ME 101

ENGINEERING GRAPHICS

CHAPTER 6
OBLIQUE DRAWING

6.1. TO MAKE AN OBLIQUE DRAWING

Oblique drawing is similar to isometric drawing in that it has three axes that represent three mutually perpendicular edges and upon which measurements can be made. Two of the axes are always at right angles to each other, as they are in a plane parallel to the picture plane. The third; or depth axis may be at any angle to the horizontal, 30^{o} or 45^{o} being generally used (Fig. 6.1).

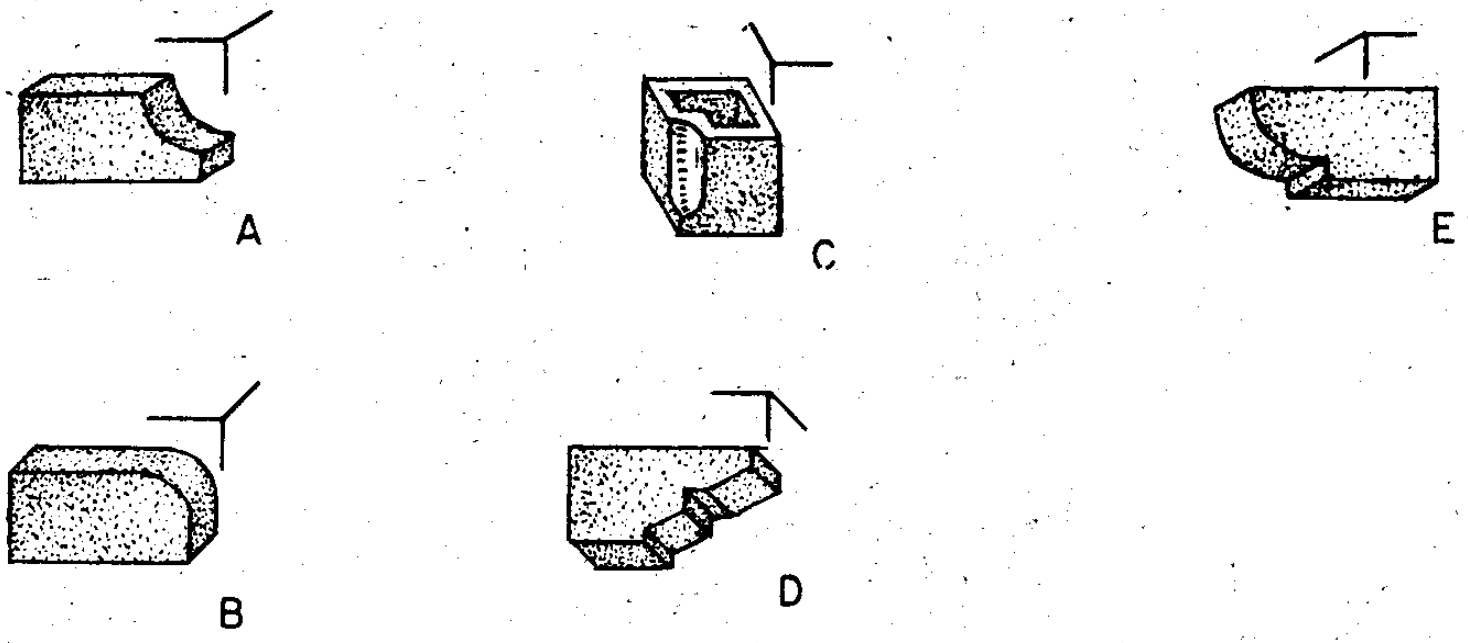


Fig. 6.1. Various oblique position. (A) up to the right at 30º; (B) up to the right at 45º, (C) up to the left at 45º, (D) down to the right at 30º; (E) down to the left at 30º.

Oblique drawing

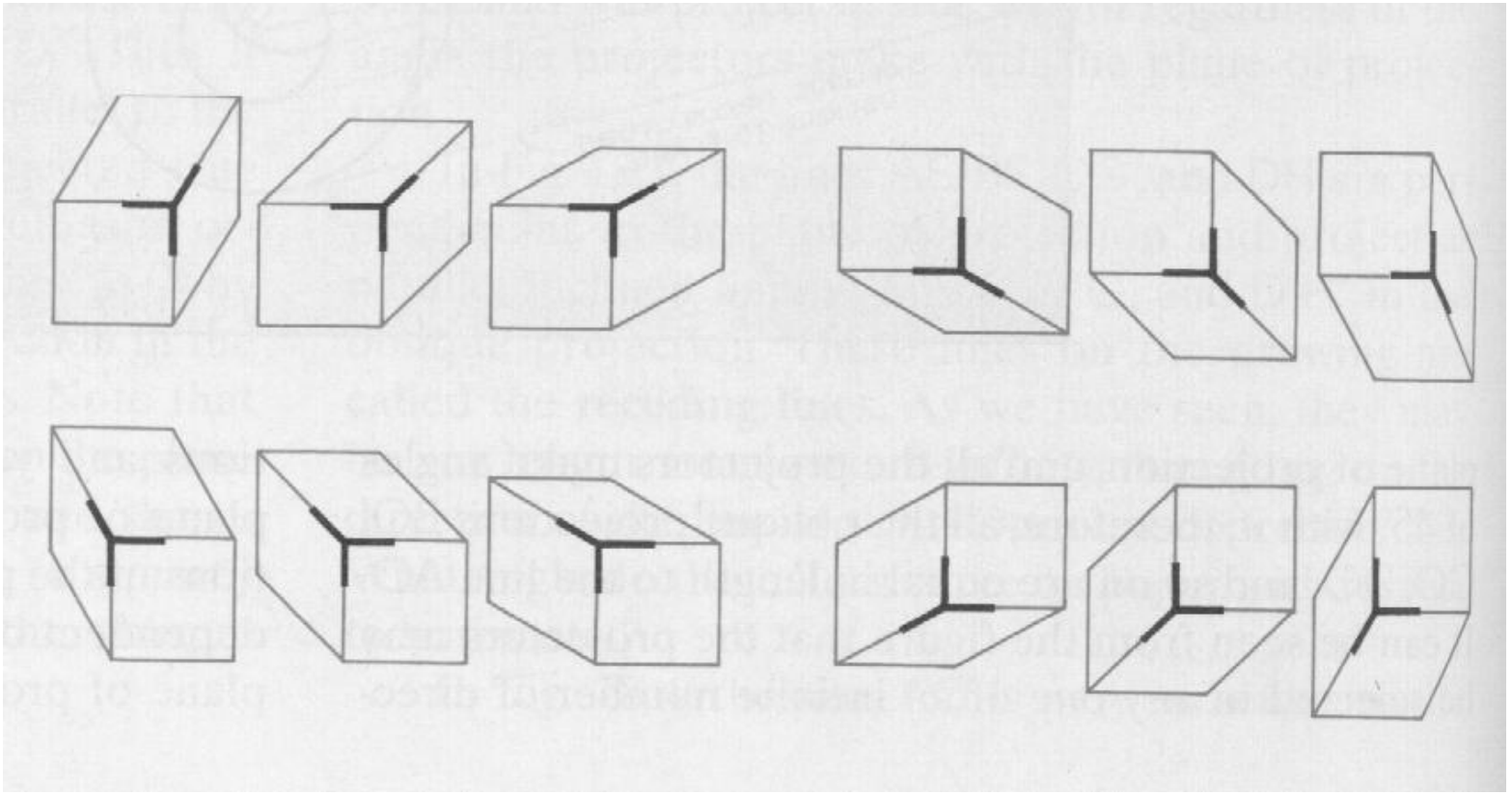
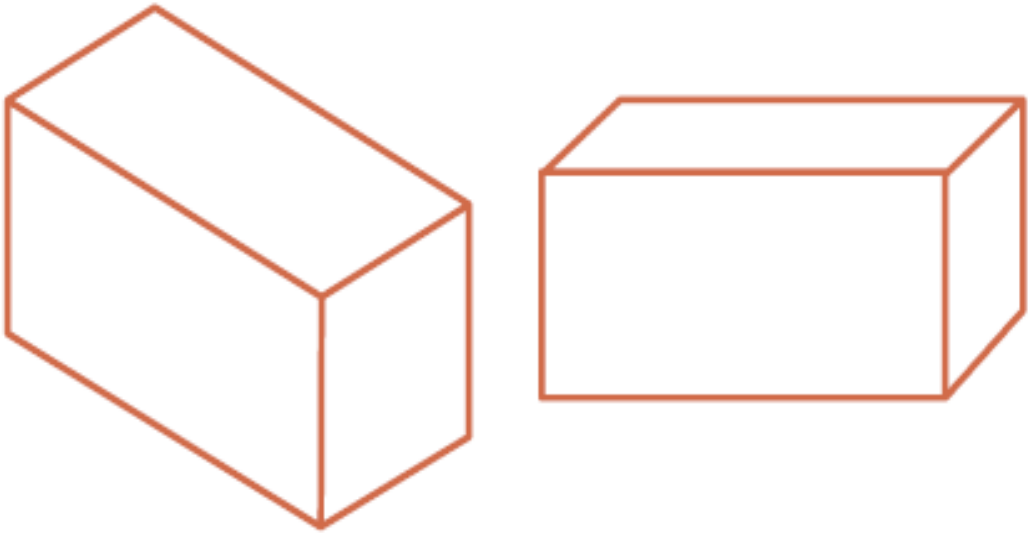


Fig. 6.2. Variation in direction of Receding axis.

Introduction

❑ This method of pictorial drawing is based on the procedure of placing the object with one face parallel to the frontal plane and placing the other two faces oblique (or receding) planes, to left or right, top or bottom, at any convenient angle.

❑ The three axes projection are vertical, horizontal, and receding.

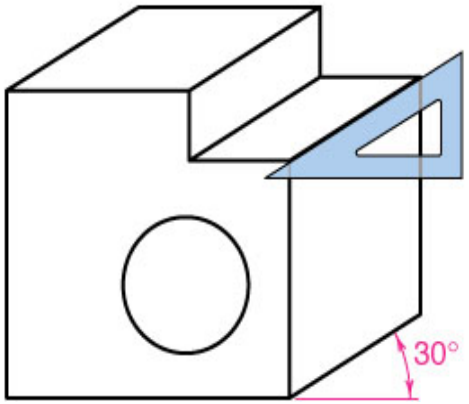


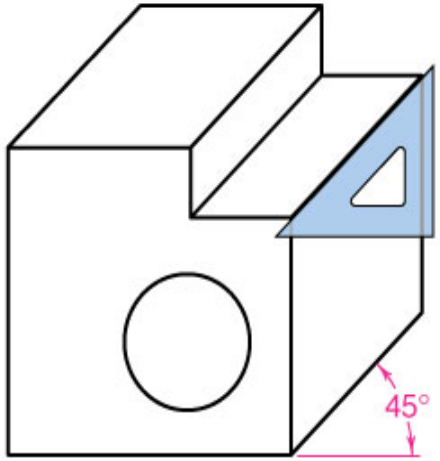
ISOMETRIC LAYOUT OBLIQUE LAYOUT

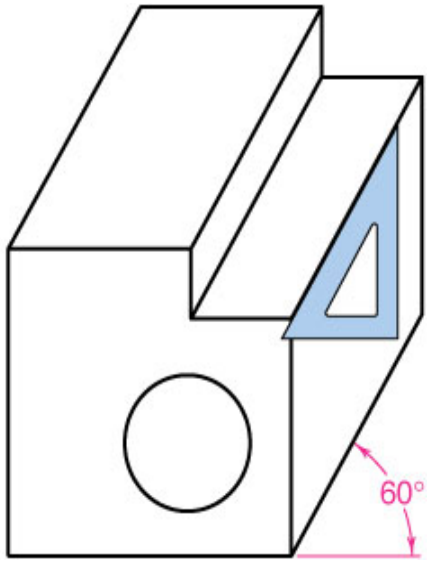
Oblique angle

- Receding axes are in 60, 45, and 30 degrees.

