Basic Drafting Skills

Lines: Important single entity on technical drawings

Line widths:

0.5 -0.8 mm wide for thick lines

0.3 -0.5 mm wide for thin lines

Visible lines: Visible edges or contours of objects

Hidden Lines: Invisible lines

Lettering: Legible, reproducible and ease of execution

Circles and Arcs: See S-9

Irregular curves: Curved lines

APPLICATION OF LINES

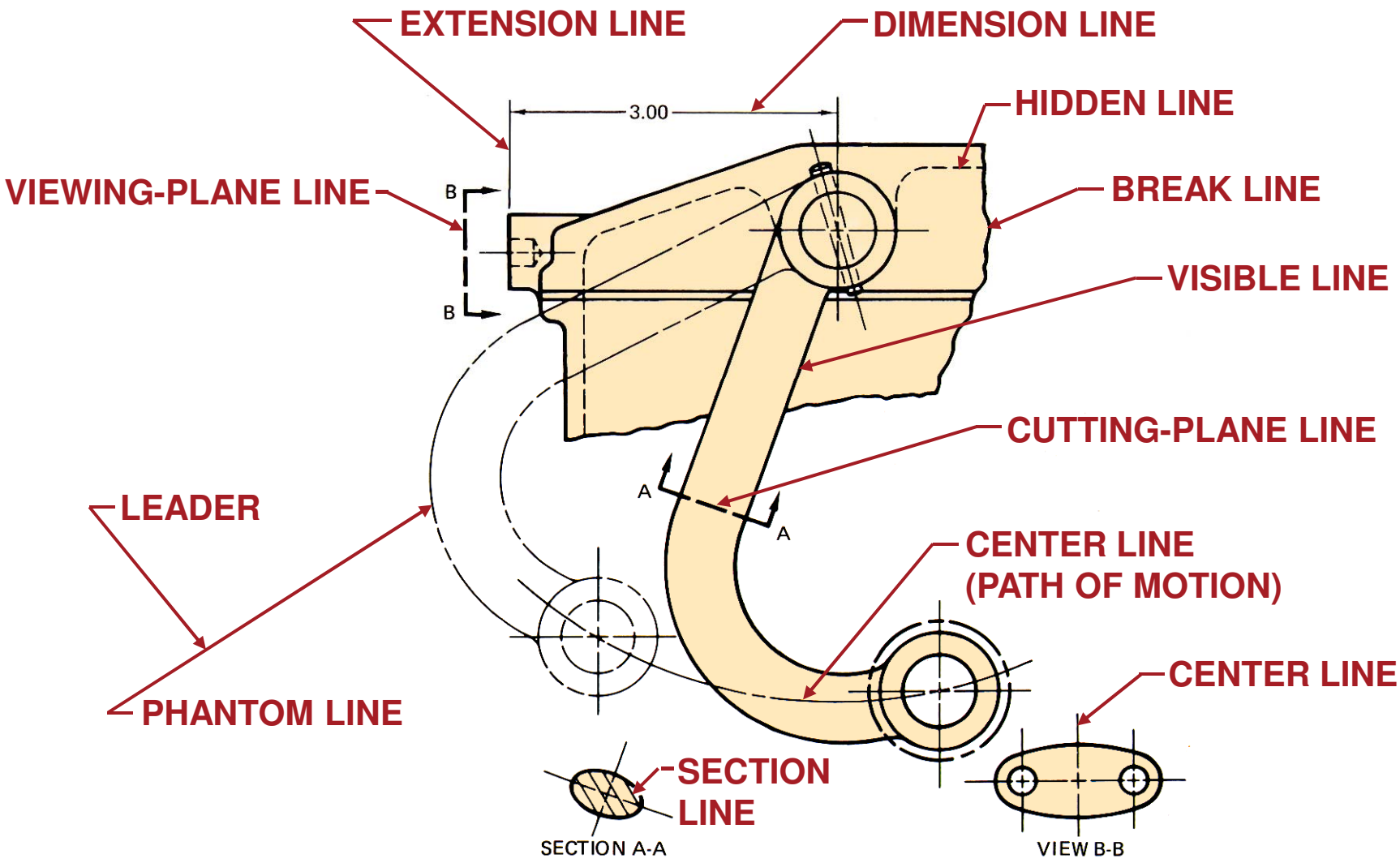
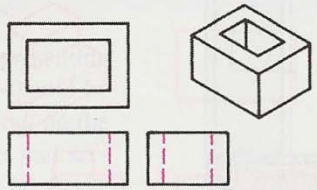
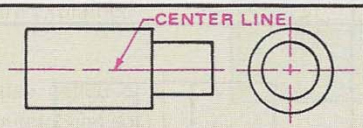
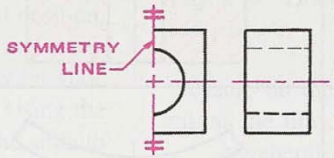
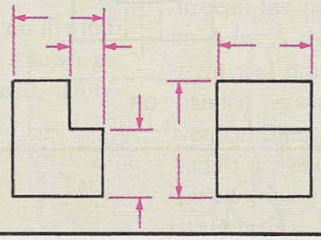
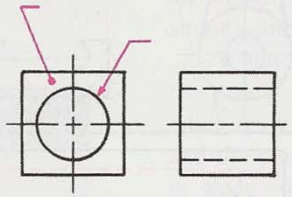
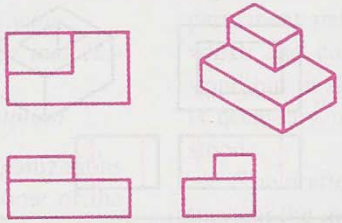
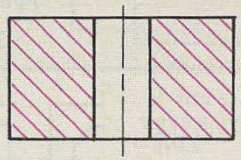
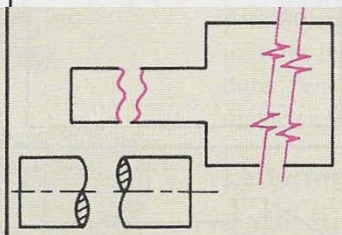
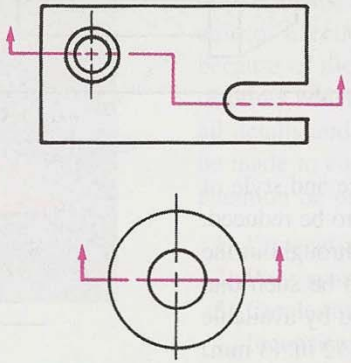


