

## **Gothic letters**

In gothic letters we follow 7:5 as height to width ratio for all letters except ( i, j, l, m & w).

And for numerals we follow 7:4 as height to width ratio for all numerals except ( 1 ).

## **Rules of letter writing**

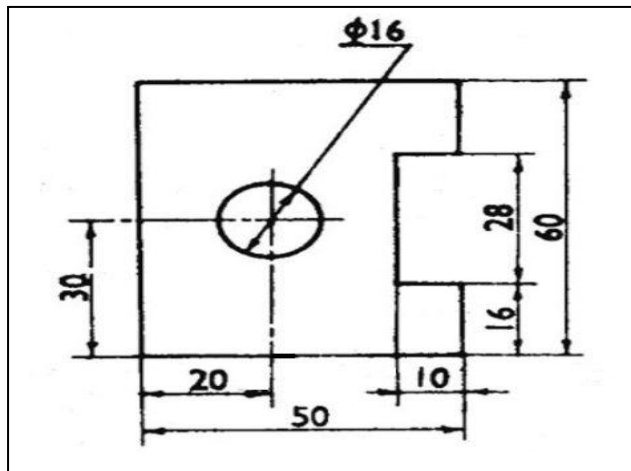
- a) Words should be spaced ONE LETTER WIDTH apart.
- b) Distance between two rows should be ONE LETTER HEIGHT.
- c) Artistic & cursive writing should be strictly avoided.
- d) Use single stroke vertical capital letters.
- e) Letters should appear upright from bottom edge, except when they are used for dimensioning.
- f) Letters in a Word are spaced by 2-3 mm.

## **Dimensioning systems**

Aligned & Unidirectional Systems

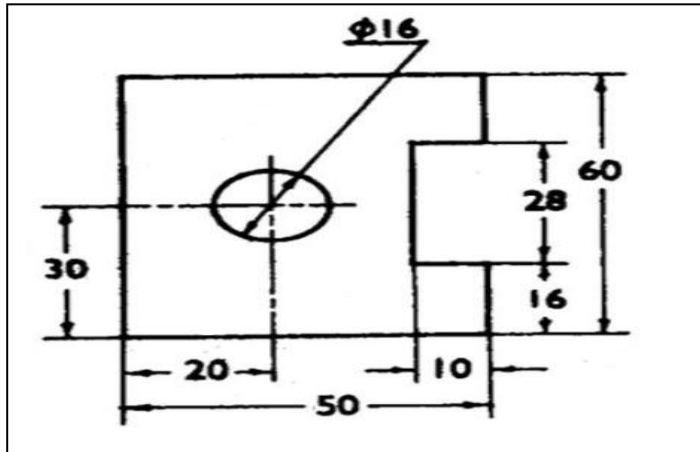
### **Aligned System:-**

In the aligned system, dimensions are placed perpendicular to the dimension line so that they may be read from the bottom or right-hand side of the drawing sheet. Dimensions are placed at the middle and on top of the dimension lines. See fig. below



### Unidirectional System:-

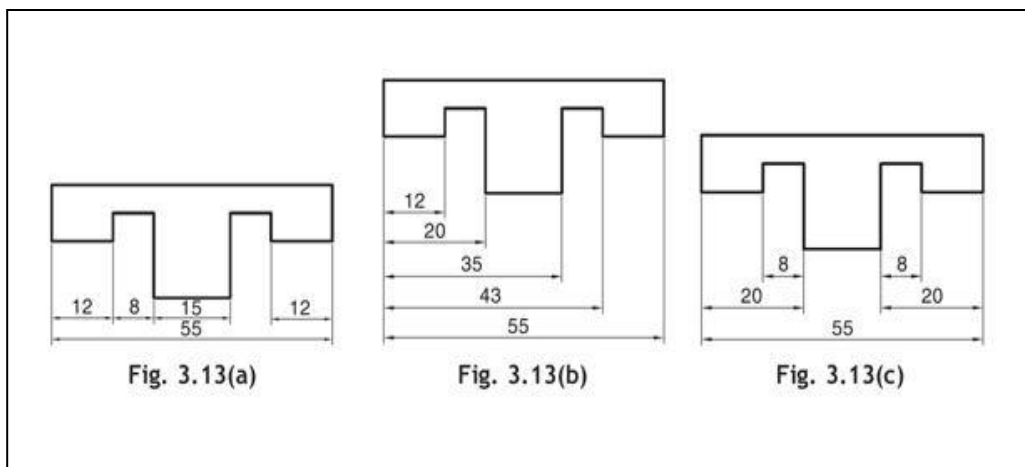
In the unidirectional system, dimensions are placed in such a way that they can be read from the bottom edge of the drawing sheet. As shown in Fig. below, all dimensions are placed at the middle and are inserted by breaking the dimension lines at the middle.