- This form of projection has the advantage of showing one face of the object without distortion.
- In the oblique pictorials coordinate system only one axes is at an angle. →The angle may range between 0 and 90 degrees; however, the most commonly used angle is 45 degrees.

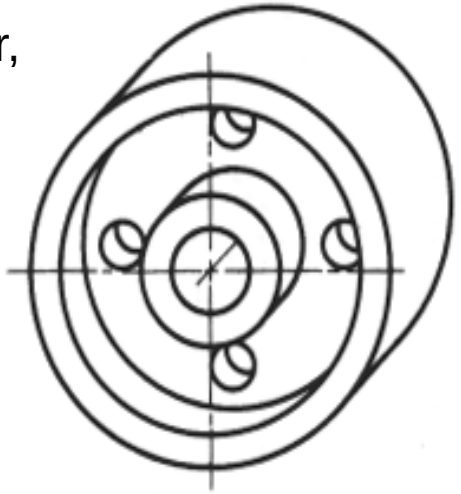


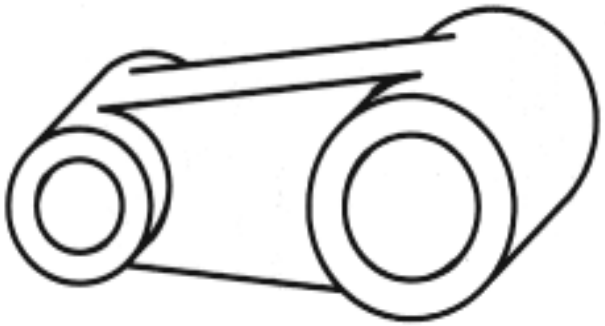


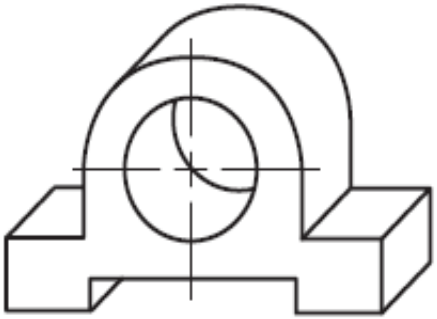


Oblique face

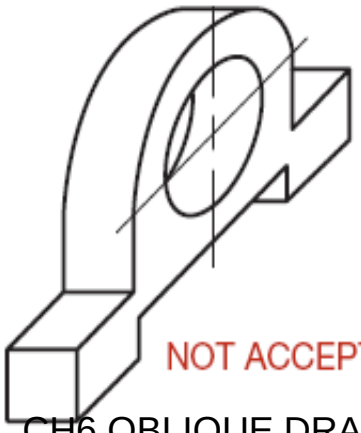
❑ The face with the greatest irregularity of outline or contour, the face with the greatest number of circular features, or the face with the longest dimension faces the front.



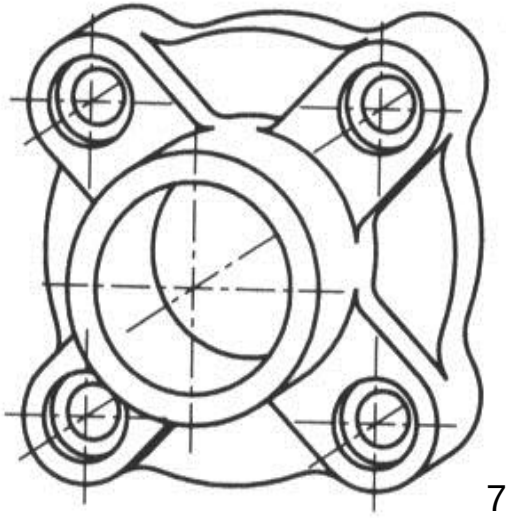




ACCEPTABLE



NOT ACCEPTABLE



Oblique projection types

Two types of oblique projection are used extensively.

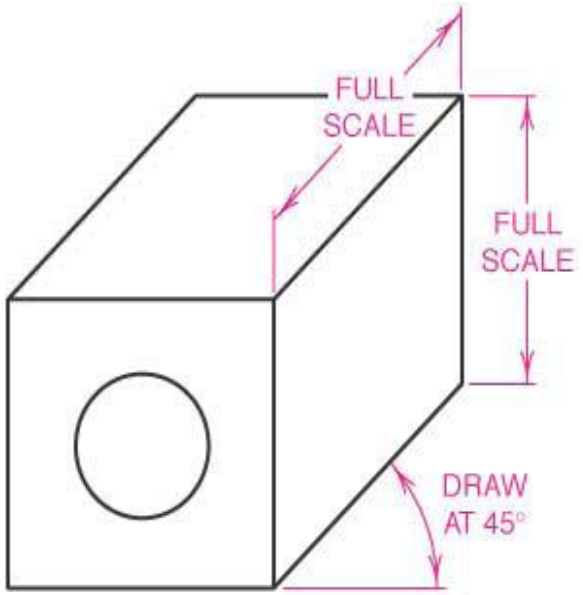
1) In cavalier oblique, all lines are made to their true length, measured on the axes of the projection.

2) In cabinet oblique, the lines on the receding axis are shortened by one-half their true length to compensate for distortion and to approximate more closely what the human eye would see.

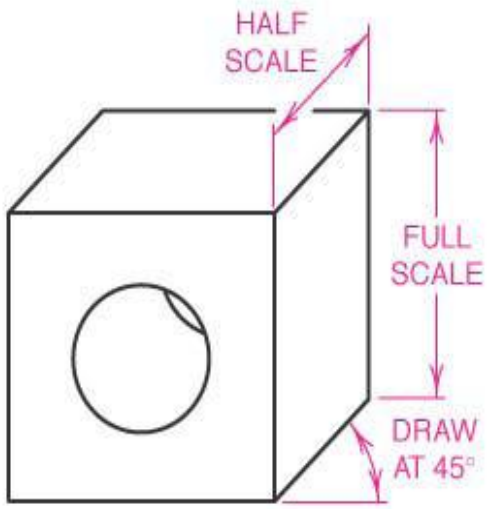
For this reason, and because of the simplicity of projection, cabinet oblique is a commonly used form of pictorial representation, especially when circles and arcs are to be drawn.

Note that hidden lines are omitted unless required for clarity. Most of the drawing techniques for isometric projection apply to oblique projection.

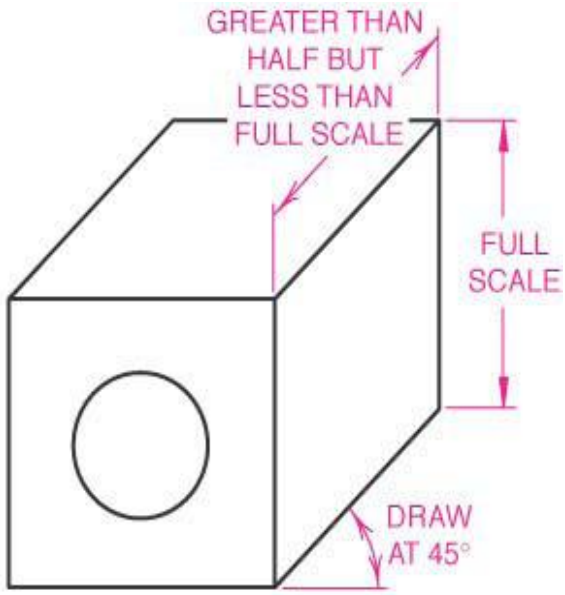
Oblique projection types



Cavalier oblique



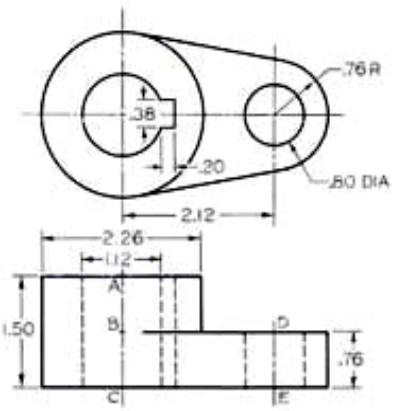
Cabinet oblique

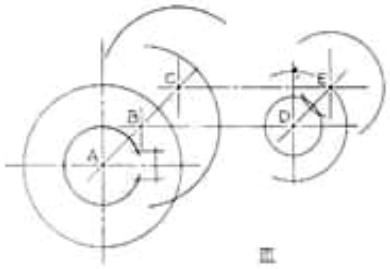


General oblique

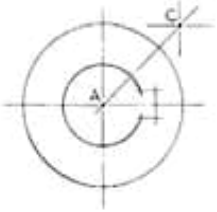
Exercise:

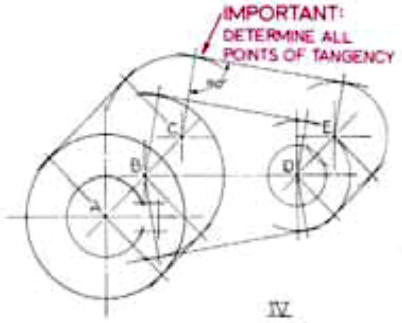
For cylindrical shape, oblique axes should be selected on the center line.





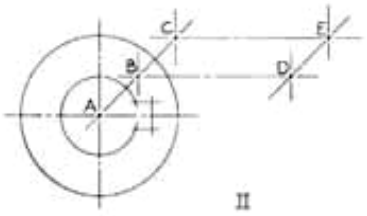
1) Circles appear as circles and are parallel to the plane of projection.

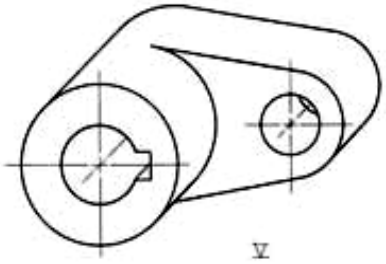




3) Draw arc tangent to all points of tangency.

