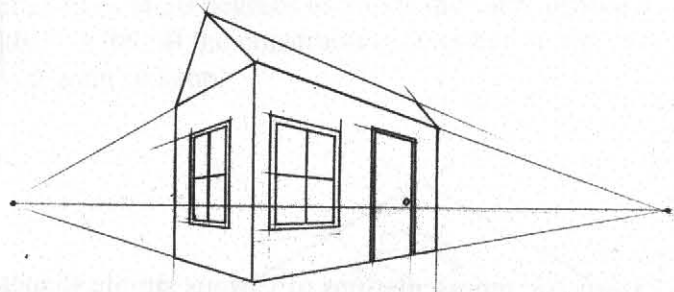
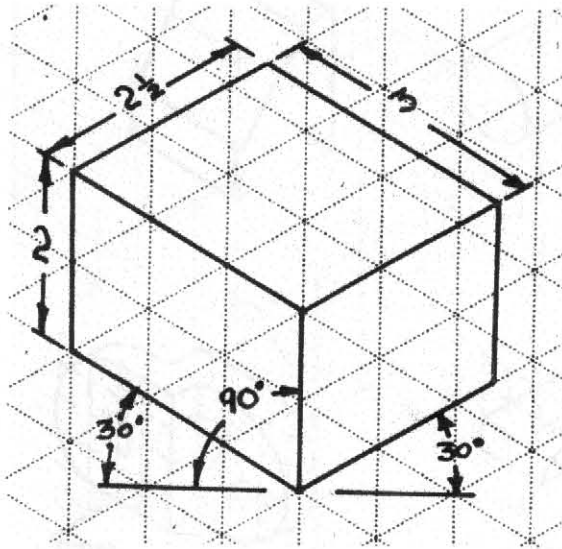


## Isometric Drawing

When we view large objects in a room or outdoors, we generally see a perspective view. Objects are smaller as they get further away. One way to represent this on paper is a 2-point perspective drawing. Lines trailing off into the distance converge to a point.