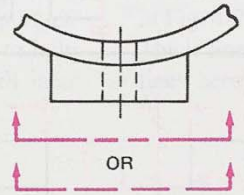
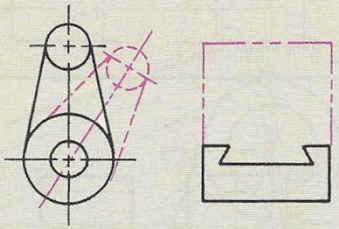
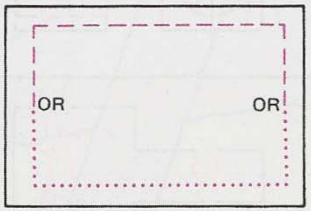
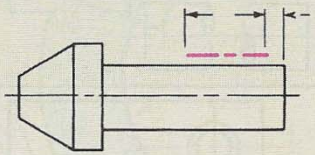
TABLE 4-1 Types of lines. (continued on next page)

Type of Line	Application	Description
Hidden line THIN		The hidden object line is used to show surfaces, edges, or corners of an object that are hidden from view.
Center line THIN ALTERNATE LINE AND SHORT DASHES		Center lines are used to show the center of holes and symmetrical features.
Symmetry line CENTER LINE THICK SHORT LINES		Symmetry lines are used when partial views of symmetrical parts are drawn. It is a center line with two thick short parallel lines drawn at right angles to it at both ends.
Extension and dimension lines THIN DIMENSION LINE EXTENSION LINE		Extension and dimension lines are used when dimensioning an object.
Leaders ARROW DOT THIN		Leaders are used to indicate the part of the drawing to which a note refers. Arrowheads touch the object lines while the dot rests on a surface.

Types of lines

Type of Line	Application	Description
Visible line THICK		The visible line is used to indicate all visible edges of an object. They should stand out clearly in contrast to other lines so that the shape of an object is apparent to the eye.
Section lines THIN LINES		Section lining is used to indicate the surface in the section view imagined to have been cut along the cutting-plane line.
Break lines THIN LONG BREAK THICK SHORT BREAK		Break lines are used when it is desirable to shorten the view of a long part.
Cutting-plane line THICK OR		The cutting-plane line is used to designate where an imaginary cutting took place.

Types of lines

Viewing-plane line THICK OR		The viewing-plane line is used to indicate direction of sight when a partial view is used.
Phantom line THIN		Phantom lines are used to indicate alternate position of moving parts, adjacent position of moving parts, adjacent position of related parts, and repetitive detail.
Stitch line THIN OR SMALL DOTS		Stitch lines are used for indicating a sewing or stitching process.
Chain line THICK		Chain lines are used to indicate that a surface or zone is to receive additional treatment or considerations.

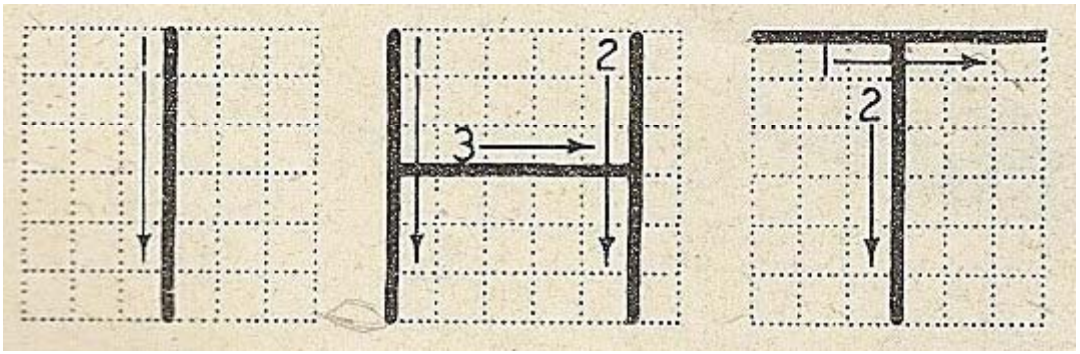
Types of lines

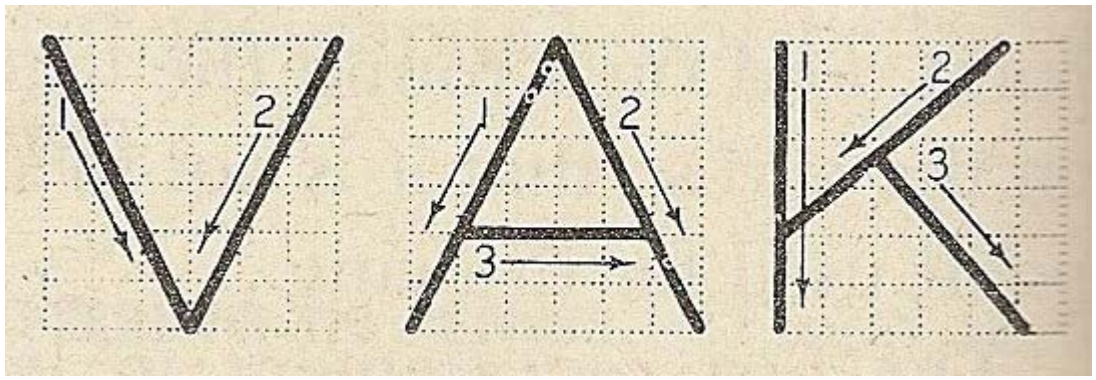
Fig. 4-5 Approved Gothic lettering for engineering drawings.

Fig. 4-6 Microfont letters.