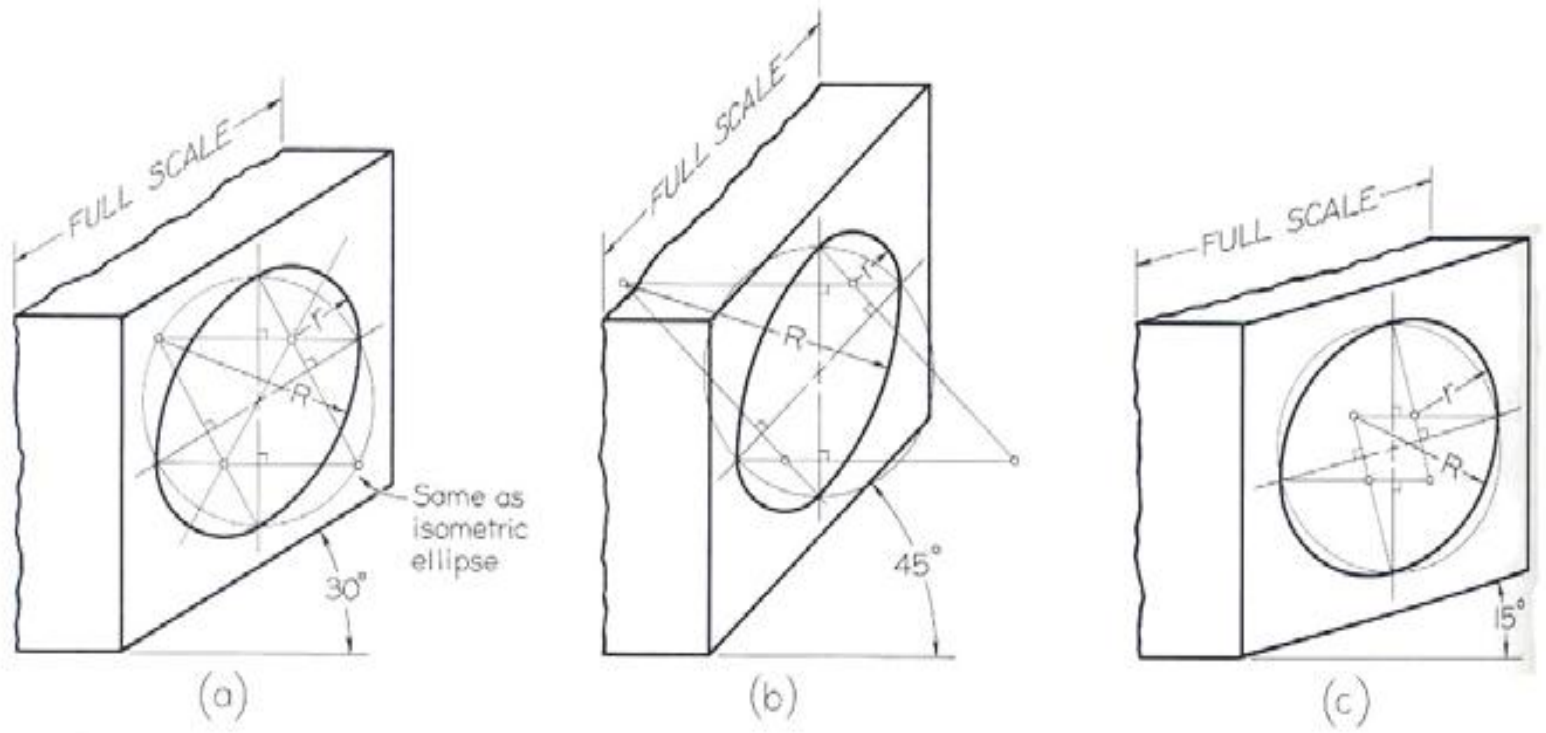
2) Transfer to other circles along the receding axis.





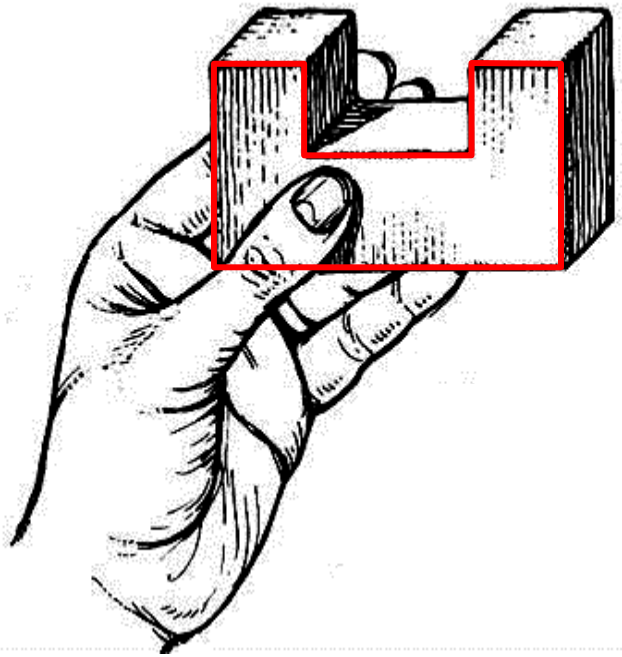
4) Heavy in the final detail.

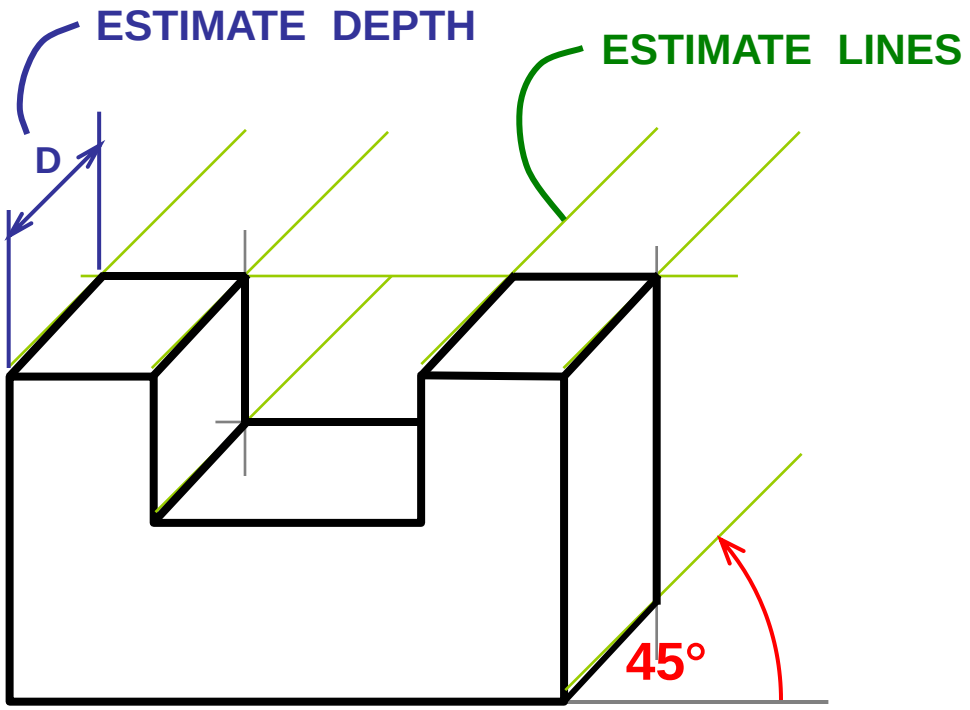
Circles in Oblique projection



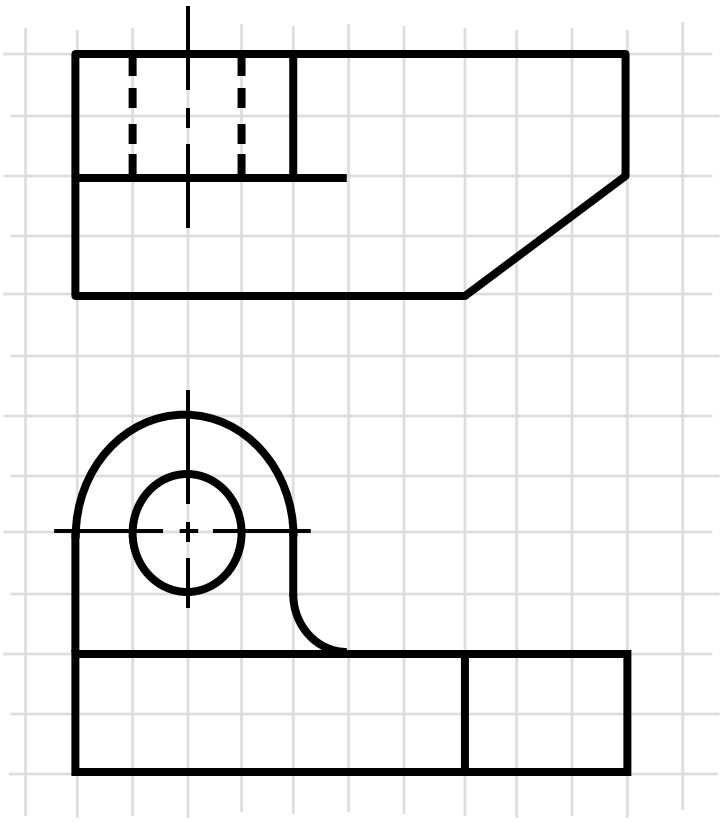
- This method can be used only in cavalier drawing.
- Same procedure as given in the isometric drawing.