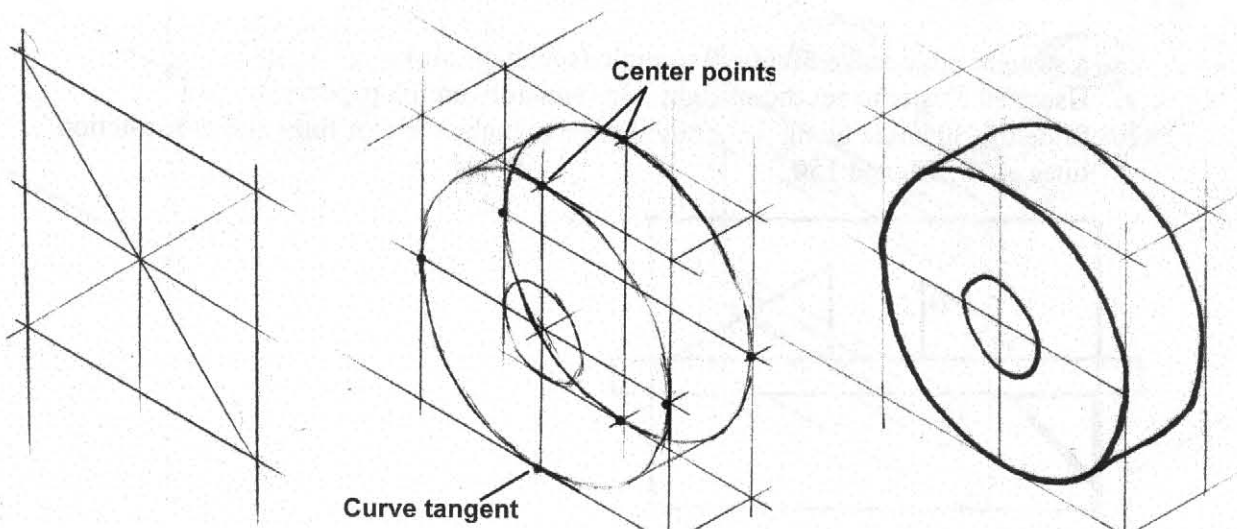
Perspective Drawing



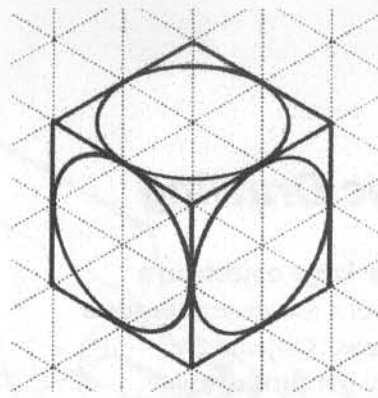
We view most smaller items from a far enough distance that the perspective is hard to notice. There is an easier way to represent these objects with an **Isometric Drawing**.

The part is held with one vertical edge, then tilted toward the viewer until the other horizontal edges diverge at a 30 degree angles. All three axes are scaled uniformly. Because all lines are parallel, isometric drawings can be created quickly.

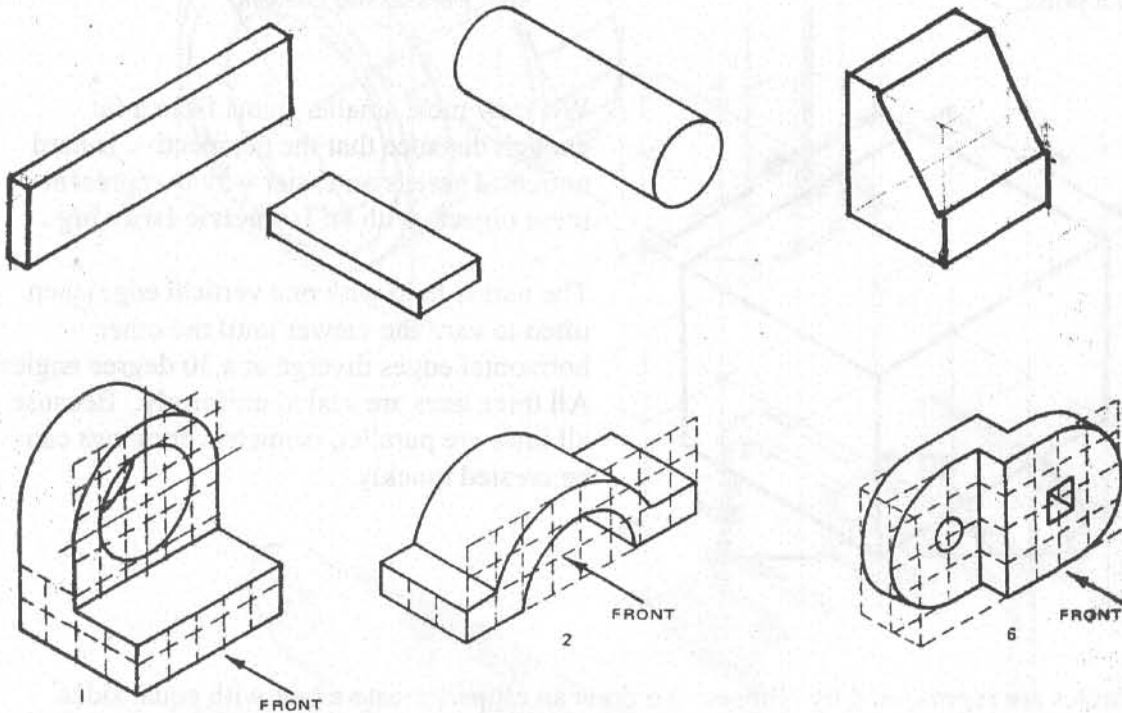
Circles are represented by ellipses. To draw an ellipse, create a box with equal sides. Draw center points on each edge (Hint: to find the center point, draw diagonals to each corner.) Connect the points with an ellipse, keeping the curve tangent to the box at the center points marked. To create a cylinder, connect 2 ellipses with tangent lines parallel to the appropriate axes. Marker over the lines you want, then erase construction lines.



Elipses in other planes.

