

Name _____ Section # _____

SID # _____

Engineering 25
Fall Semester 2018
Final Examination

Read the instructions carefully and make sure you answer all parts of each question.

Print your full name on top of every page, even if it is unused.

Time Limit: 3 hours
Closed Book Exam

Problem 1 _____ /20

Problem 2 _____ /15

Problem 3 _____ /15

Problem 4 _____ /20

Problem 5 _____ /20

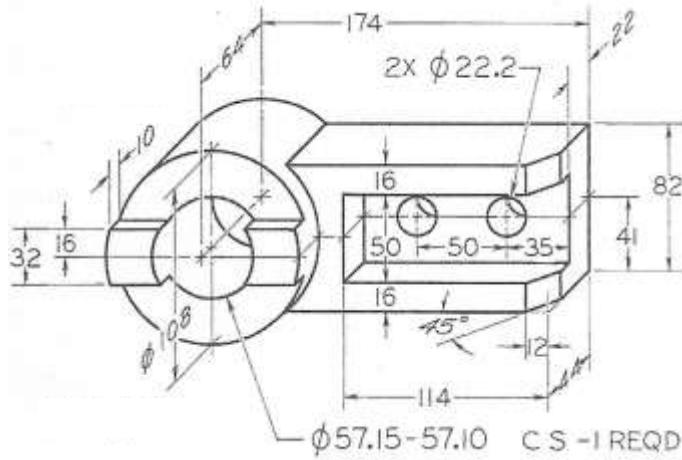
Problem 6 _____ /10

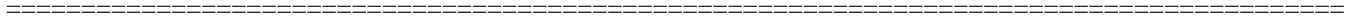
TOTAL EXAM SCORE _____ /100

Problem 1 (20 points)

The figure below shows a pictorial drawing of a lever hub. The pictorial shows the front, top and right sides of the part. Sketch a multi-view drawing of the bracket, using **1st angle projection**, showing the front, top, and right side views. Use sufficient hidden lines to ensure defined 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. You do not need to show the dimensions.

Use 1st angle projection.

