E 28, Midterm Examination #1, Fall 1993

Name _____

Section # _____

Open Note Examination

Time Limit: 50 minutes

Total Points Available: 100

4 problems, 25 points each

Scores:

1. _____

2. _____

3. _____

4. _____

Total: _____

Problem #1

The figure below shows an isometric view of a tooling block. All of the holes go completely through the object. Using standard orthographic views *with* hidden lines, determine the minimum number of views required to fully define the object for an engineering drawing. Clearly sketch the views below, as they would appear on a drawing. The sketch does not need to be scaled or dimensioned.
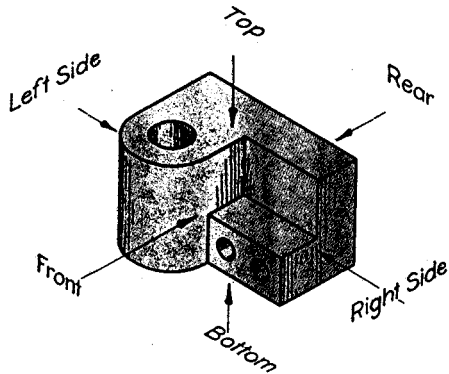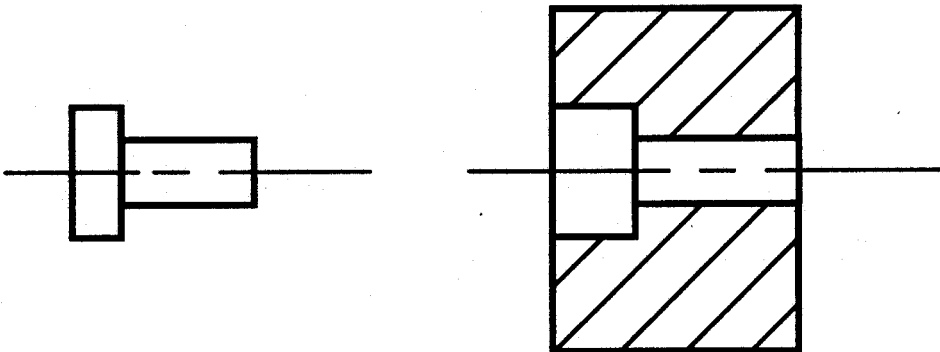
Problem #2

The drawing below shows the front and top views, *with* hidden lines, of a flange. Sketch clearly below an enlargement of a front view, *without* hidden lines, with a half section through A-A. The sketch does not need to be scaled or dimensioned.
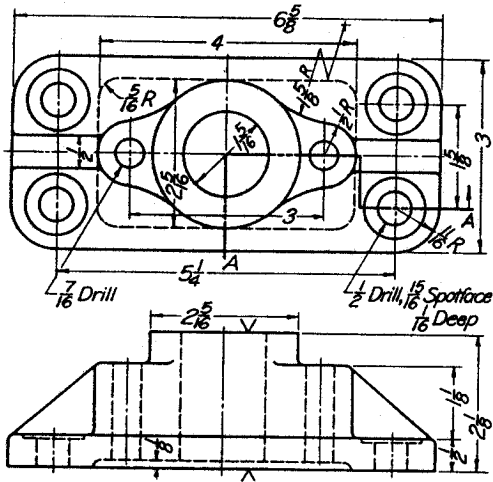
Problem #3

The pin assembly shown below requires a minimum line-to-line interference fit on the smaller diameter, and a minimum line-to-line clearance fit on the larger diameter. The nominal diameter of the bore and counterbore are $\phi 5$ mm and $\phi 10$ mm, respectively. The tolerances on all diameters are ± 0.02 mm. Assume that concentricity is the only important feature other than the tolerances on the diameters (e.g. negligible straightness, perpendicularity, etc.). The tightest concentricity that can be held for both parts is 0.01 mm.

a) (5) Determine the minimum nominal size of diameter A, the small pin diameter, e.g. $\phi A \pm 0.02$.

b) (10) Determine the maximum nominal size of diameter B, the large pin diameter, e.g. $\phi B \pm 0.02$.

c) (10) Properly label, on the figure below, both the pin and bores to show the above dimensions, tolerances, and control features. Use the largest allowable tolerances for concentricity.

Problem #4

The engineering drawing shown below depicts the front, side, and top views of a bracket. Sketch an isometric rendition of the bracket. The sketch does not need to be scaled.