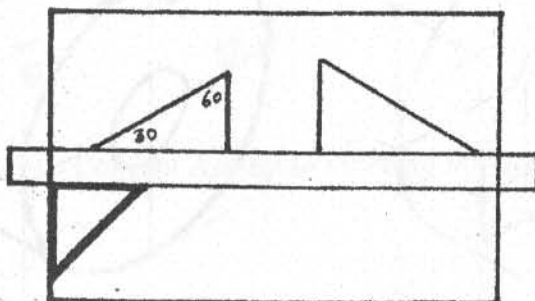


Isometric representations of various simple shapes:

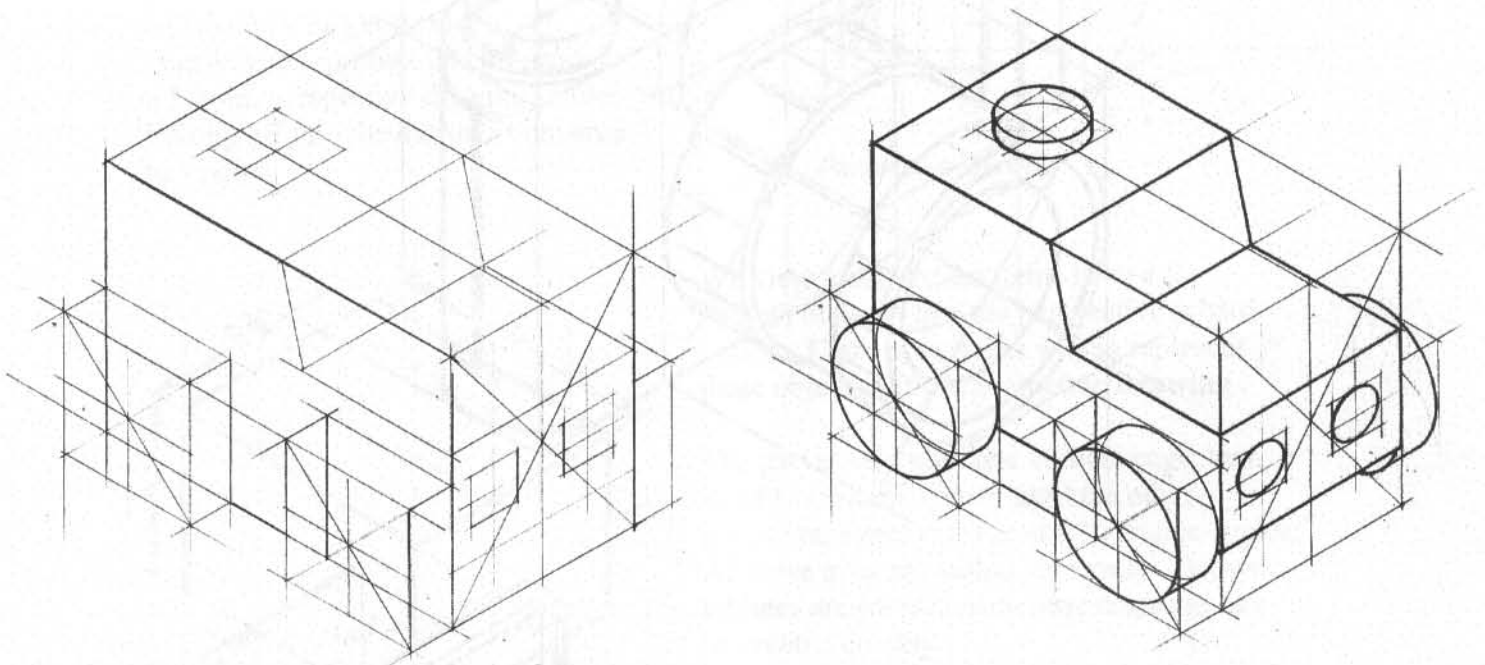


Two ways to create an isometric drawing:

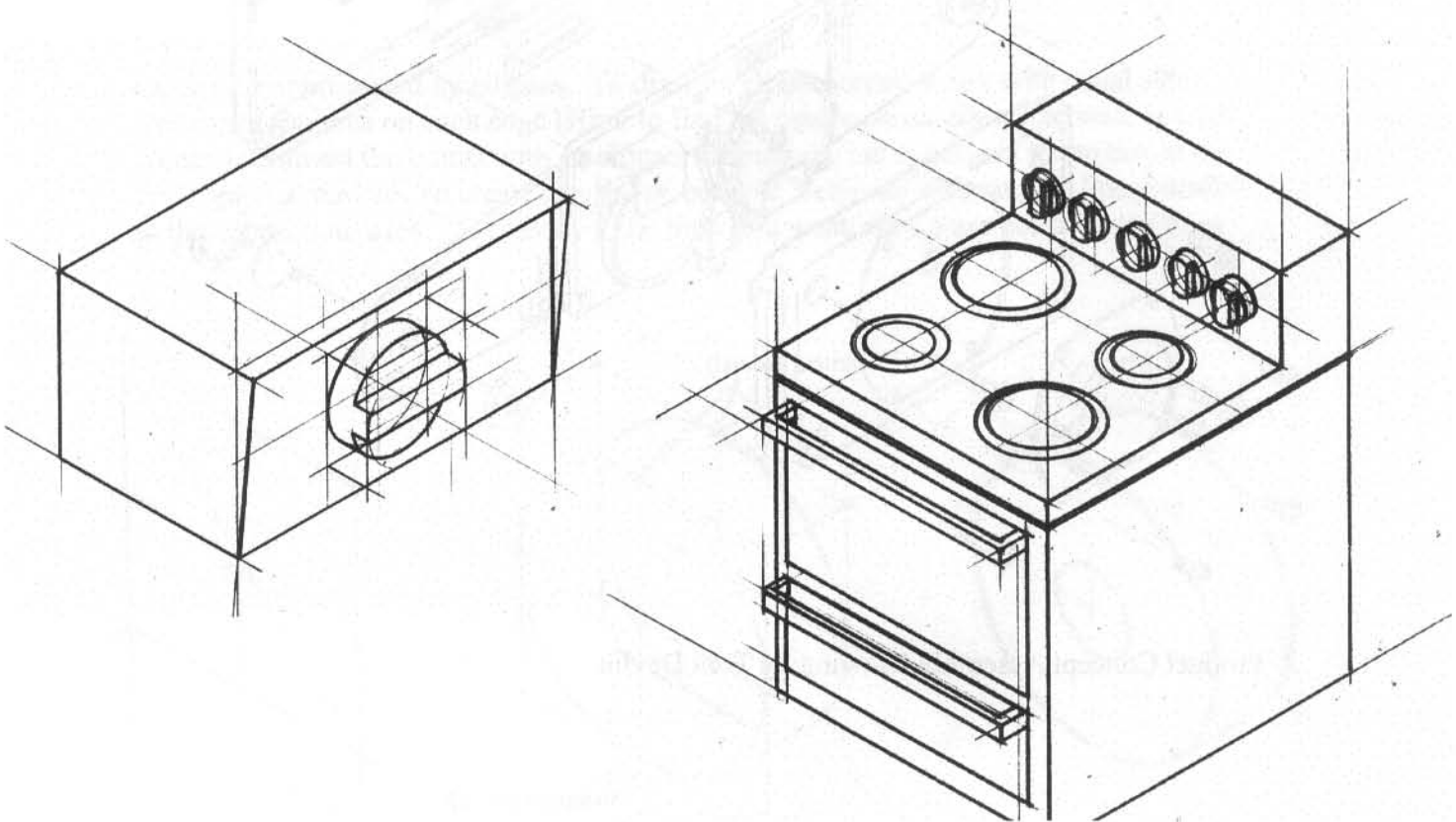
1. Use isometric grid paper (30, 90, 150 lines) or underlay paper to provide the axes and sketch the object.
2. Use a straight edge and a 30/60/90 triangle (see diagram.)
  - a. Use a 90 corner to set the straight edge squarely on the paper.
  - b. Slide the 30 angle along the straight edge to make the part lines and construction lines at 30, 90, and 150.