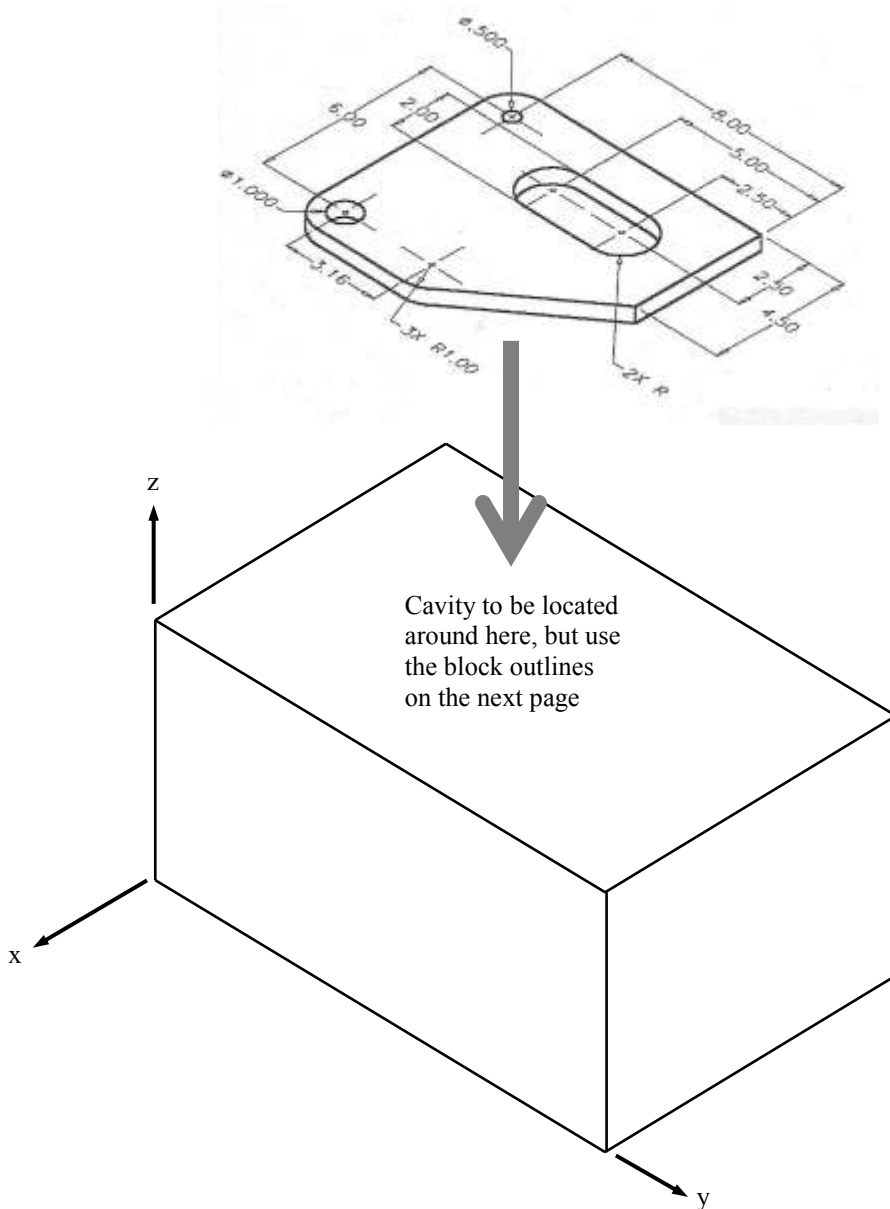


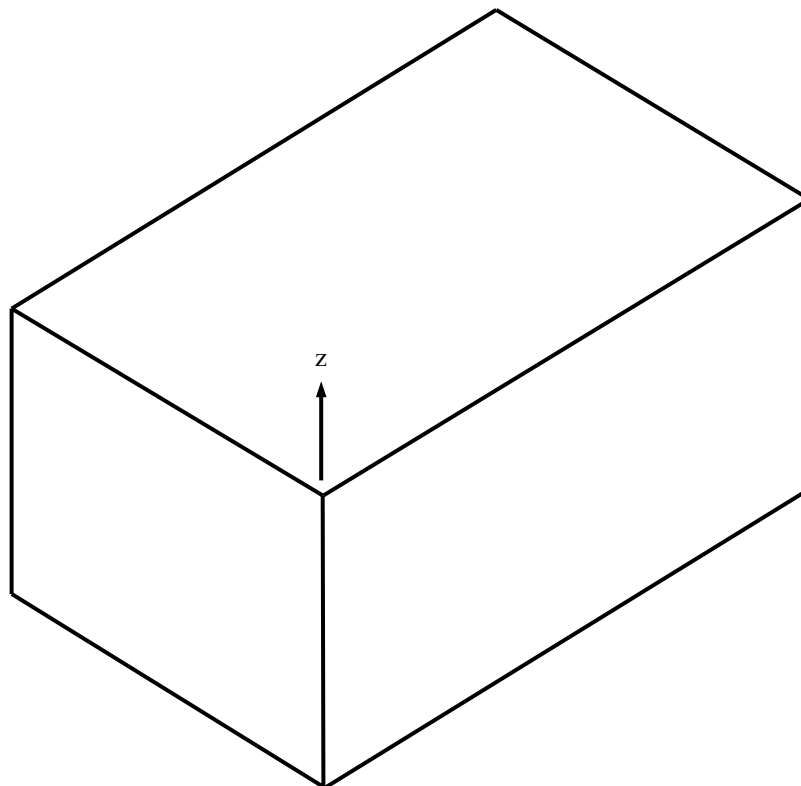
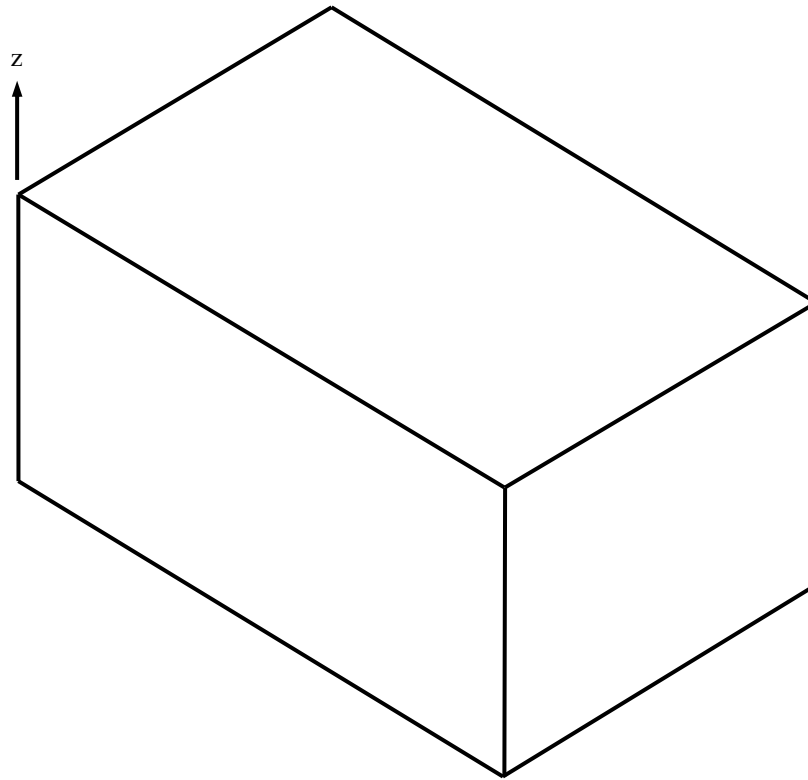


