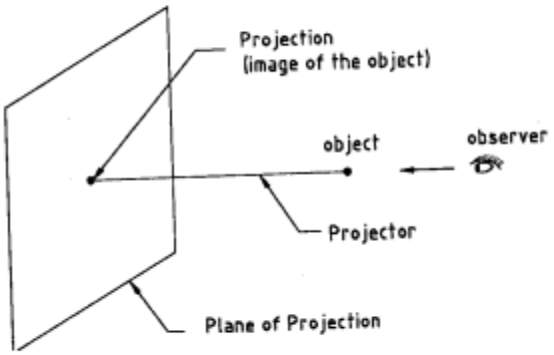
INTRODUCTION TO PROJECTION

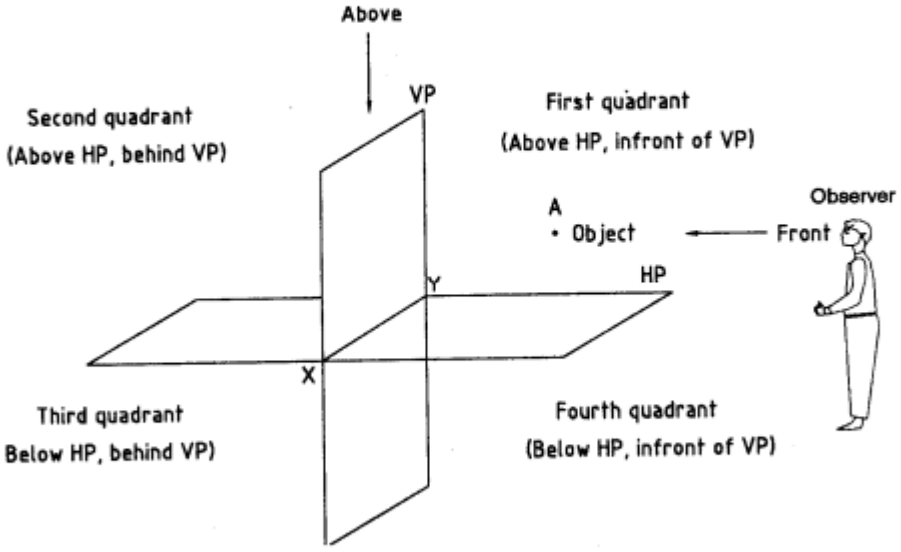
Projecting the image of an object to the plane of projection is known as ***projection***. The object may be a point, line, plane, solid, machine component or a building. Consider the following illustration to project the image of an object on to a plane.



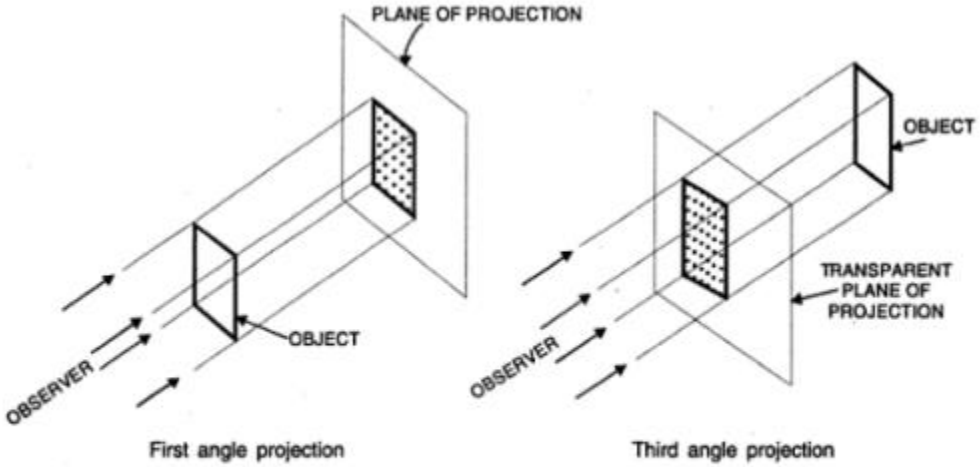
In engineering drawing practice, two principal planes are used to get the projection of object as shown in figure. They are

(1) Vertical plane (VP) which is assumed to be placed vertically. The front view of the object is projected onto this plane.

(2) Horizontal plane (HP) which assumed to be placed horizontally. The top view of the object is projected onto this plane.



When an object is assumed to be placed in first quadrant, the projection method followed is called as ***first angle projection***. In this method, the object is placed between the observer and the plane of projection.