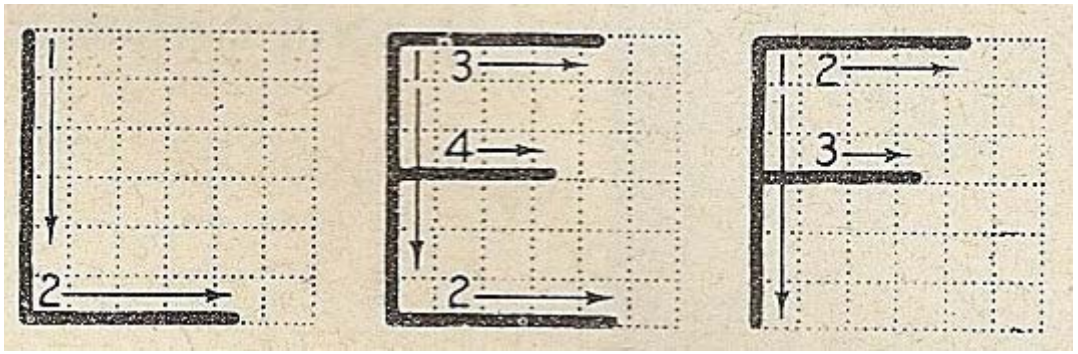
TABLE 4-2 Recommended lettering heights.

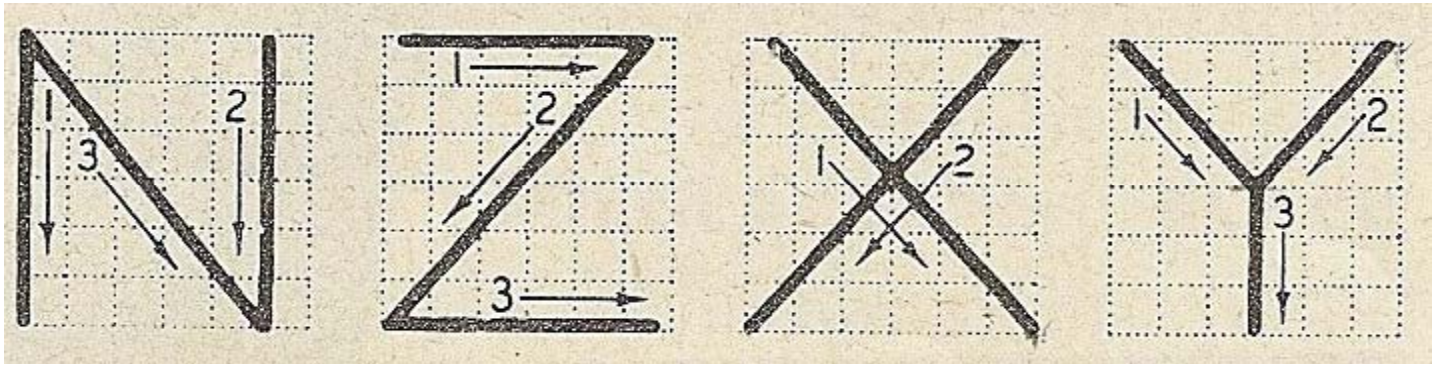
Use	Inch		Metric mm		Drawing size
	Freehand	Mechanical	Freehand	Mechanical	
Drawing number in	0.250	0.240	7	7	Up to and including 17 × 22 inches
Title block	0.312	0.290			Larger than 17 × 22 inches
Drawing title	0.250	0.240	7	7	
Section and tabulation letters	0.250	0.240	7	7	All
Zone letters and numerals in border	0.188	0.175	5	5	
Dimension, tolerance, limits, notes subtitles for special views, tables, revisions, and zone letters for the body of the drawing	0.225	0.120	3.5	3.5	Up to and including 17 × 22 inches
	0.256	0.140	5	5	Larger than 17 × 22 inches