Problem 2 (15 points)

The figure below shows a pictorial drawing of cover plate. The pictorial shows the front, top and right sides of the part. It is desired to make this object using a casting process, so a mold cavity must be made by performing a Boolean subtraction of the object from the rectangular block shown, such that the part is approximately in the center of the top surface of the block, and the top of the part is co-planar with the top of the block.

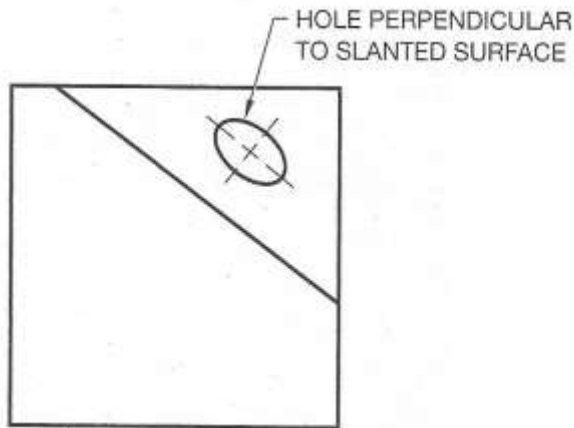
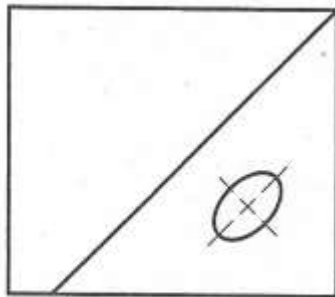
- a) Sketch an isometric view of the mold that shows the cavity created by subtracting the part from the block. The position of the block is already started on the isometric sketching grid. Do not show the hidden lines.
- b) Sketch another isometric view of the mold after it has been rotated by positive 90° about the z-axis from the position in part (a). The position of the block is already started on the isometric sketching grid. Do not show the hidden lines.





Problem 3 (15 points)

The front and top views of an object are shown below (**in 3rd angle projection**). Create a partial auxiliary view that shows the true shape of the oblique surface **using 3rd angle projection**. You do not need to draw the entire object in the auxiliary views. The auxiliary views must be in their correct location, orientation and scale for an engineering drawing **in 3rd angle projection**. You do not need to add dimensions. Some reasonable degree of drawing accuracy is expected. You do not need to show hidden lines. Do not erase your (lightweight) construction lines.

