is 70mm. Draw the projections of a line and determine its true length and true inclination with the H.P and the V.P.
5. A 75 mm long line PQ is inclined at an angle of 30^0 to the H.P. The end P is 20 mm above the H.P. and on the V.P. The end Q is 60 mm in front of the V.P. Draw the projections of the line.
6. A 90 mm long line PQ has its ends P and Q 10 mm and 60 mm above the H.P. respectively. The end projectors are 50 mm apart. The point P is 20 mm in front of the V.P. Draw the projections and find the angles with both the reference planes.
7. The mid-point of a straight line AB is 60 mm above H.P and 50 mm in front of V.P. The line measures 80 mm and inclined at $30^0$to H.P & $45^0$to V.P. Draw the projections.

Projection of straight lines – II: Additional Problems

(Inclined to both the planes)

1. A line AB, 90 mm long is inclined at 30^0 to the H.P. Its end A is 12 mm above the H.P. and 20 mm infront of the V.P. Its front view measures 65 mm. Draw the top view of AB and determine its inclination with the V.P. (p.10.17/220)

2. A line AB 90 mm long, is inclined at 45 to the H.P. and its top view makes an angle of 60 to the V.P. The end A is in the H.P. and 12 mm infront of the V.P. Draw its front view and its true inclination with the V.P. (p.10.14/218).

3. A line PQ of 75 mm long, has its end P in the V.P. and the end Q in the H.P. The line is inclined at 30^0 to H.P. and 60^0 to V.P. Draw the projections. (p.10.9/215)
   (Note: $\theta + \varphi <= 90^0$. When $\theta + \varphi = 90^0$, Line lies on a plane perpendicular to both H.P and V.P which is called profile plane. The F.V and T.V are both perpendicular to reference line.)

4. The projectors of the ends of a line AB are 50 mm apart. The end 'A' is 20 mm above the H.P. and 30 mm in front of the V.P. The end 'B' is 10 mm below the H.P and 40 mm behind the V.P. Determine true length and its inclinations with two planes. (p.10.13/217)

5. A point A is 50 mm below the H.P and 12 mm behind the V.P. A point B is 10 mm above the H.P and 25 mm infront of the V.P. The distance between the projectors of A and B is 40 mm. Determine true length and its inclinations with two planes. (p.10.7/213)