

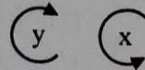
Problem #1 35 points

The pictorials of two objects are shown in the figure below.

- a. Sketch an isometric view of the result when Object A is rotated around the z-axis by $+90^\circ$.

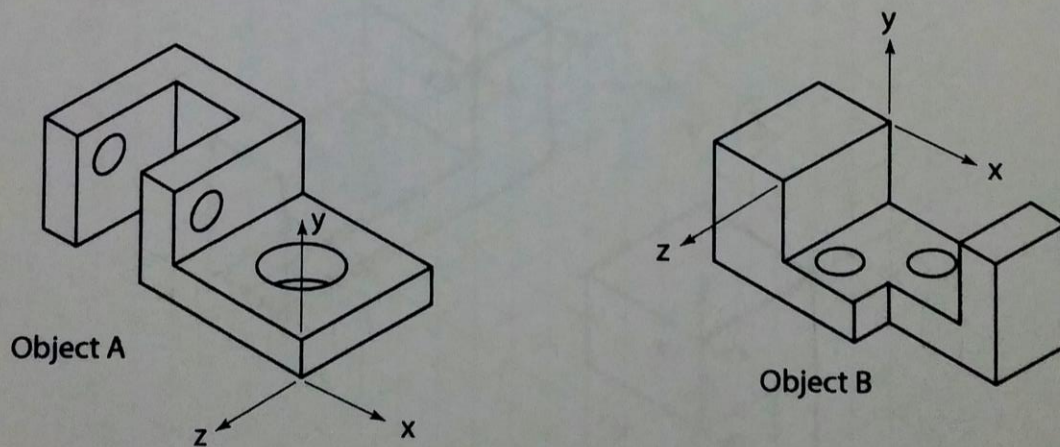


- b. Sketch an isometric view of the result when Object B is rotated around the y-axis by -90° , and then about the x-axis by $+90^\circ$.



- c. Sketch an isometric view of the resulting union of A and B after the rotations in (a) and (b) have been performed.

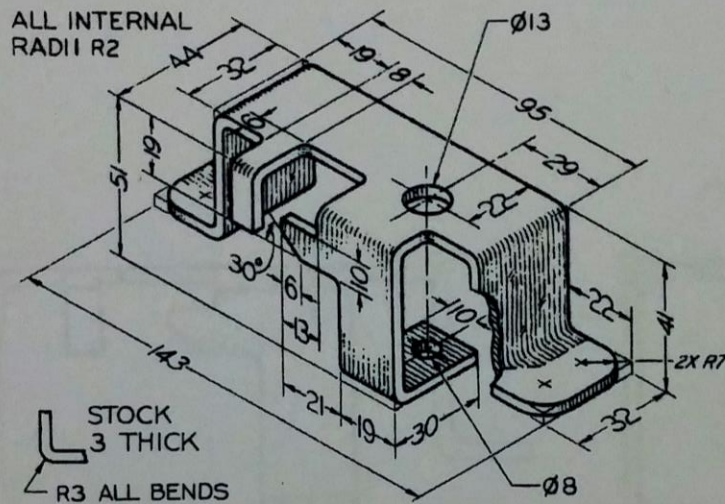
The orientations of the x-y-z axes are to remain the same in all views.



For all pictorial sketches on this exam, shading of surfaces is recommended, but not required.

Problem #2 30 points

The figure below shows a pictorial drawing of a bracket. The pictorial shows the front, top and right sides of the bracket. The small breakout on the right side does not actually exist. It is included only to reveal additional detail. Sketch a multi-view drawing of the bracket showing the front, top, **bottom**, and right side views, with sufficient hidden lines to fully define the geometry of every feature. Center-lines and center-marks must be used when needed. Exact sizes are not required, but reasonably accurate proportions are expected. **Use 1st angle projection.**



For all pictorial sketches on this exam, shading of surfaces is recommended, but not required

Problem #3 35 points

The figure below shows the left side and front views of a 3-dimensional object (in third angle projection).

- On the figure below, add the top, bottom, and right side views. There is no need to add dimensions to the views; however, hidden lines, center-lines and center-marks must be included.
- Create an isometric pictorial that shows the front, top, and right side views of the object.
- Create an isometric pictorial that shows the back, bottom, and left side views of the object.