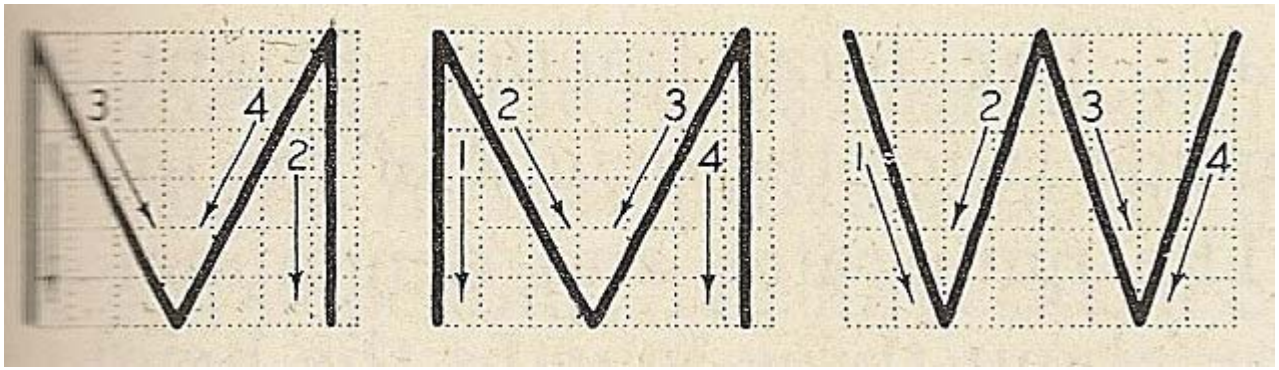




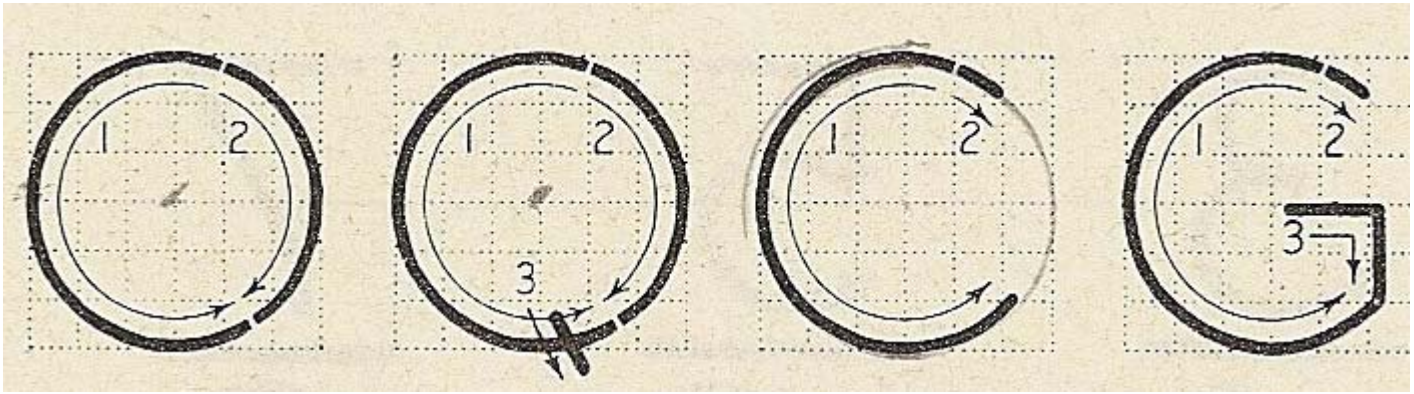
Lettering

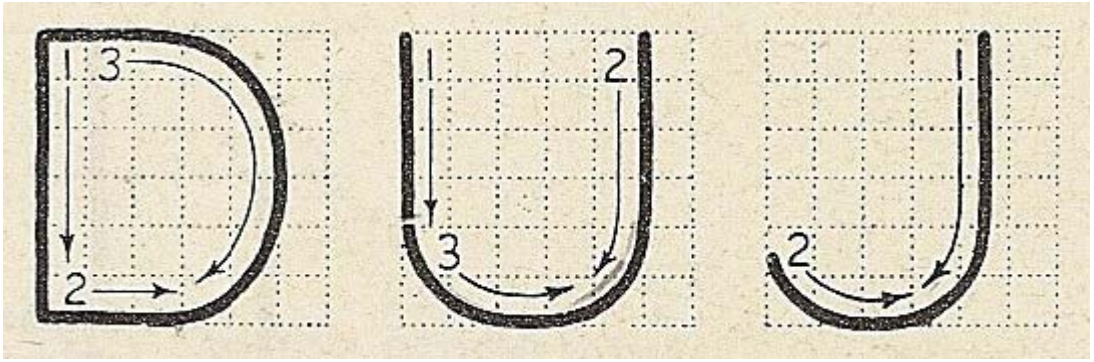


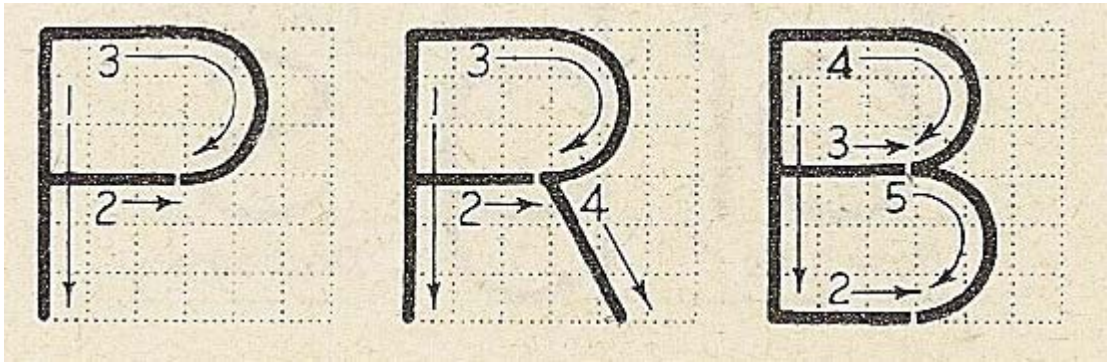




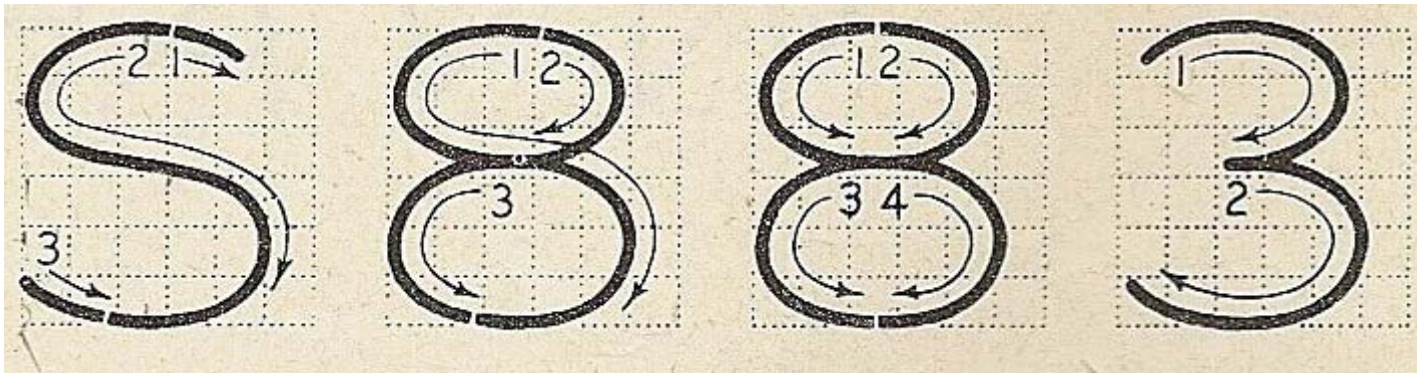
Lettering

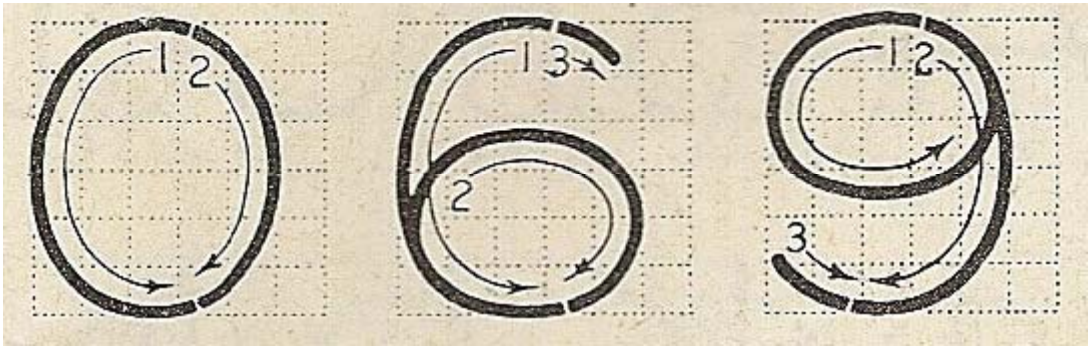


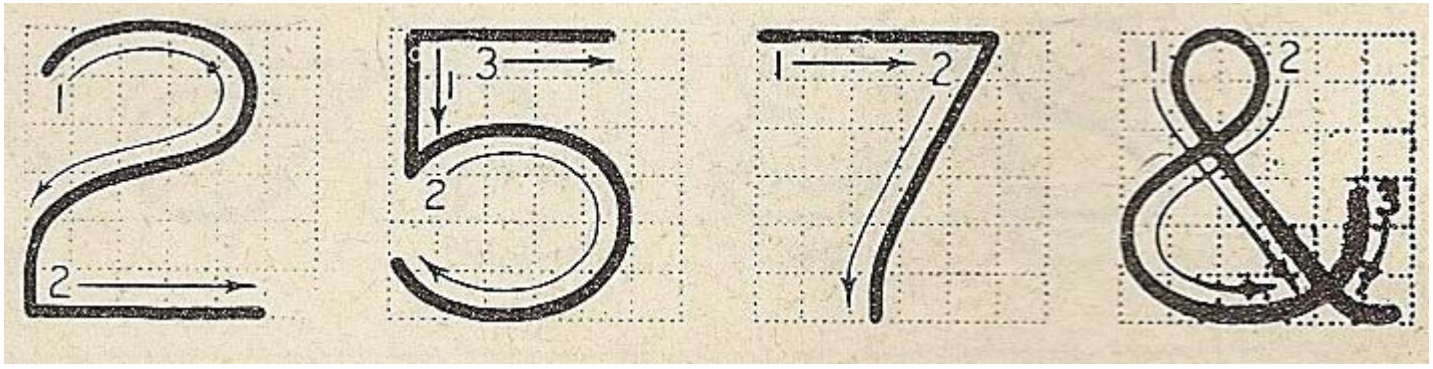




Lettering

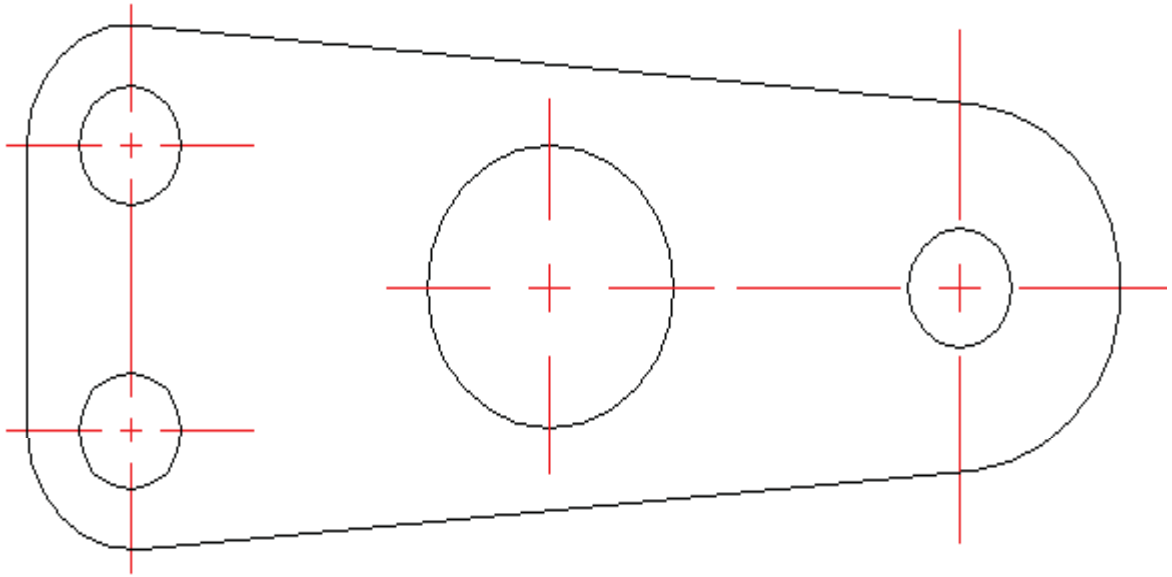






Lettering

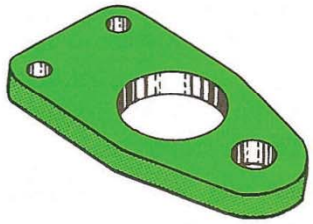
CIRCLES AND ARCS