### **Chain dimensioning, Parallel dimensioning & Combined dimensioning.**

These are dimensioning methods for **DIMENSIONS IN SERIES**.

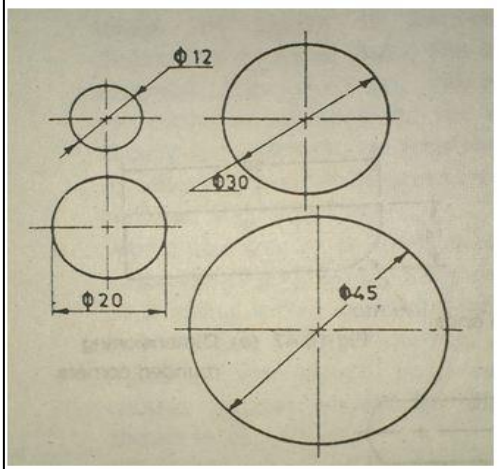
- i. Chain dimensioning (Continuous dimensioning) All the dimensions are aligned in such a way that an arrowhead of one dimension touches tip-to-tip the arrowhead of the adjacent dimension. The overall dimension is placed outside the other smaller dimensions, Fig. 3.13(a).
- ii. Parallel dimensioning (Progressive dimensioning) All the dimensions are shown from a common reference line. Obviously, all these dimensions share a common extension line. This method is adopted when dimensions have to be established from a particular datum surface, Fig. 3.13(b).
- iii. Combined dimensioning When both the methods, i.e., chain dimensioning and parallel dimensioning are used on the same drawing, the method of dimensioning is called combined dimensioning, Fig. 3.13(c).



## Dimensioning

Act of placing dimensions.

### Four different methods of placing dimensions for circles.



### Simple scale or plain scale.

A line which is divided into suitable no. of equal parts or units, the first part of which is further sub-divided into small parts or sub-units of main unit is known as Plain Scale.

The Plain scales are used to represent either two units (such as Kilometers, Decimeters ) OR one unit and its fraction (Meters and  $1/10$  th of meter).

### Diagonal scale.

The scale in which small divisions of short lines are obtained by following the principle of diagonal divisions is known as diagonal scale.

Diagonal scales are used to represent either 3 units of measurement (such as meters, decimeters and centimeters) OR two units and a fraction of its second unit.

### Representative Factor & Length of scale

$RF = \text{Length of line on the drawing} / \text{Actual length of the line on the object.}$

$LOS = RF \times \text{Maximum length of the scale}$

### Reducing scale

When huge objects are to be drawn, they are reduced in size on the drawing. The scales used for these objects are called *reducing scales*. It is clear that the length of the object on the drawing is less than the actual length of the object. Reducing scales are mentioned in the format 1: Y, where Y is greater than 1. Hence,  $RF < 1$ .

## Enlarging scale

When smaller objects are to be drawn, they often need to be enlarged. The scales used in such cases are called *enlarging scales*. Obviously, the length of an object on the drawing is more than the corresponding actual length of the object. Enlarging scales are mentioned in the format  $X:1$ , where  $X$  is greater than 1. Clearly,  $RF > 1$ .

## Full scale drawings

When an object is drawn on the sheet to its actual size, it is said to be drawn to *full scale*. As the length on the drawing is equal to the actual length of the object, the full scale is expressed as  $1:1$ . Obviously, for full scale,  $RF = 1$ .