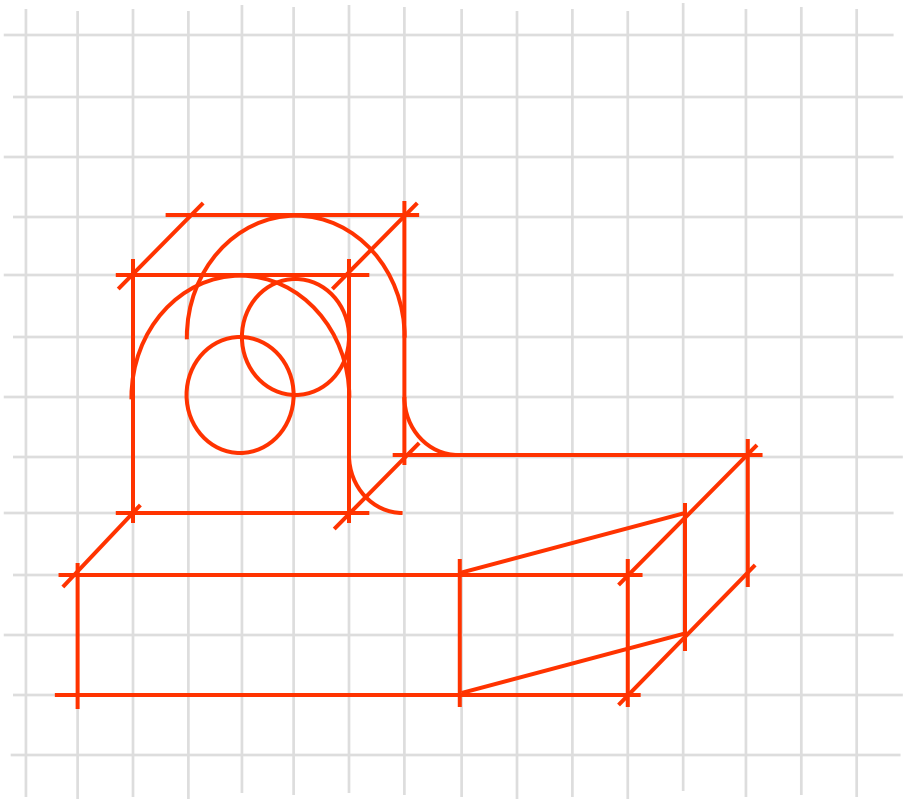
Oblique Drawing



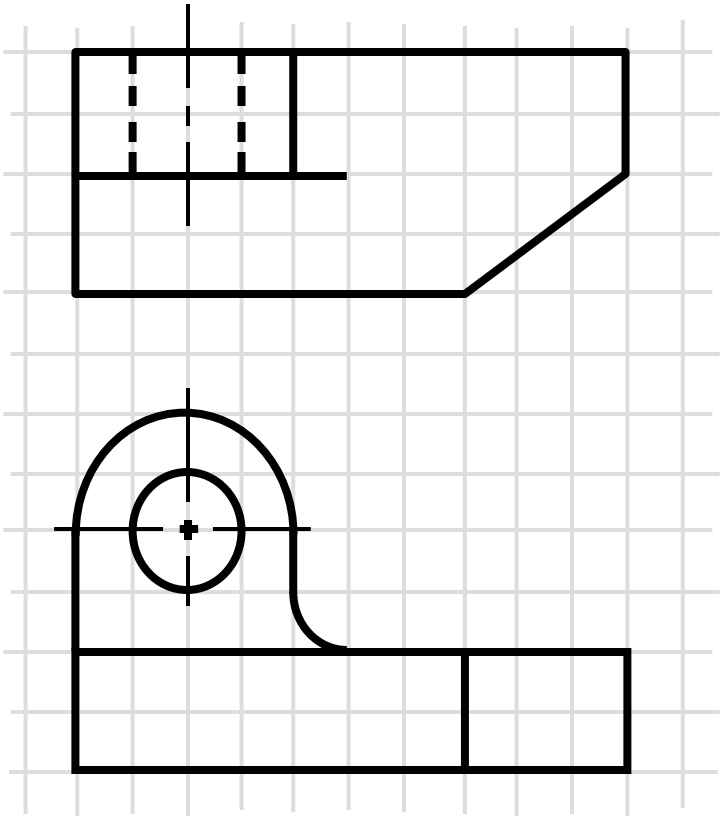


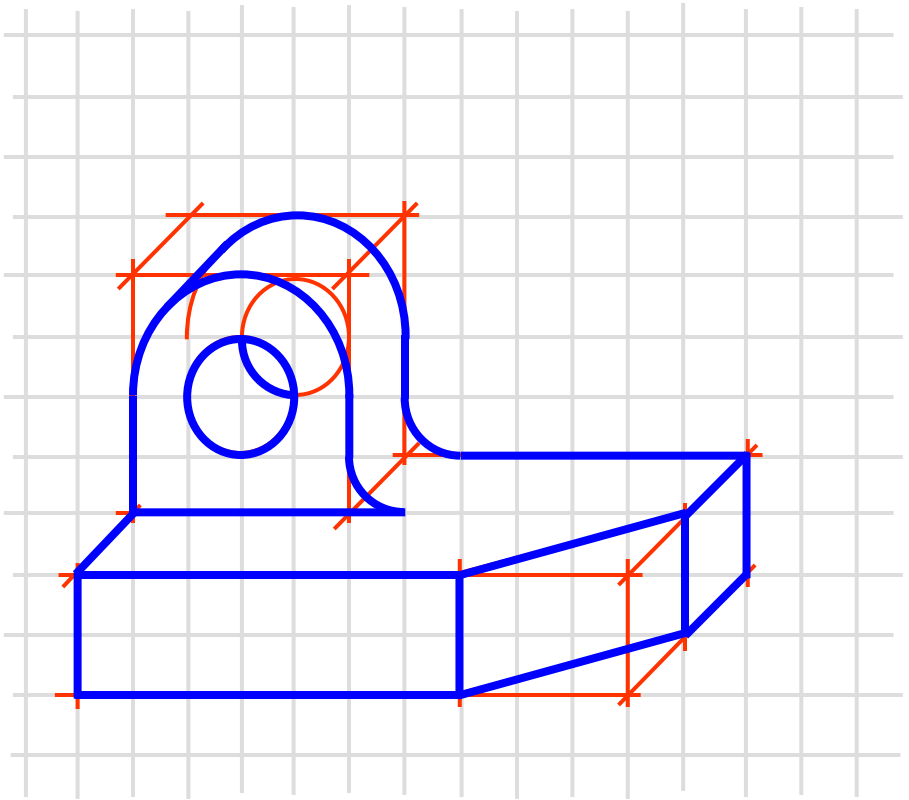
Oblique Drawing



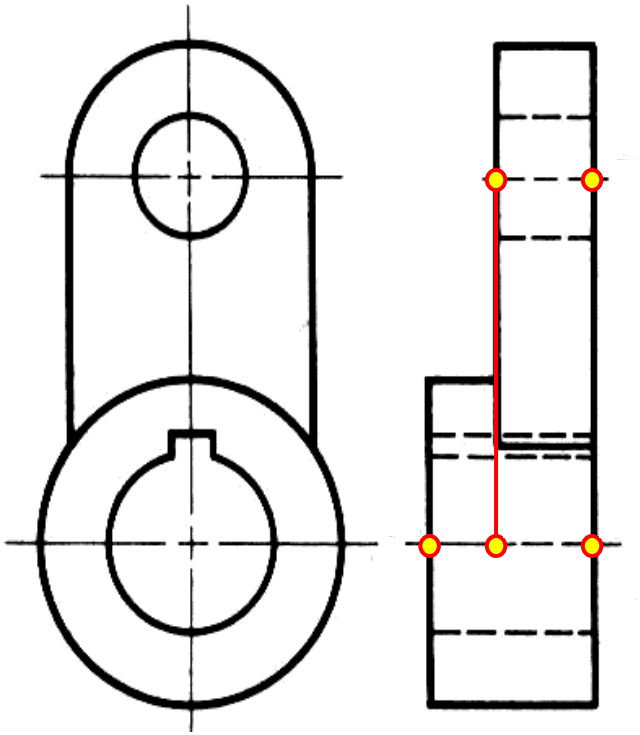


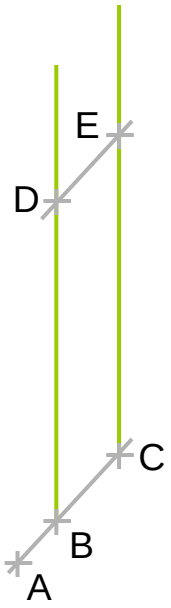
Oblique Drawing



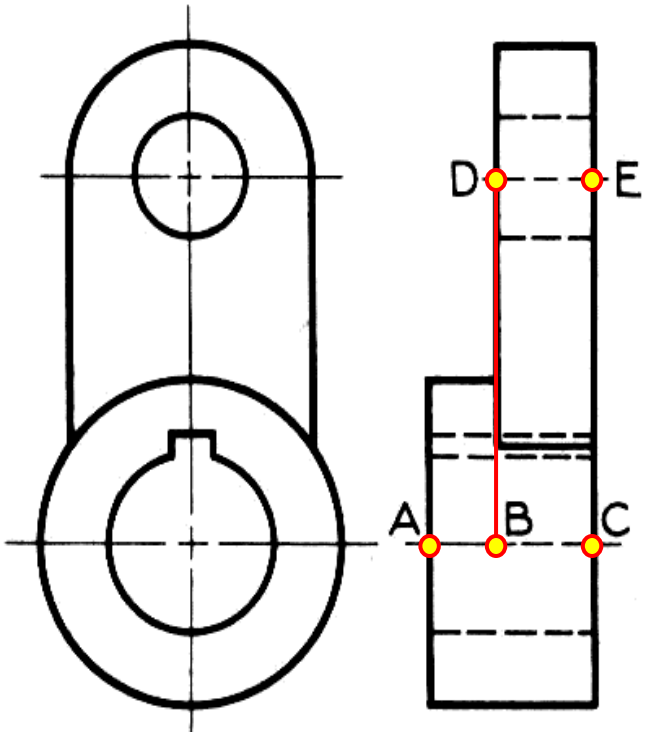


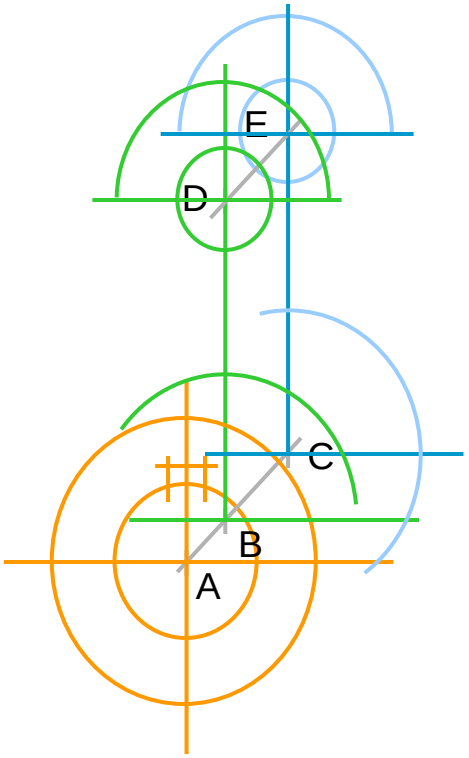
Oblique Drawing



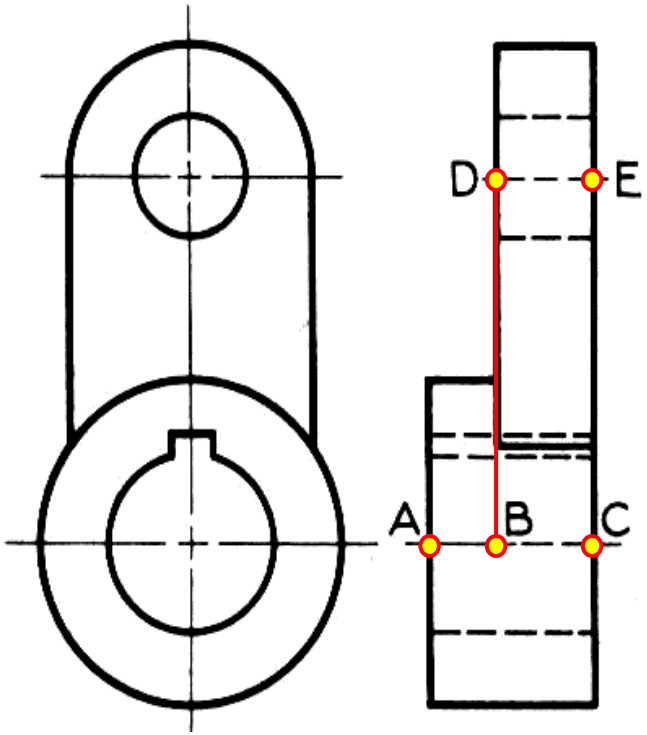


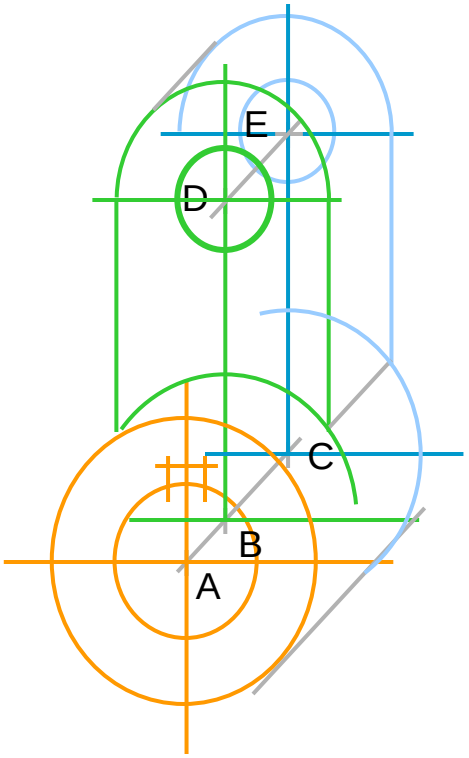
Oblique Drawing



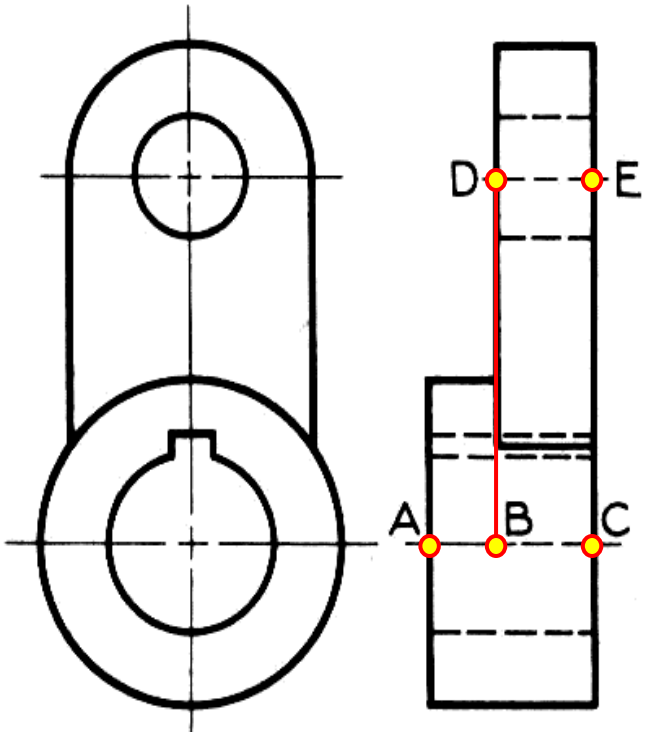


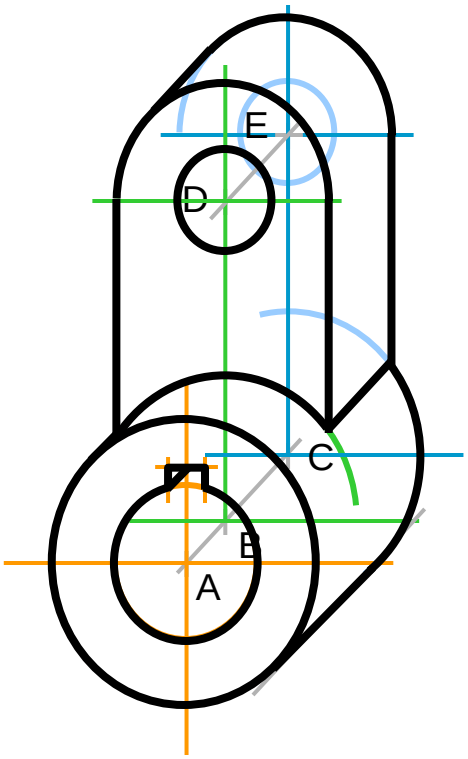
Oblique Drawing





Oblique Drawing





To draw a rectangular object (Fig.6.2) start with a point representing a front corner (A) and draw from it the three oblique axes, one vertical, one horizontal and one at an angle. On these three axes measure the height, width and depth of the object. In this case, the width is made up of 40 mm. distance and-the 15 mm. radius. Locate the centre of the arc, and draw it as shown. The center for the arc of the hole in the figure will be at the