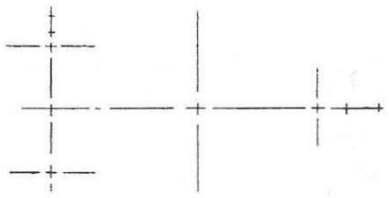


ESTABLISH CENTER LINES

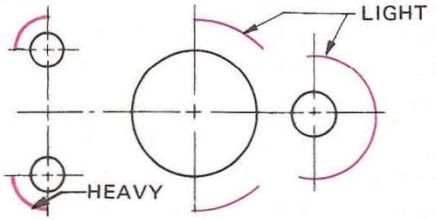
DRAW CIRCLES AND ARCS

COMPLETE OBJECT LINES

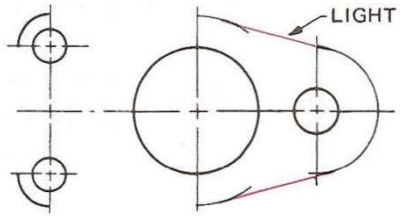




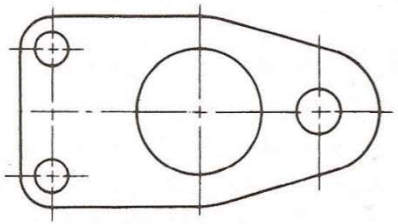
(A) ESTABLISH CENTER LINES AND RADII MARKS



(B) DRAW CIRCLES AND ARCS



(C) DRAW TANGENT LINES



(D) COMPLETE VISIBLE LINES

Fig. 4-16 Sequence of steps for drawing a view having circles and arcs.

