

Joint Beginning and Intermediate Engineering Graphics
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Final Review

1st Topic. Orthographic Working Drawings

Three-view Projection:

1. Between Top and Front Views, project dimensional points up and down (using Extension Line tool, and End and Intersection Osnaps);
2. Between Side and Front Views, project dimensional points left-ward and right-ward (using Extension Line tool, and End and Intersection Osnaps);
3. Between Top and Side Views, draw a 45-degree miter line to help projecting dimensional points (using Extension Line tool, and End and Intersection Osnaps);

Auxiliary View:

Auxiliary view is drawn when the true shape of a slanted face is needed (This does NOT mean that whenever there is a slanted face, you absolutely need to draw an auxiliary view. It ALL depends on manufacturing requirements). Auxiliary views can be full, partial or broken. It is ONLY necessary to draw a PARTIAL auxiliary view to show the TRUE SHAPE of the slanted face (which is “foreshortened” or distorted in regular three-views). A full auxiliary view will show non-slanted face as “foreshortened”.

To draw an auxiliary view:

1. Project straight lines off the endpoints of the slanted edge of one view that shows the edge line in true length to get the first set of true dimensions;
2. Borrow the other set of true length dimensions from one of the other views;
3. Find the appropriate corresponding points to draw lines.

Remember: the shape of the auxiliary view is similar to a “foreshortened” shape in a regular view, but shows the TRUE length and true shape.

2nd Topic. Presentation Drawing (Isometric):

1. Use F5 key to change IsoPlanes;
2. Use Ortho (F8) to do DDE inputs for all lines and construction lines along the X-, Y-, and Z-Axes (Isometric Lines); and then draw the Non-isometric lines (using End, Int and other Osnaps);
3. For Isometric circles within a bounding box, major axes go to smaller angles, minor axes go to larger angles; the major axes of three iso circles on three isoplanes form a triangle. Use Ellipse>Isometric Circle command to draw iso circles on the three iso planes. For iso circles NOT located on any iso planes, draw a bounding box, use MID Osnaps and Ellipse tool to draw the iso circle;
4. For fillets on iso drawings, the arcs go in the same direction as the arc representing the fillet on the edge.

3rd Topic. Descriptive Geometry (Development and Intersection):

1. The development of most simple geometric solids include a lateral (side) surface, a top, and a base (bottom). Development is used in sheet metal construction (piping, air conditioning, ventilation, etc.). For objects to be built, extra materials called seams and lapses are needed;
2. Same principle of projecting two sets of dimensional points from two views work in the drawing of intersection and development.

4th Topic. AutoCAD Hints

Dimensioning:

Remember to use End, Int and other Osnaps;

DO NOT use Leader tool to dimension circles or arcs, use Diameter and Radius tools instead (arrow automatically points to the center).

Linetype Scale:

Use this tool to scale hidden, center and phantom lines (for individual line, double-click or mo, Enter→Properties). Type ltscale, Enter to change the linetype scale across the board.