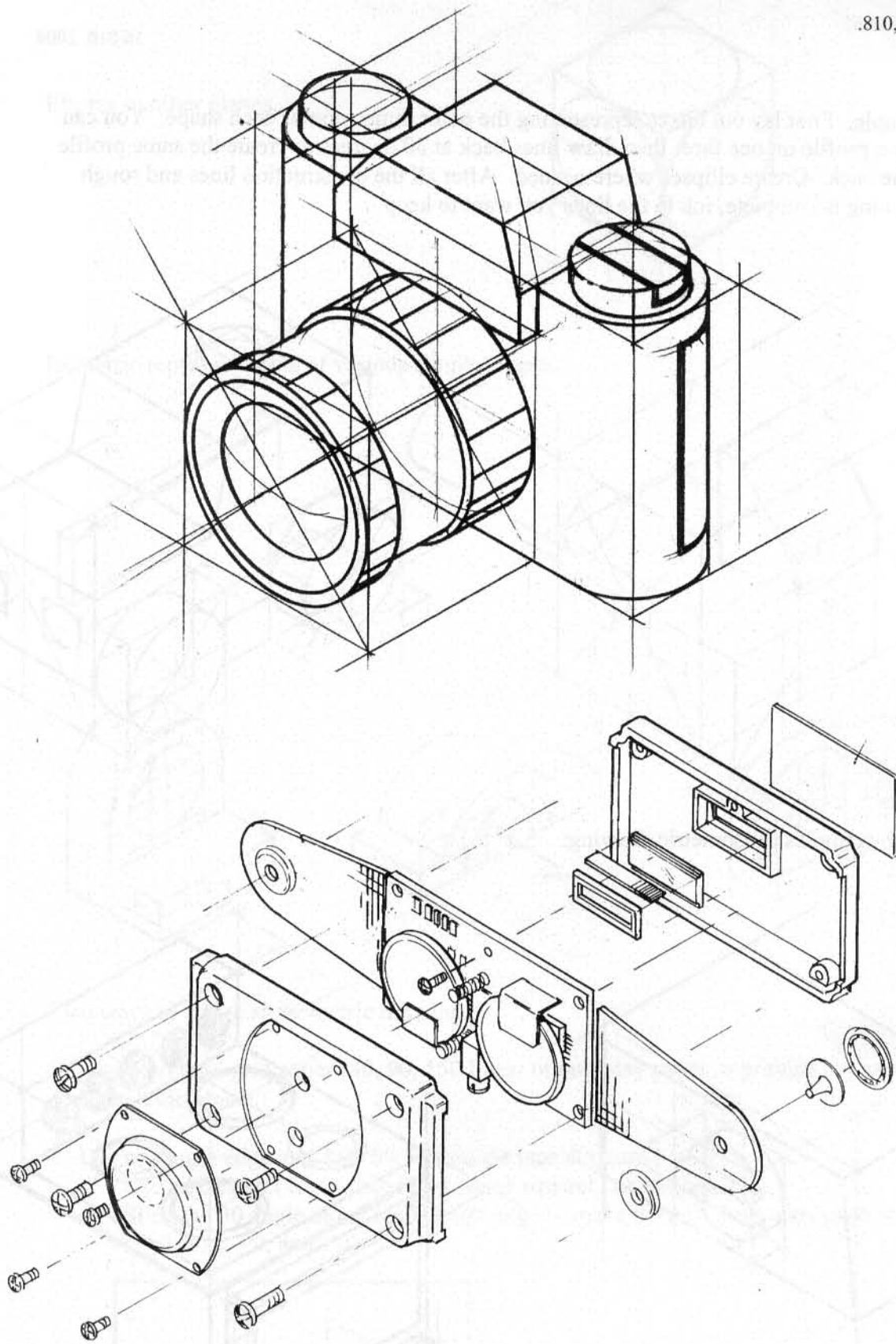


Example: First lay out boxes representing the outer dimension of each shape. You can draw a profile on one face, then draw lines back at 30 degrees to create the same profile on the back. Create ellipses where needed. After all the construction lines and rough sketching is complete, ink in the lines you want to keep.



Other examples of isometric drawing:





Product Concept Assembly Drawing by Tom Devlin