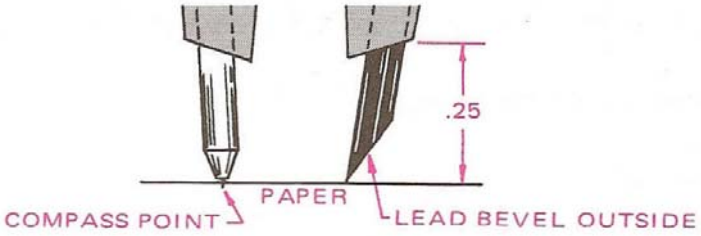


Fig. 4-17 Sharpening and setting the compass lead.

Drawing circles on views

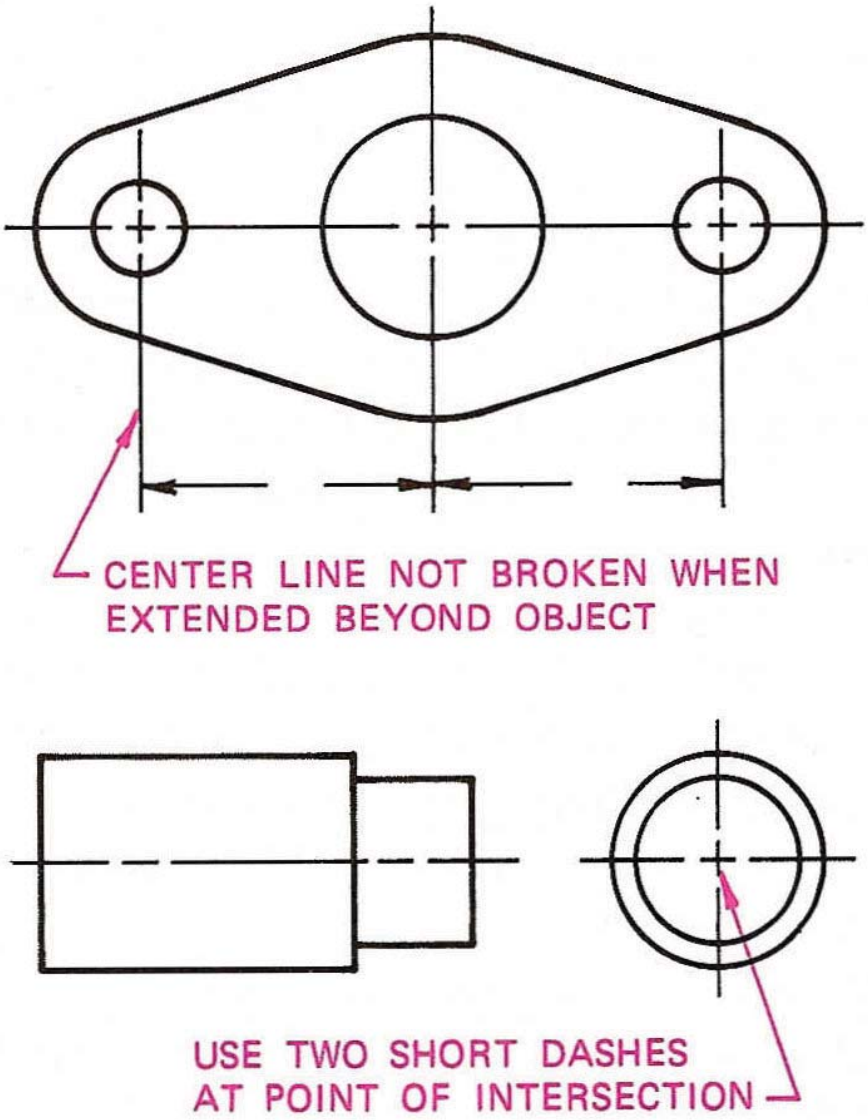


Fig. 4-14 Center line technique.

