Steps in Drawing Four-Center Ellipse.
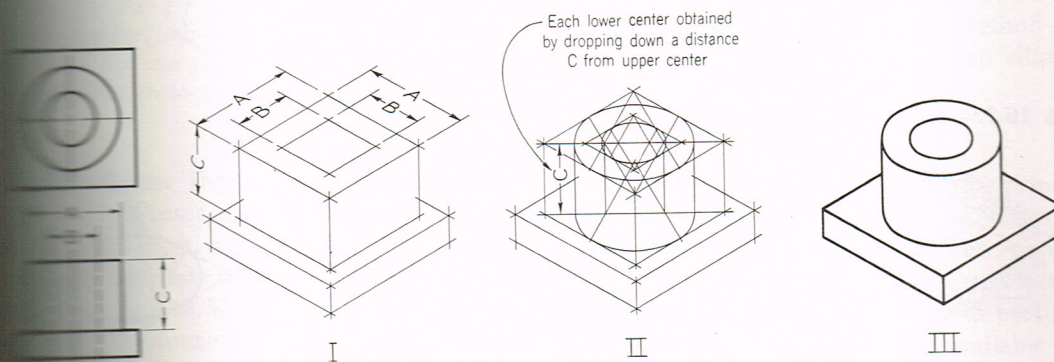
Isometric Drawing of a Bearing.

illustrated in Figs. 16.24, 16.25, and 16.26. It can be used only for ellipses in isometric planes.

To apply this method, Fig. 16.24, draw, or assume to be drawn, a square around the given circle in the multiview drawing; then:

Draw the isometric of the square, which is an equilateral parallelogram whose sides are equal to the diameter of the circle.

Erect perpendicular bisectors to each side, using the 30° × 60° triangle as shown. These perpendiculars will intersect at four points, which will be centers for the four circular arcs.

Draw the two large arcs, with radius R, from the intersections of the perpendiculars in the two closest corners of the parallelogram, as shown.
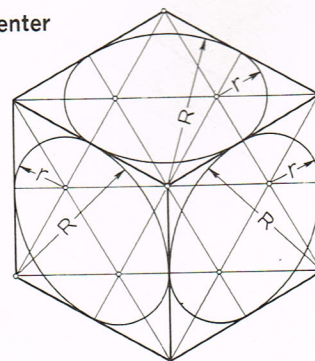
Draw the two small arcs, with radius r, from the intersections of the perpendiculars within the parallelogram, to complete the ellipse. As a check on the accurate location of these centers, a long diagonal of the parallelogram may be drawn, as shown. The midpoints of the sides of the parallelogram are points of tangency for the four arcs.

Isometric drawing with cylindrical shapes is

illustrated in Fig. 16.25. Note that the centers of the larger ellipse cannot be used for the smaller ellipse, though the ellipses represent concentric circles. Each ellipse has its own parallelogram and its own centers. Observe also that the centers of the lower ellipse are obtained by projecting the centers of the upper large ellipse down a distance equal to the height of the cylinder.

The construction of the four-center ellipse upon the three visible faces of a cube is shown in Fig. 16.26, a study of which shows that all diagonals are horizontal or 60° with horizontal; hence the entire construction is made with the T-square and 30° × 60° triangle.

Fig. 16.26 Four-Center Ellipses.

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