same point as the centre for the outside arc on the front face. The centre for the rear arc of the hole will be 15 mm. rearward on a depth axis line through the front centre.

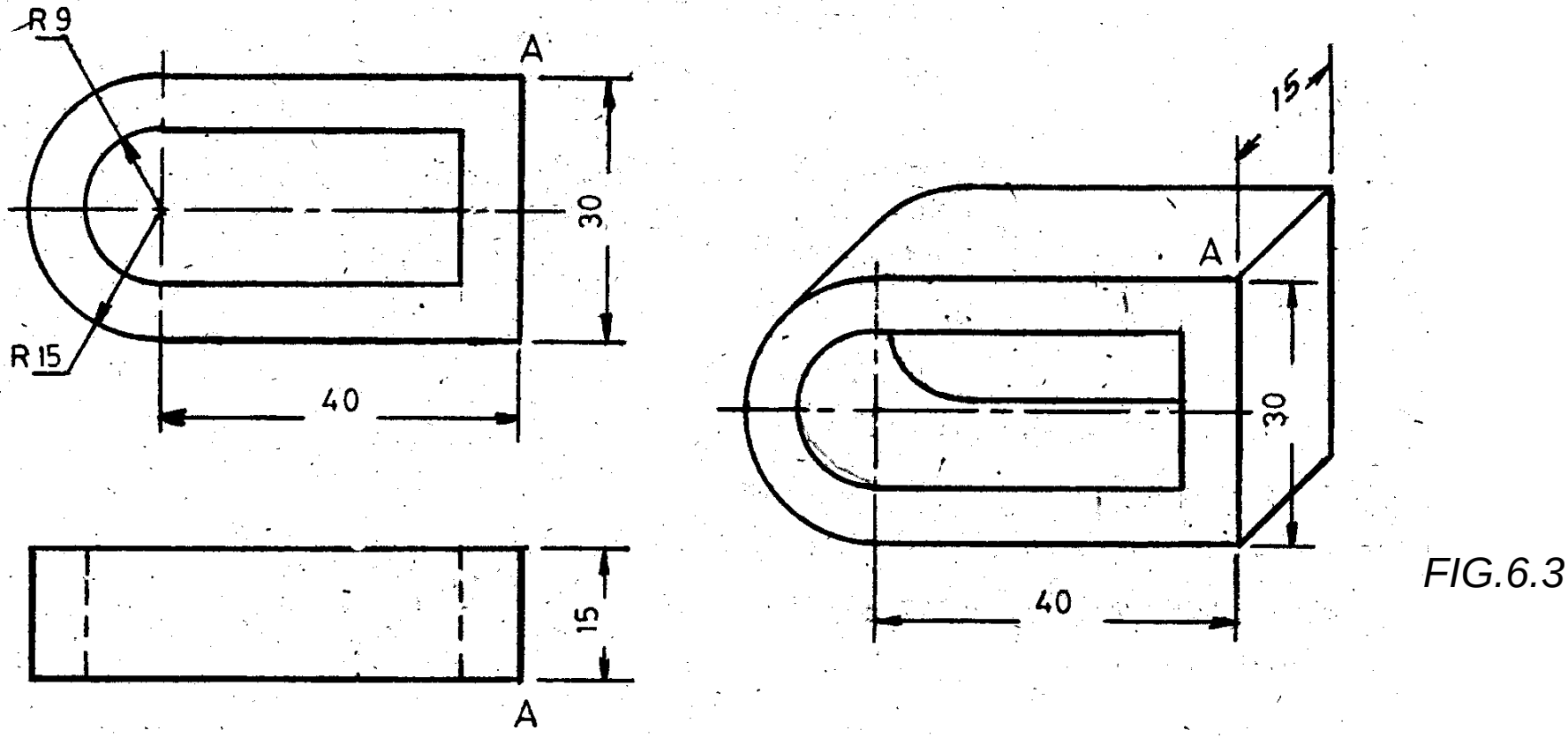


FIG.6.3

6.2. STARTING PLANE

Note that as long as the front of the object is in one plane parallel to the plane of projection, the front face of the oblique projection is exactly the same as in the orthographic front view. When the front is made up of more than one plane, take care to preserve one as starting plane and working from it forwards and backwards.

In a piece such as the link in Fig.6.3, the front bosses can be imagined as cut off on plane AA and the front view, that is the section on AA, drawn as the front of the oblique projection. Then lay off depth axes through the centers C and D, the distances, for example, CE behind and CF in front of plane AA.

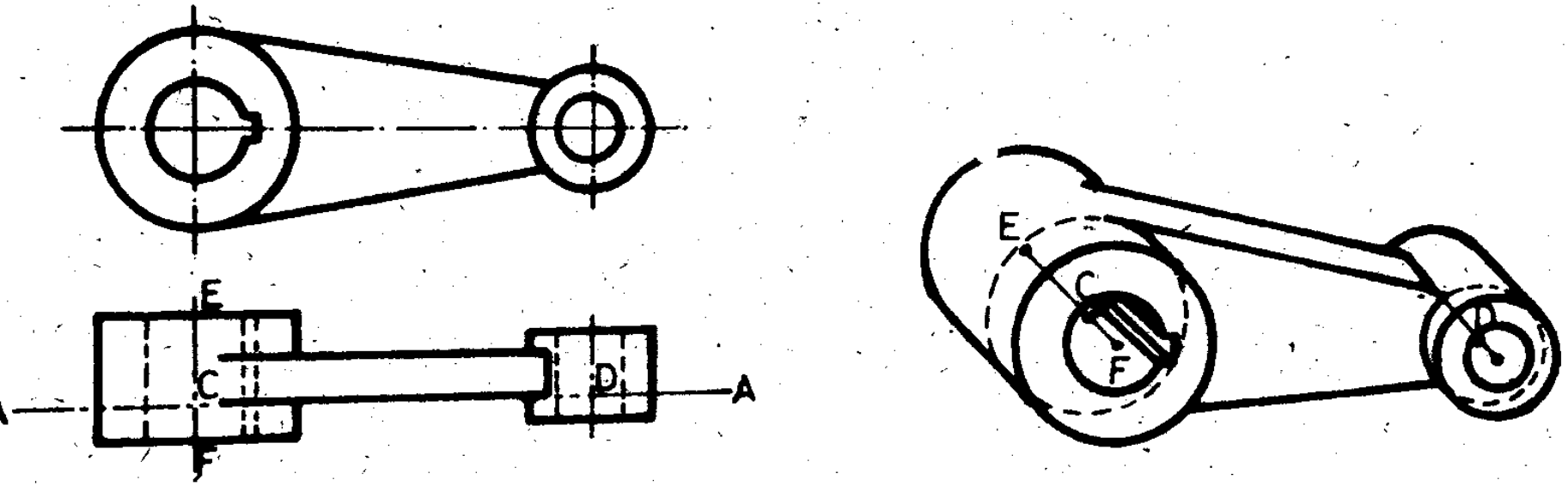


Fig. 6.*4 Offsets from reference plane. Distances forward and rearward are measured from the frontal plane.*

