Lecture (3)

Representation of the Elevation, Plan, and Side View for a point: the position of a point does not determine exactly in space by using the Elevation and plan only because the point is on a parallel line to both planes the Vertical and horizontal (or to GL). To specify completely the position of point, it must be relied on a third dimension for the point, i.e., using a perpendicular plane to both the VP and HP called **Side Plane** to form three perpendicular planes that all of them get together at the same point which is named origin point. Any point in space can be specified if the three dimensions of the point are known from Vertical, Horizontal, and Side Planes. Figure (1) shows the pictorial representation for a point in space and its dimensions are x, y, and z.

x: the distance between the point and the Side Plane.

y: the distance between the point and the Vertical Plane.

z: the distance between the point and the Horizontal Plane.

K: a point in the space.

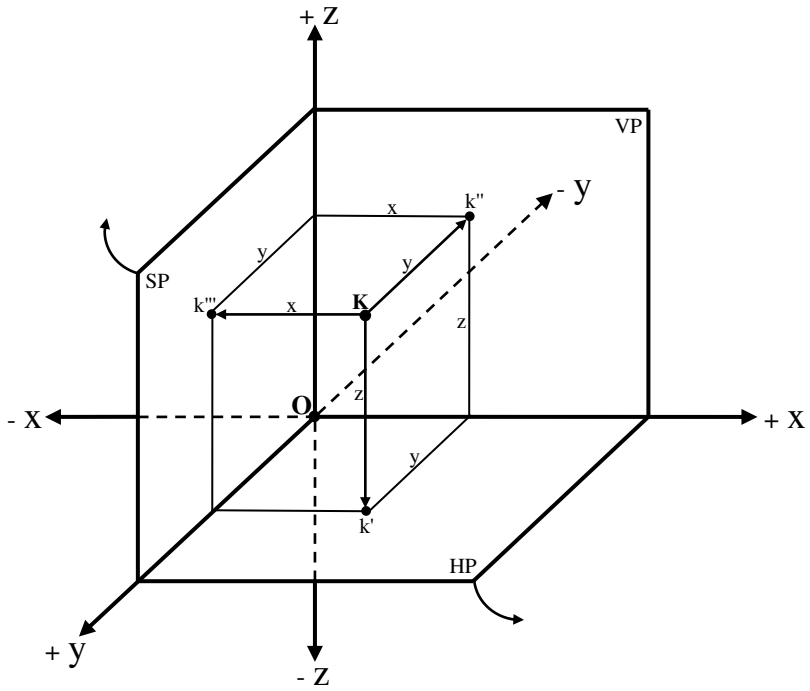


Figure (1).

To specify the three views for the point K (+x, +y, +z) descriptively, there are two methods for that. The first can be used one quarter of a circle; the second depends on drawing a line at 45 degrees passing through the origin point and bisecting both the 1st quadrant and 3rd quadrant. Below are the steps of the first method and figure (2) shows the three views of the point descriptively.

1. Selection of origin point on the GL and from this point, draw a vertical line which represents z – axis.
2. Specify a distance which has (x) value on the right side of point (o) if the sign of (x) is positive or on the left side if the sign is negative, then draw a straight line on which both the (k') and (k'') are placed. This line is perpendicular to x – axis.
3. From (k'), draw a parallel line to GL until it intersects z – axis in point (I), then draw an arc with radius (OI) by using the compass to intersect x – axis in point (Io).
4. Finally, erect a perpendicular to x - axis from point (Io) up or down according to the position of the (k'') from which a line is drawn perpendicularly to the z – axis to intersect the erected line. The intersection point is (k''').