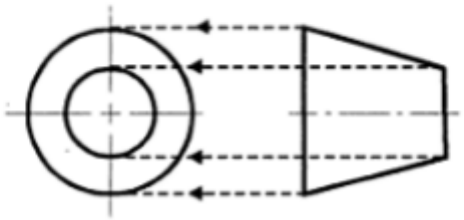


First angle projection Third angle projection

When the object is assumed to be placed in third quadrant, the projection method followed is called as ***third angle projection***. In this method, the plane of projection lies between the object and the observer.

First Angle Method

1. The object lies In between the observer and the plane of projection. The plane of projection Is always behind the object.
2. The object is assumed to be placed in first quadrant.
3. The front view or the elevation Is always above the top view or the plan.
4. The right hand end view/side view Is drawn to the left and left hand end view Is drawn to the right.
5. The plane of projection may or may not be transparent.
6. It Is represented by the following symbol:



CONVENTIONS FOLLOWED

(1) In drawing practice, capital letters A,B,C etc are used to represent objects in space.

(2) Their *top views* are represented by small letters a,b,c etc.

(3) The *front views* are represented by small letters with dashes a',b',c', etc.

(4) These letters are used to represent a point, ends of a straight line, corners of solid etc.

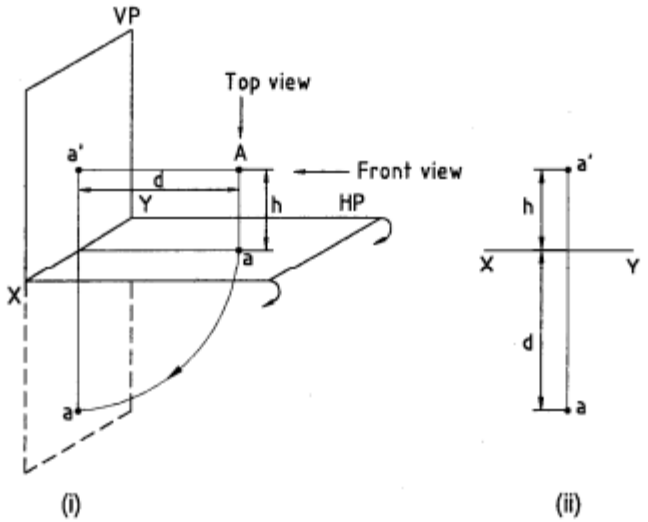
(5) Actual projections in top and front views are drawn in thick lines, construction lines and projectors are drawn using thin lines.

(6) Top view is also known as *plan* and front view is known as *elevation*.

PROJECTION OF A POINT IN FIRST QUADRANT

Consider a point A placed in the first quadrant. This is at a height h mm above HP, at a distance d mm in front of VP. Its front view a' is projected onto VP and the top view a is projected onto HP.

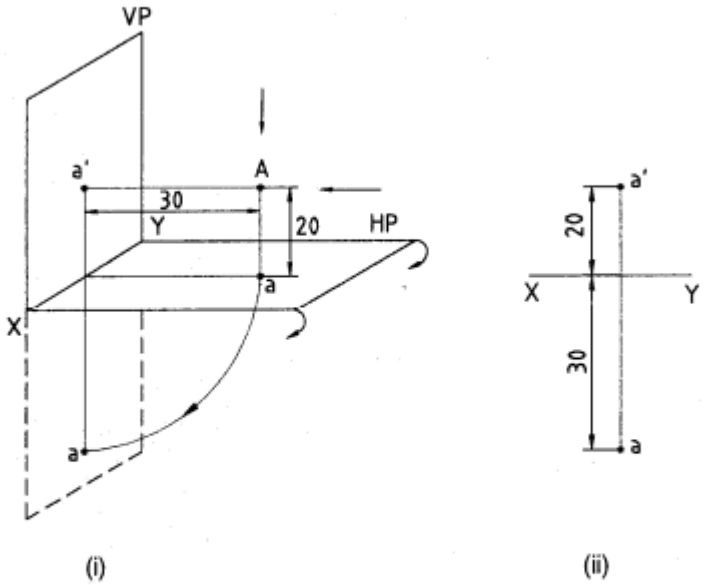
Now the HP is rotated in the clockwise direction for 90^0 and is obtained in vertical position. The projections will be seen as given in Fig.(ii).



It is drawn with reference to XY line. Mark a point a' at a height h mm above XY, and a at a distance d mm below XY. The projector joining a' and a is always perpendicular to XY.

EXAMPLE

A point A is 20 mm above HP and 30 mm in front of VP. Draw its projection.



To draw the projections

Draw the reference line XY. Mark a point a' at a distance of 20 mm above XY. Through this point draw a perpendicular line to XY and mark the top view a at a distance of 300 mm below XY.