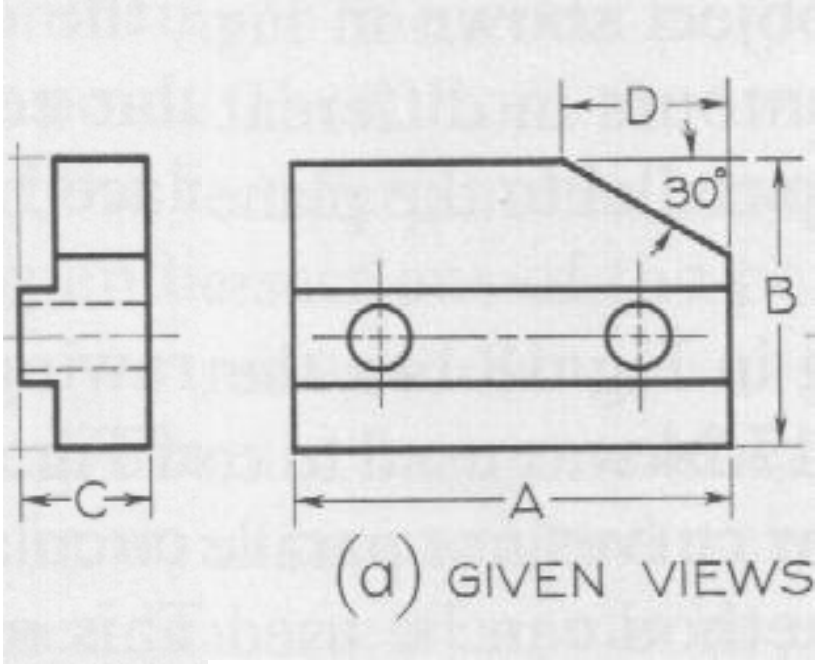
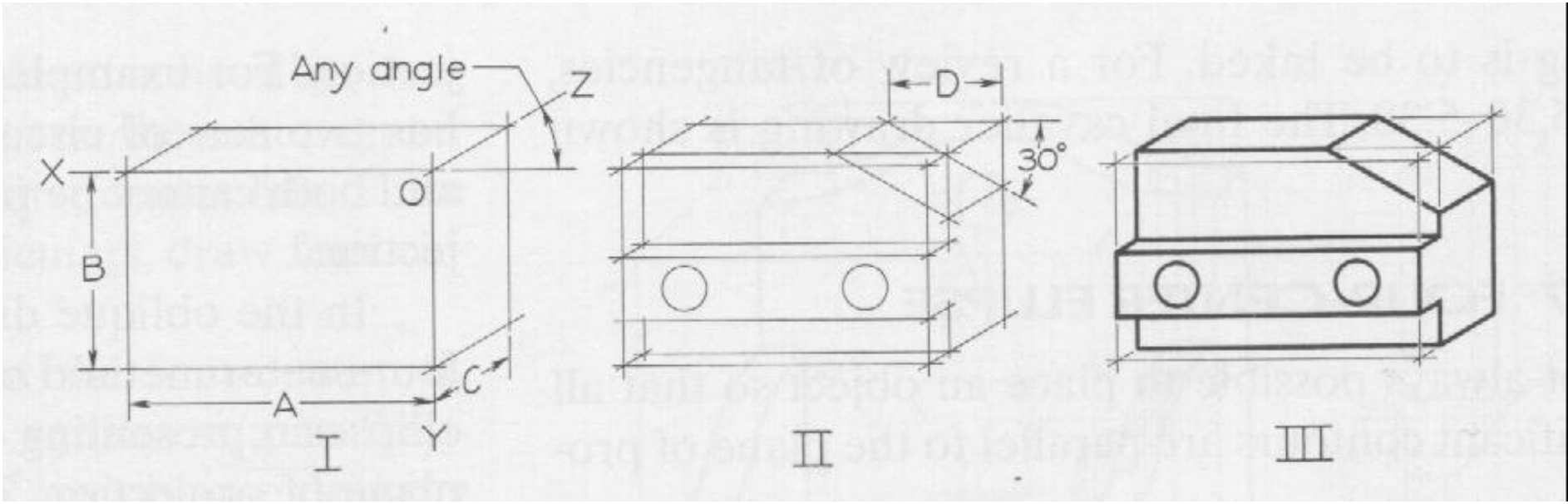
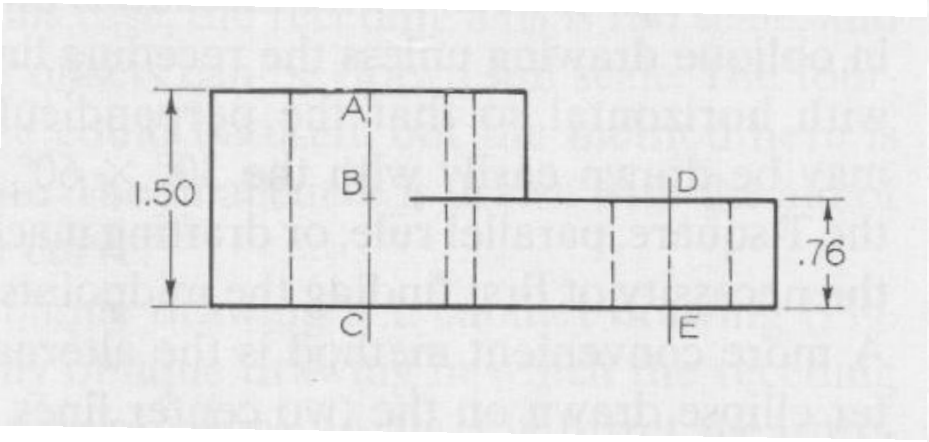
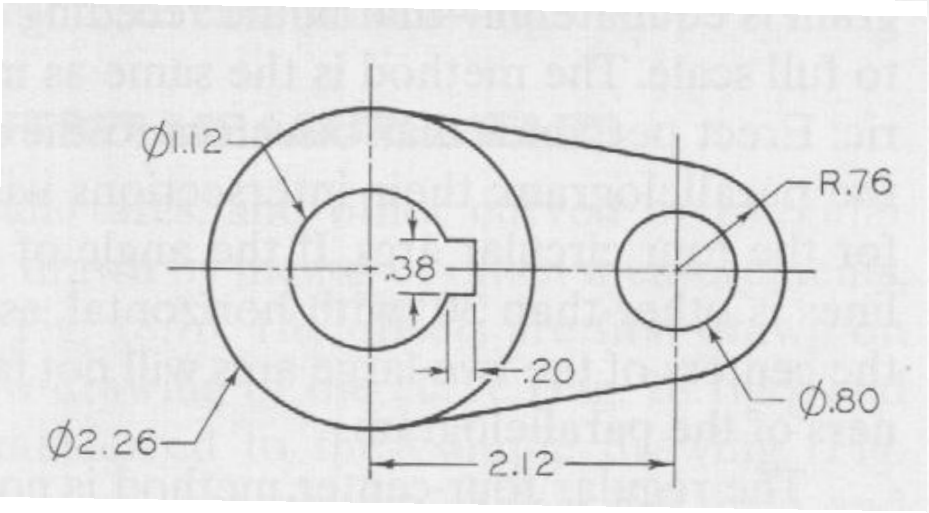


Fig. 6.5 Steps in Oblique drawing box construction







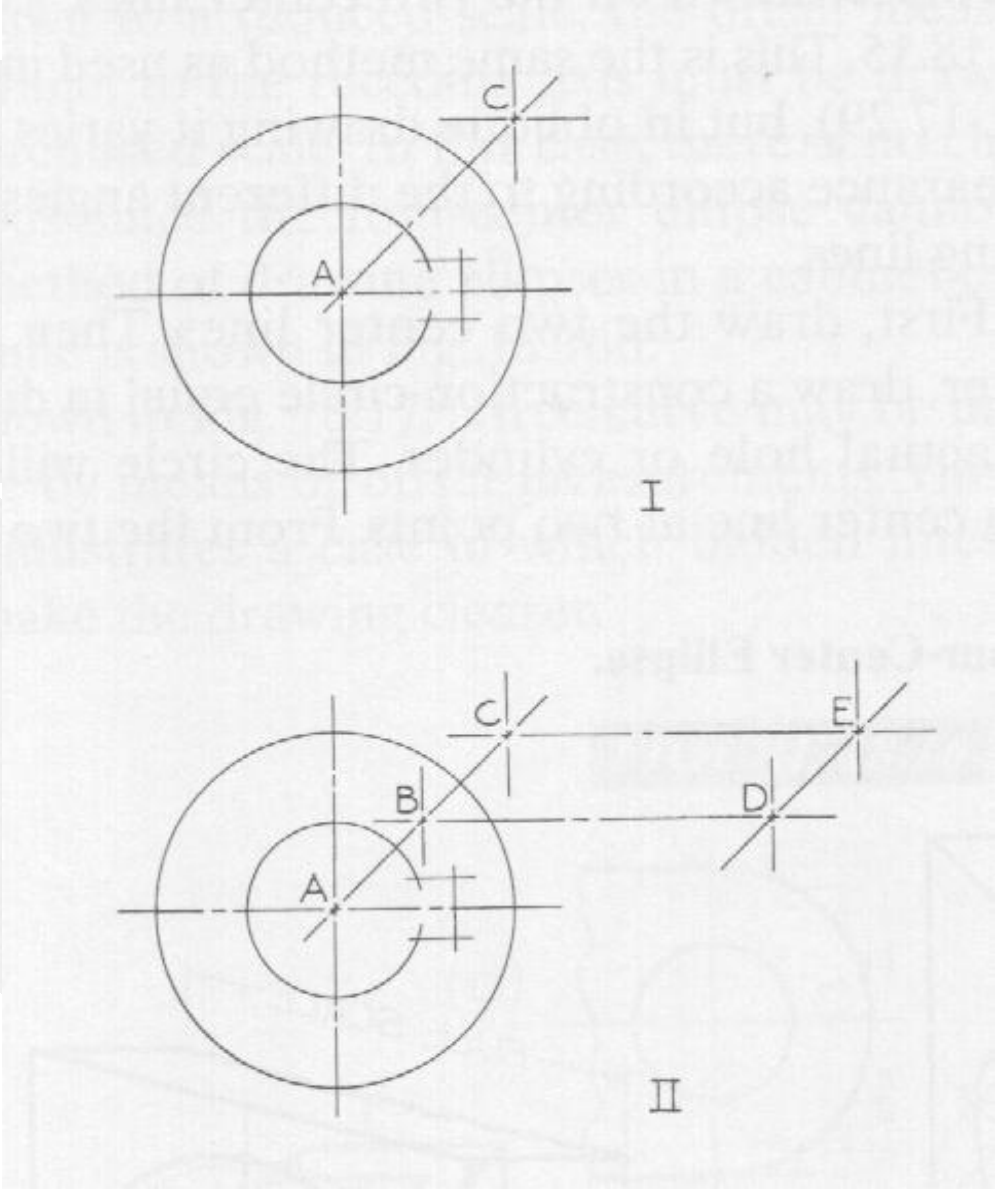
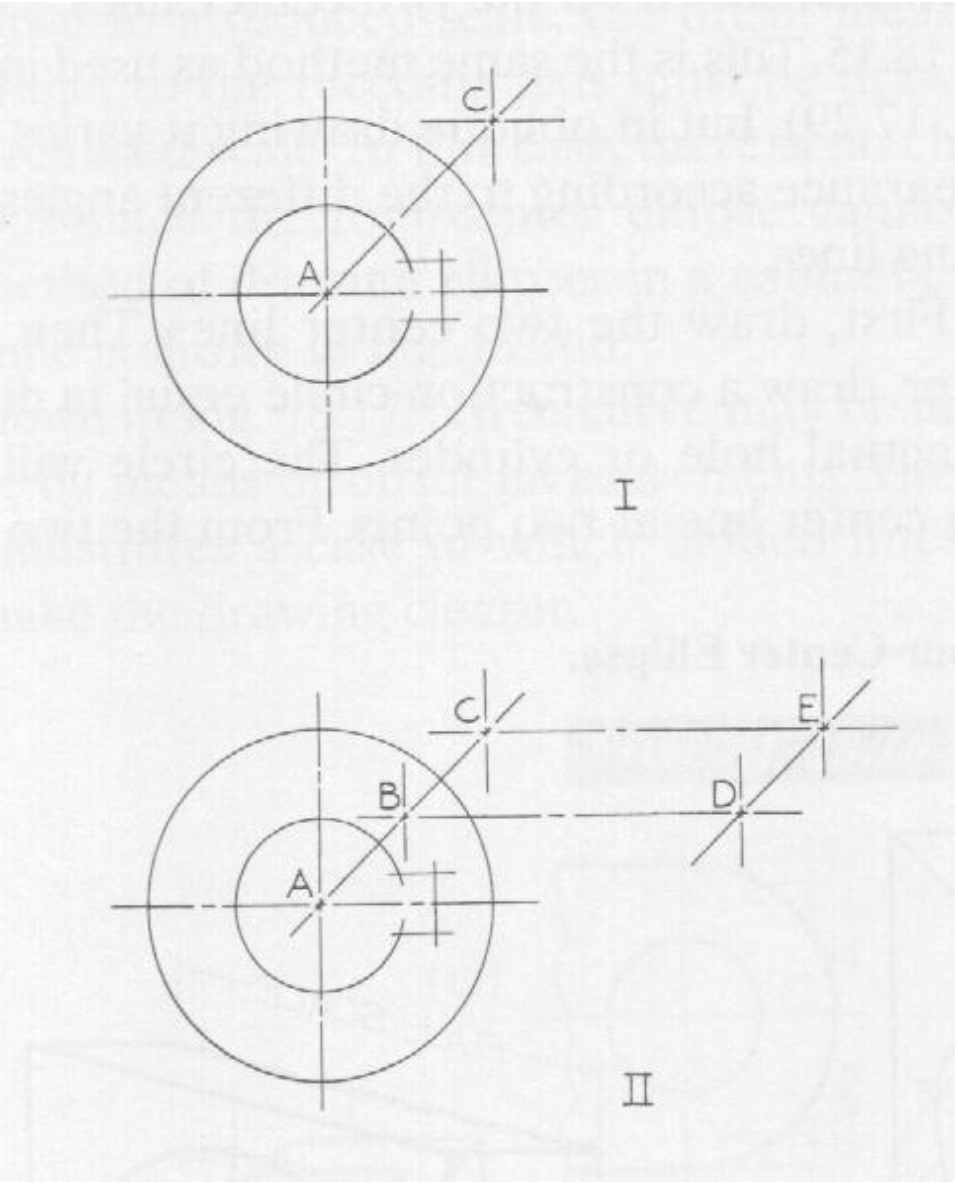