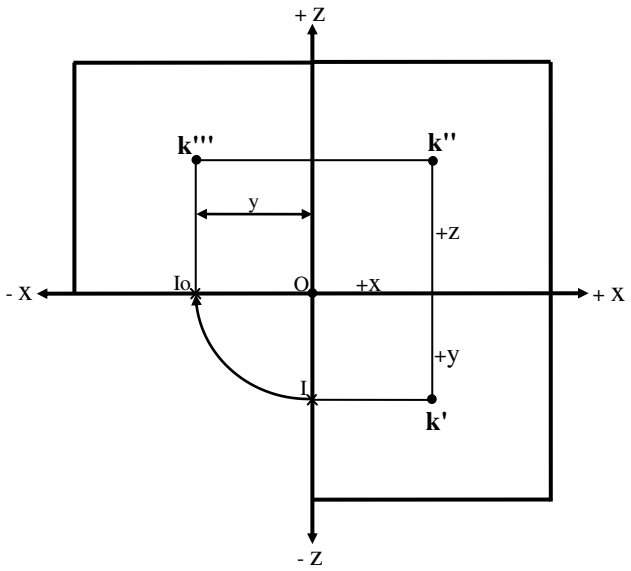
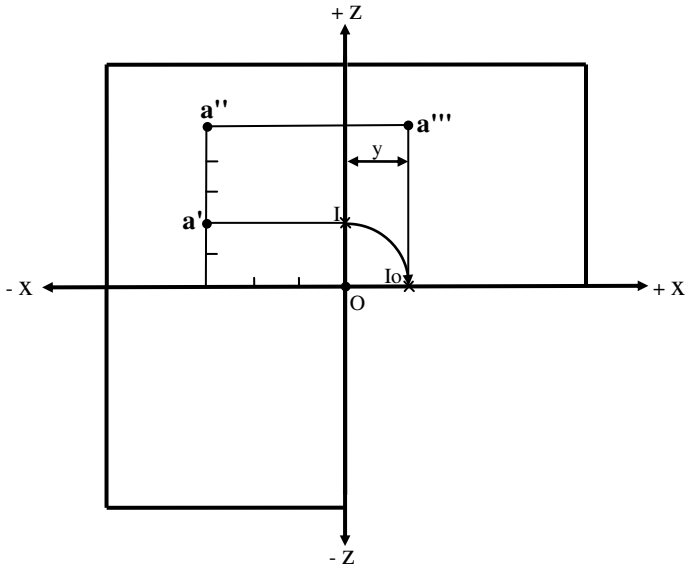


Figure (2).

Note: the position of the third view (k''') has appeared on the left side of z – axis when the sign of the (y) coordinate is positive, but the (k''') will be on the right side of z – axis in case the sign of the (y) coordinate is negative regardless whether the sign of the (x) coordinate is either positive or negative. The drawing of arc is in the 3rd quadrant when the (y) coordinate is positive whereas it is in the 1st quadrant when the (y) coordinate is negative.

Example: draw the Elevation, Plan, and Side view for the point (A) which has x - coordinate equals to (- 3cm), y - coordinate equals to (- 2cm), and the point is at a distance (5cm) away from the Horizontal Plane.



In the second method, the steps one and two are the same as they are in the first method. Then from (k') in figure (3), draw a horizontal line until it intersects the 45 degrees line at point (I). From this point, create a vertical line and the final step is drawing a horizontal line until it intersects the created line to form the (k''').

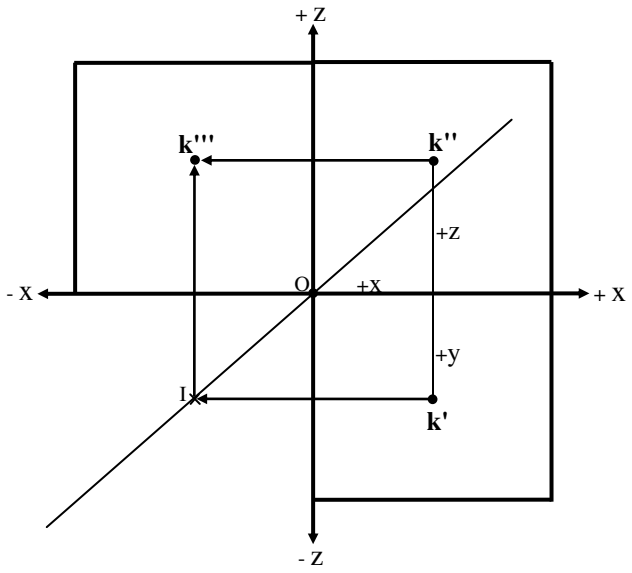


Figure (3).

Example: draw the three views for the point B(-2, -4, -5).