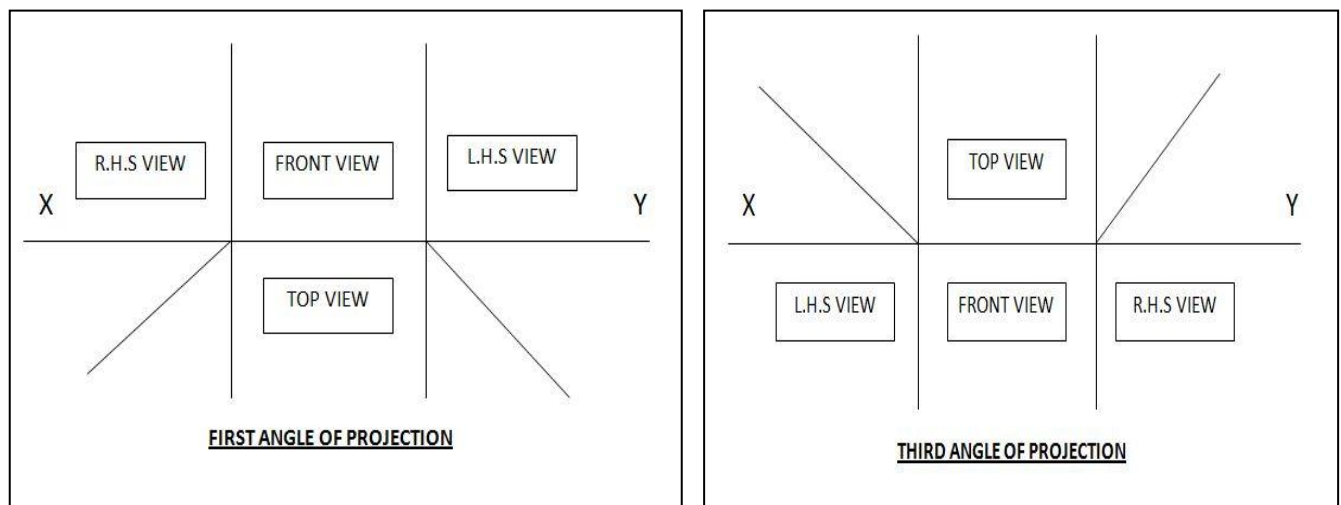
## Scale of the drawing

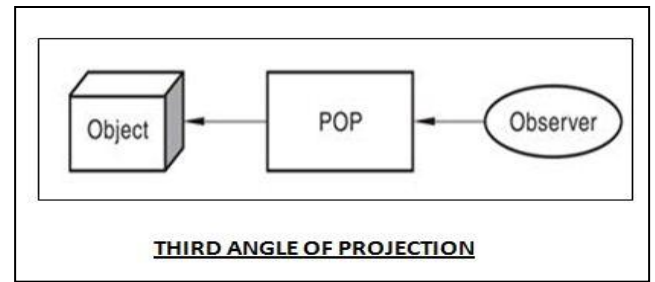
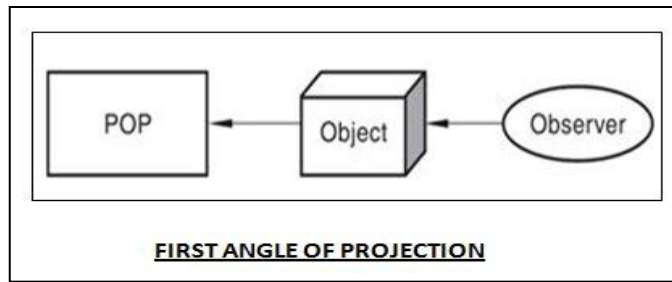
The proportion by which the drawing of a given object is enlarged or reduced is called the *scale* of the drawing.

## Orthographic projection

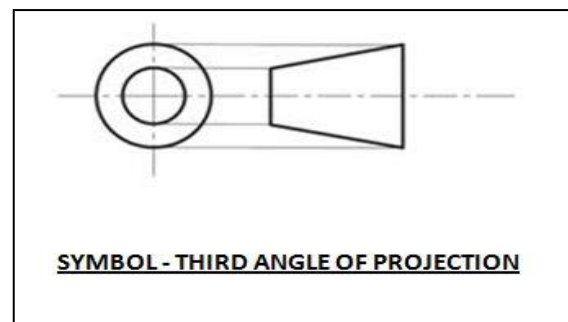
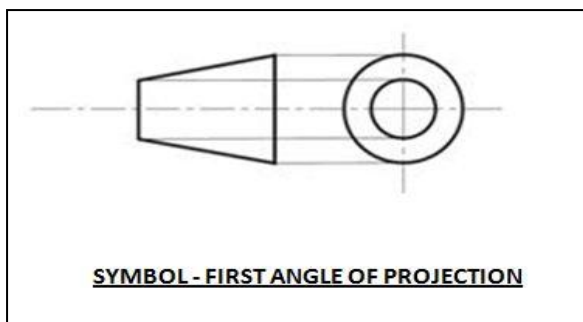
Multiview orthographic projection is a method of drawing two or more views of an object on the RPs placed at right angles to each other. The word 'ortho' means perpendicular. In this projection, the projectors are perpendicular to the POP and parallel to each other.

## Differences between First angle of projection & third angle of projection.





**Symbols of first angle & third angle projection methods.**



**Cannot draw in second & fourth quadrant**

Because Horizontal Plane & Vertical Plane OVERLAP with each other when Horizontal Plane is rotated CLOCKWISE. Due to this Front View & Top View obtained on VP & HP will also overlap and drawing will become confusing & impossible to read.