Fig. 6.6 Steps in Oblique drawing -Skeleton construction



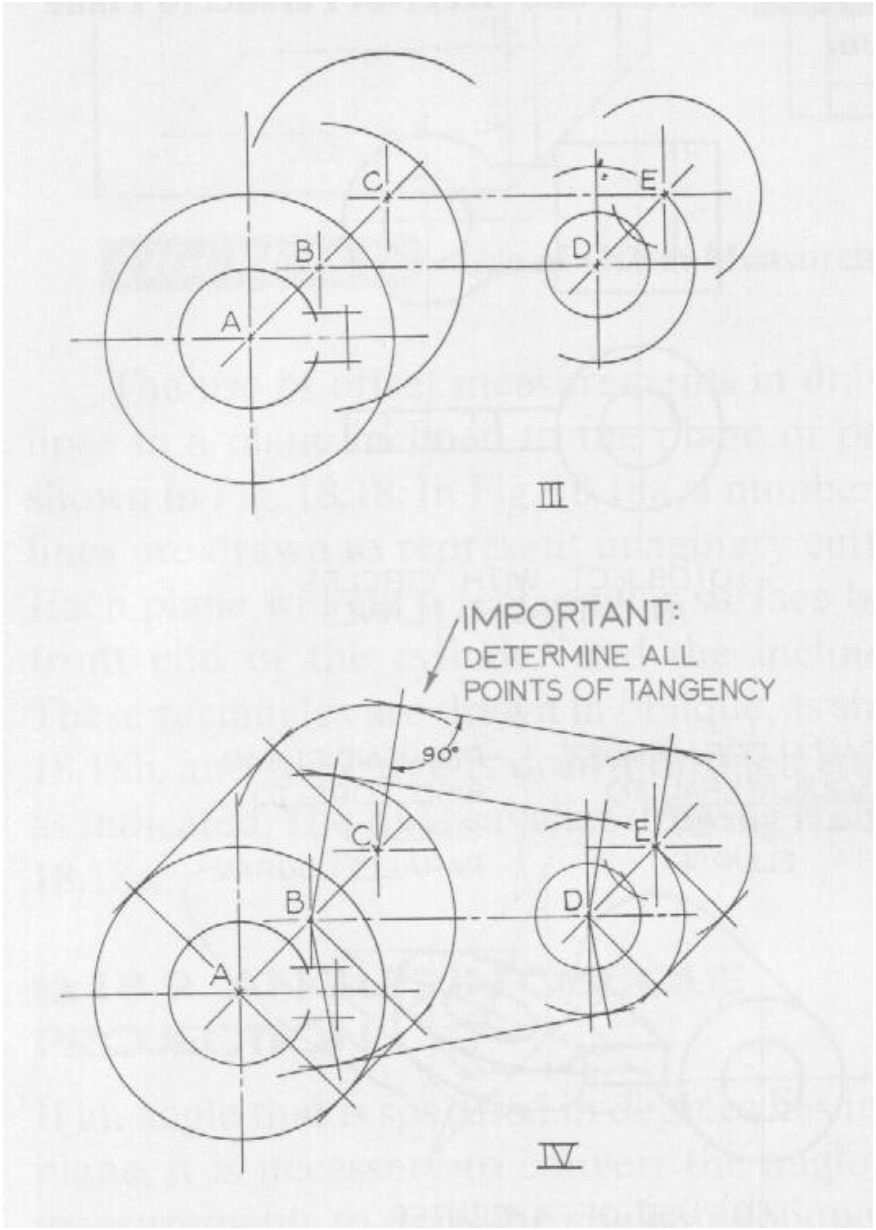
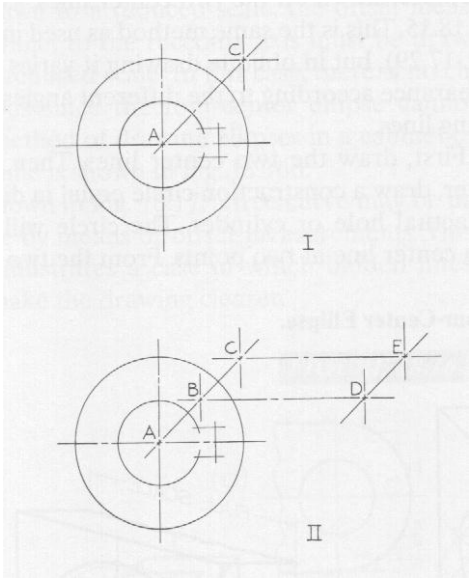
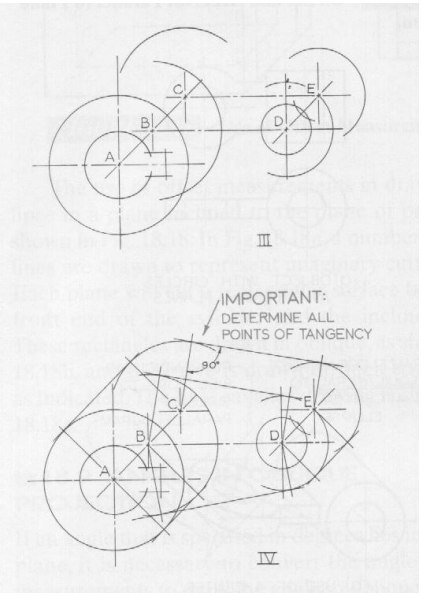