Circles and centerlines

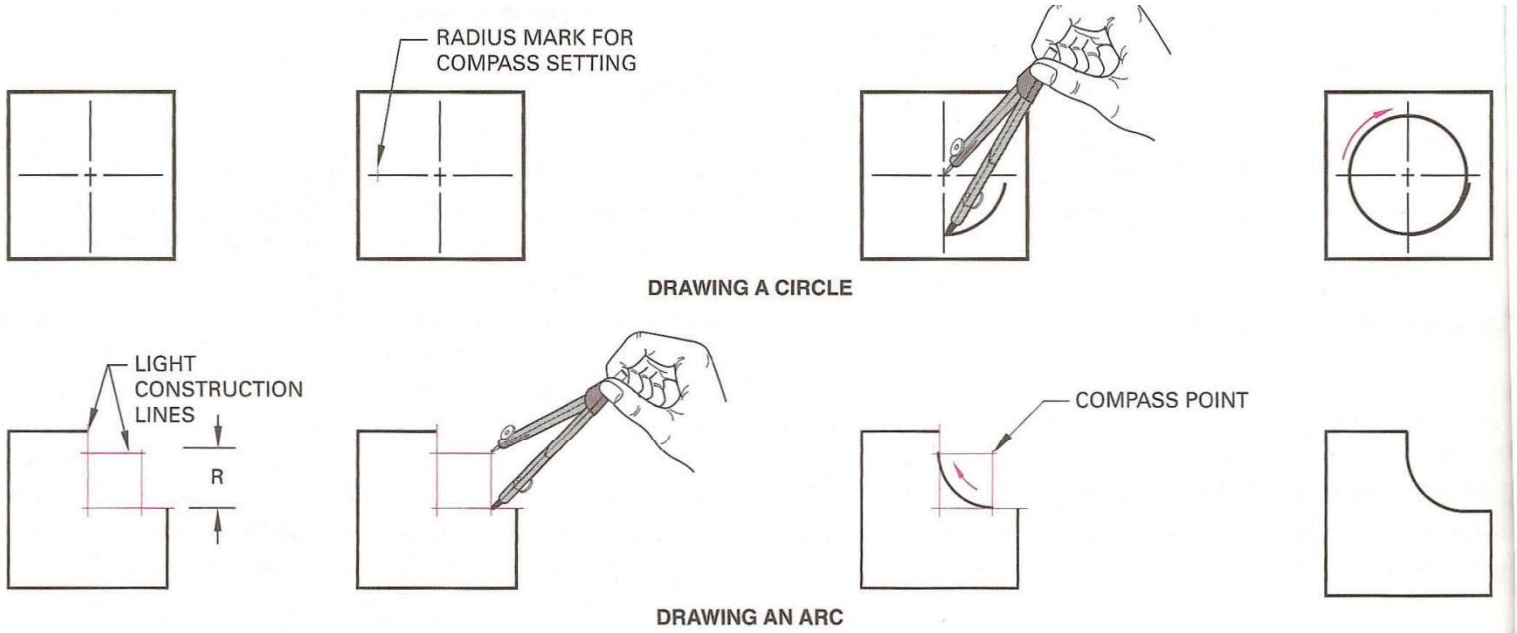
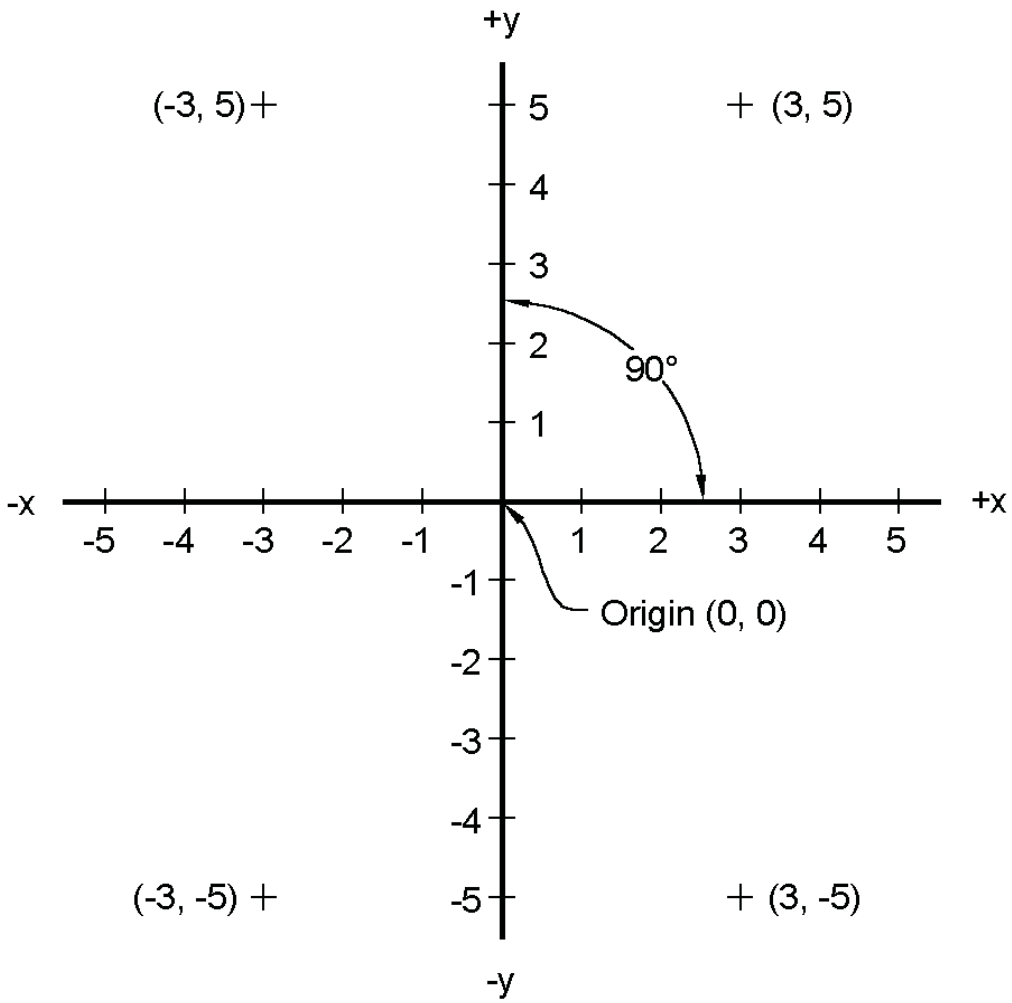


Fig. 4-15 Drawing circles and arcs.