Fig. 6.7 Steps in Oblique drawing -Skeleton construction





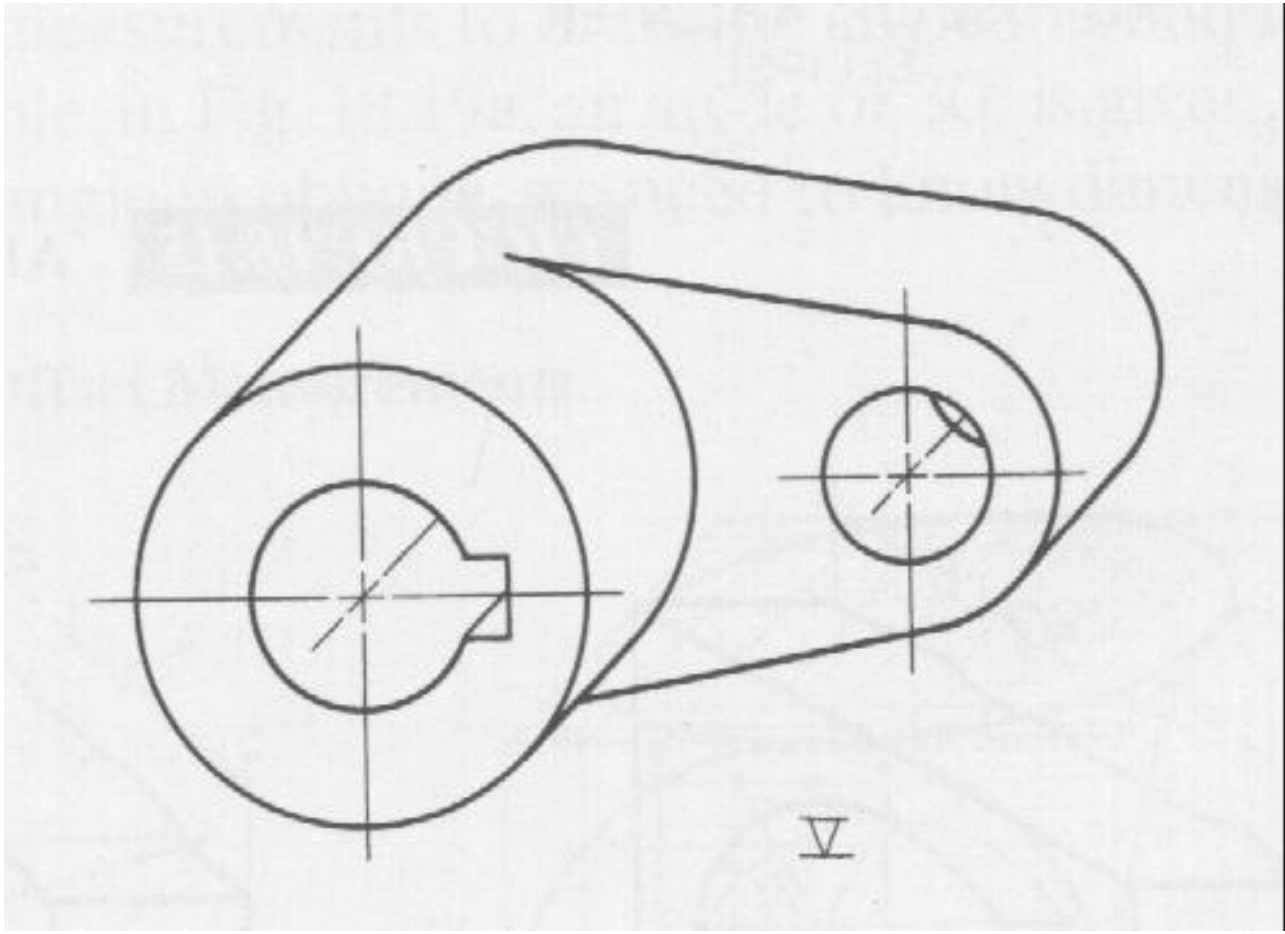


Fig. 6.8 Steps in Oblique drawing -Skeleton construction

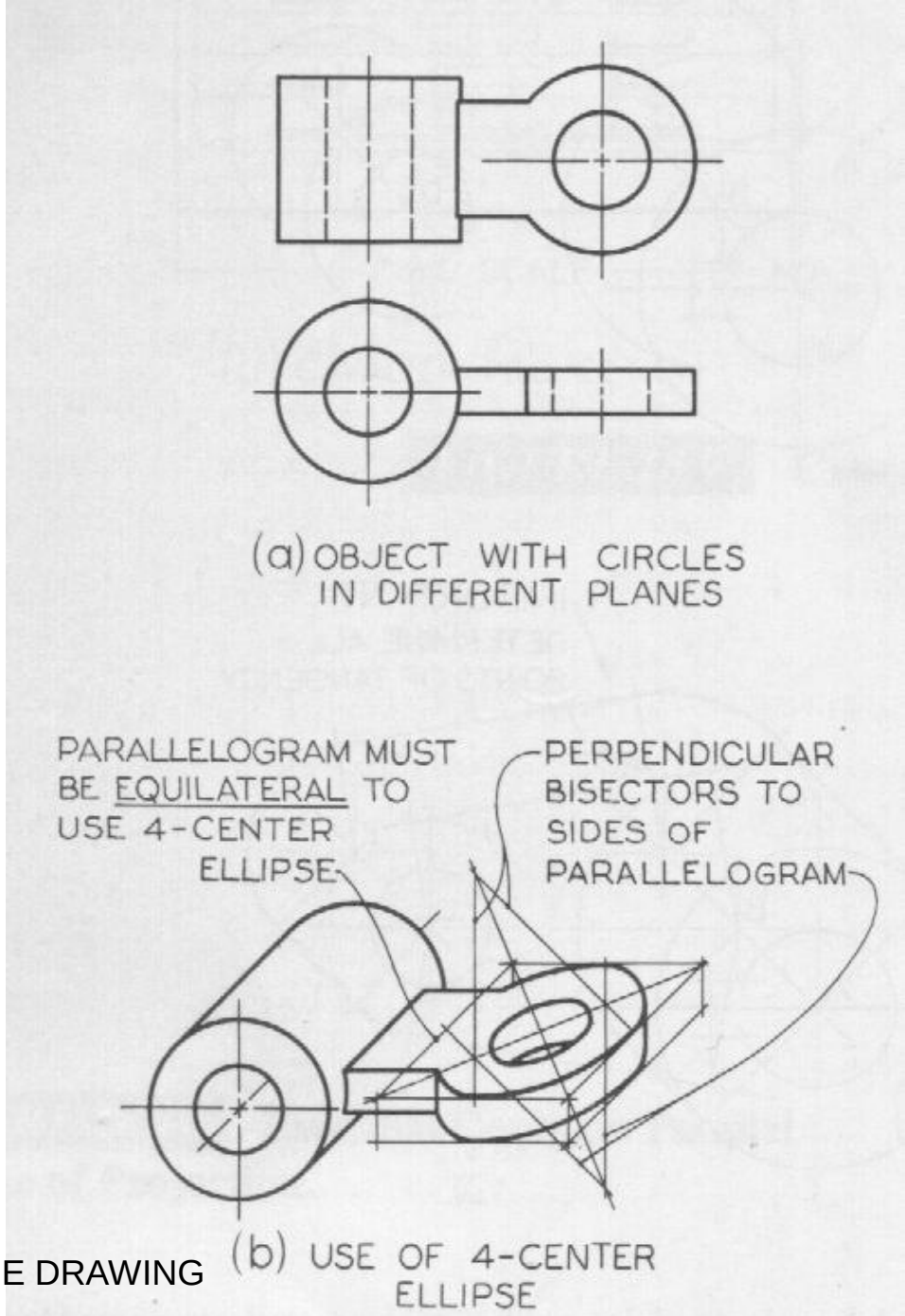


Fig. 6.*9 Circles and arcs not parallel to plane of projection*

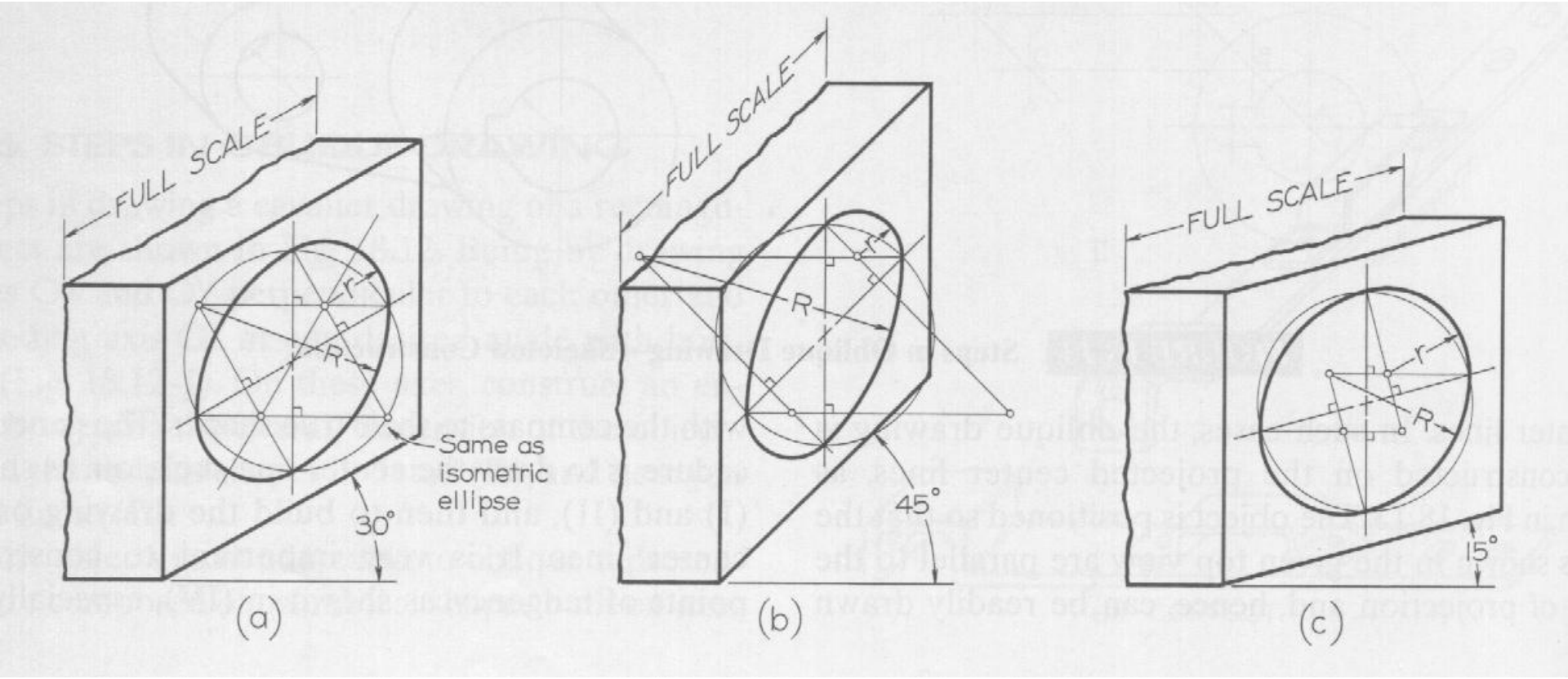


Fig. 6.*10 Alternate four-center Ellipse*

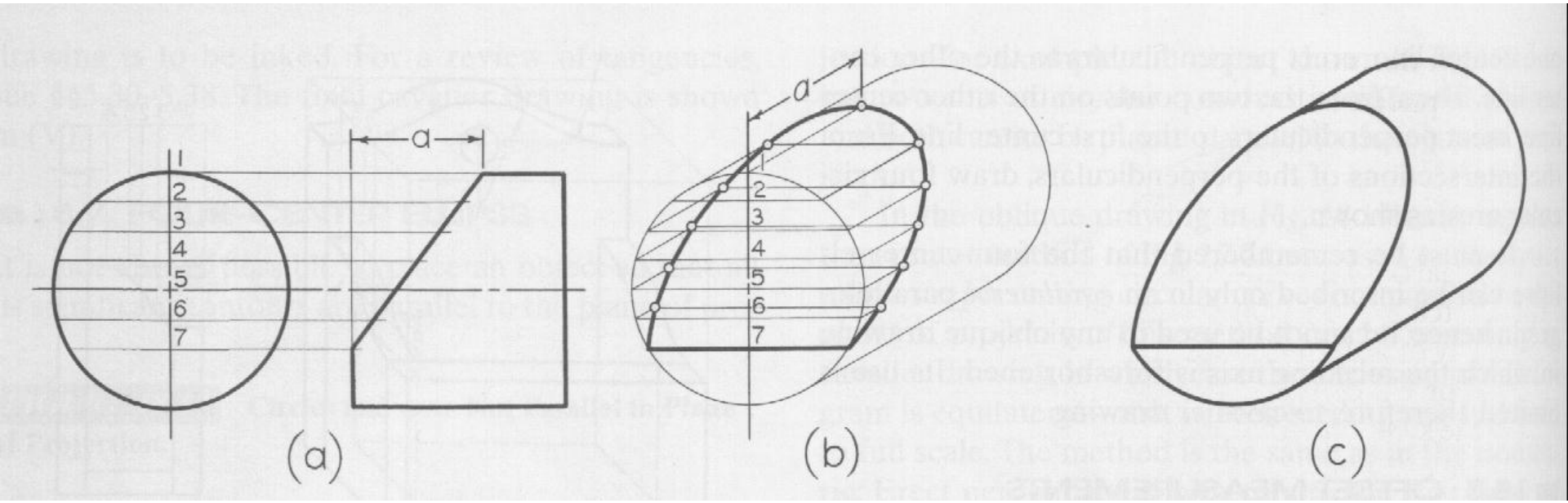


Fig. 6.*11 Use of Offset measurements*