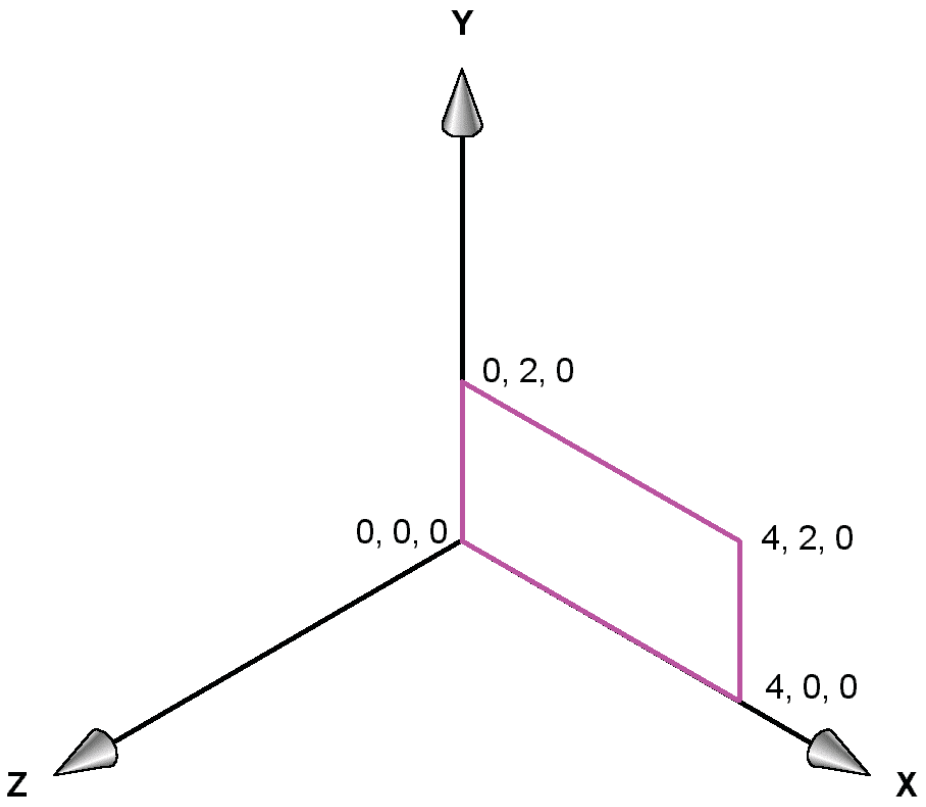
Drawing circles

COORDINATE SYSTEMS



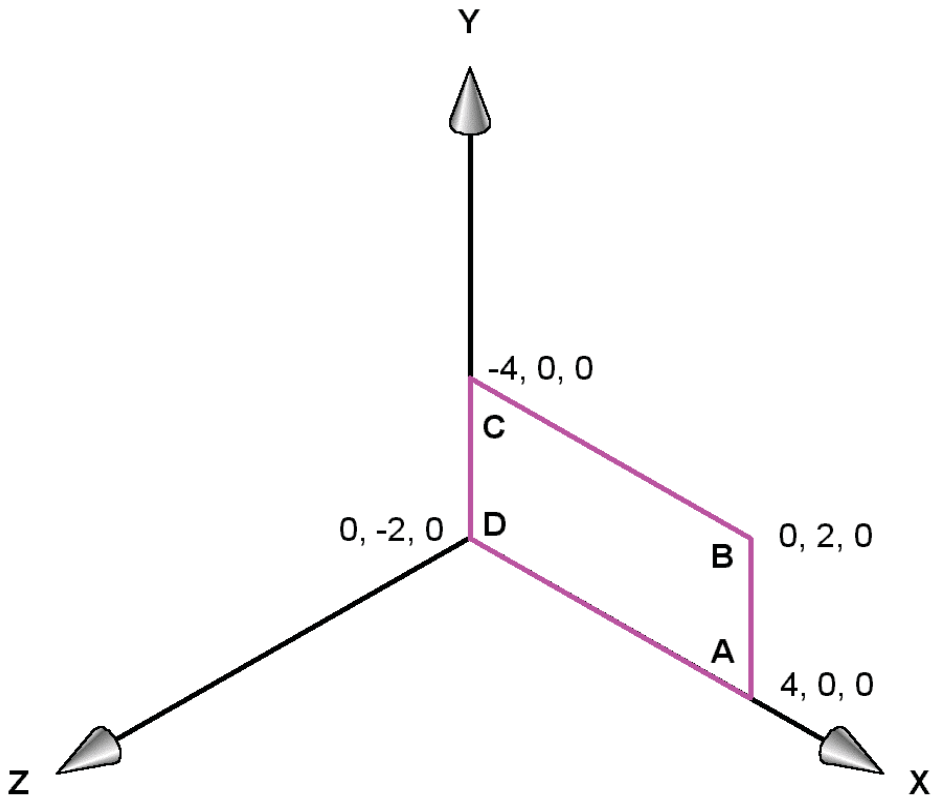
CARTESIAN COORDINATES

COORDINATE SYSTEMS



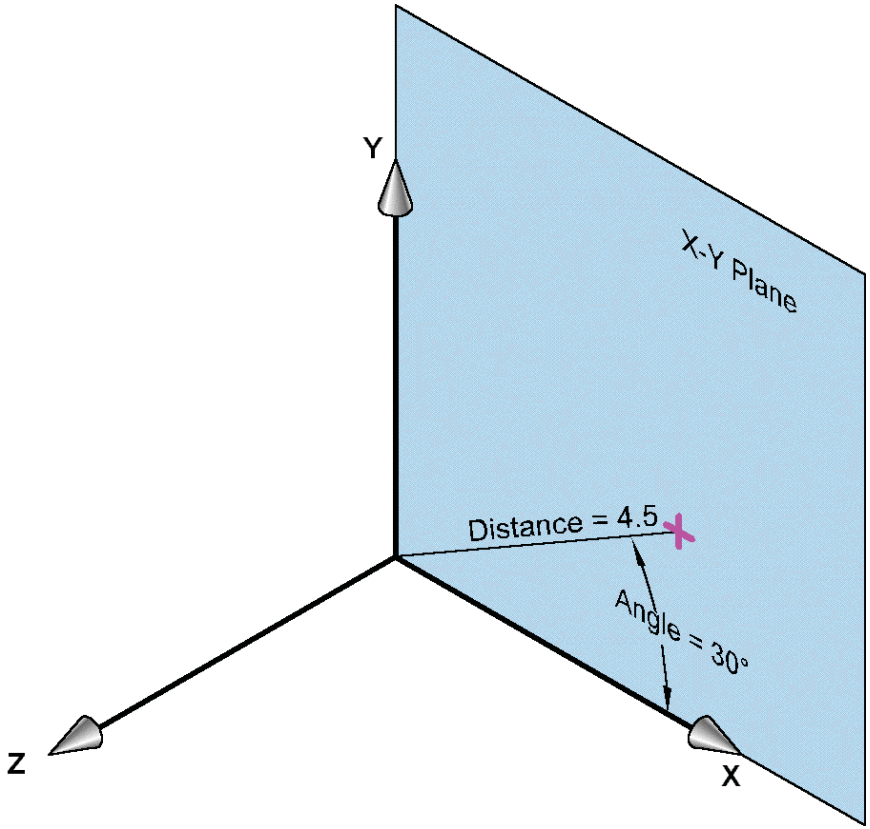
ABSOLUTE COORDINATES

COORDINATE SYSTEMS



RELATIVE COORDINATES

COORDINATE SYSTEMS



POLAR COORDINATES

HIDDEN LINE TECHNIQUE