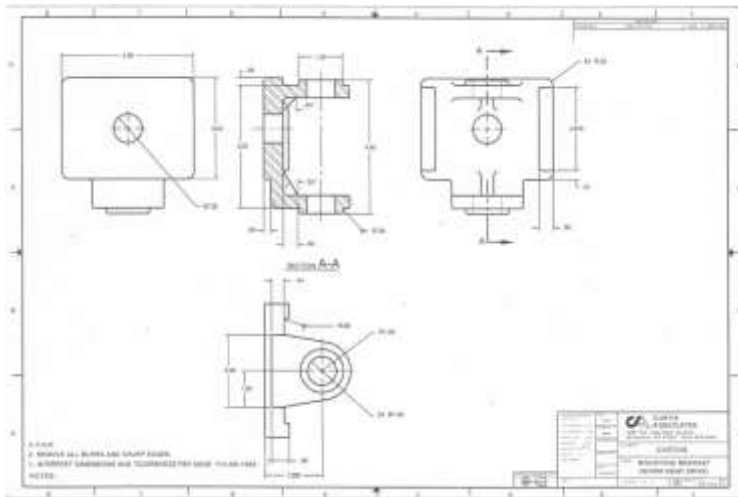


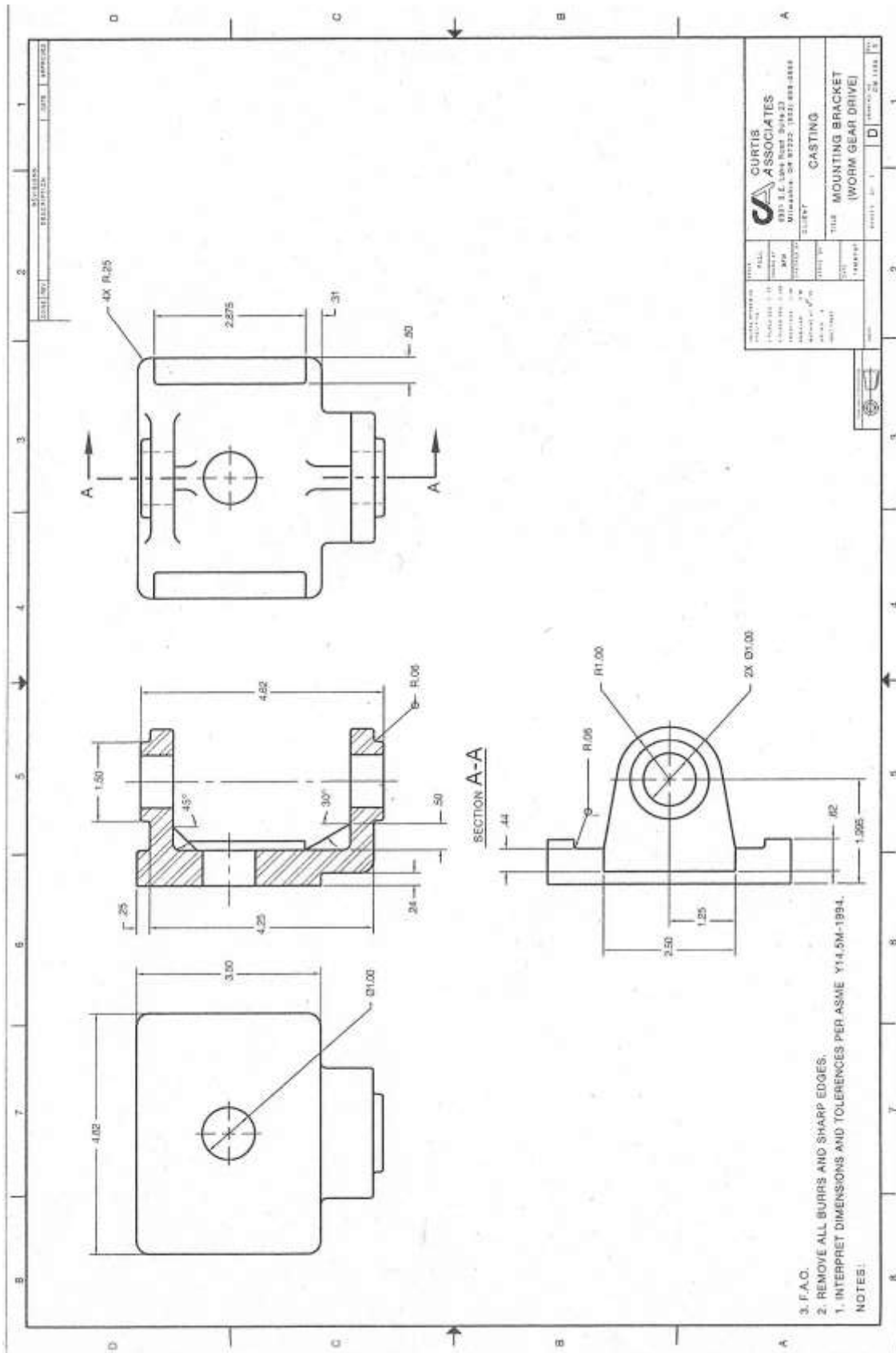
Problem 4 (20 points)

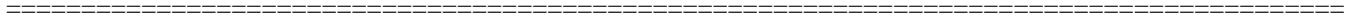
The figure below shows the front and top (in section), left and right side views of an object (in third angle projection).

- a) Sketch an isometric pictorial that shows the front, top and right side view of the object in its whole (un-cut) state. You do not need to include hidden lines, dimensions, or shading in the pictorial. .
- b) Sketch an isometric pictorial that shows the front, top, and revealed right side view after the object has been hypothetically cut at the cutting plane shown. Use crosshatching to identify the surfaces that have been cut. You do not need to include hidden lines, dimensions, or shading in the pictorial.

Preview image. An enlarged image of the drawing is shown on the next page for your convenience.

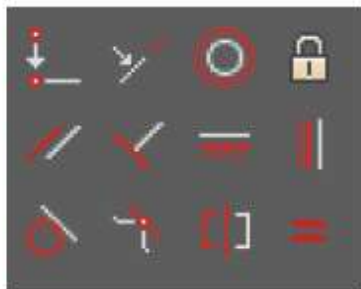
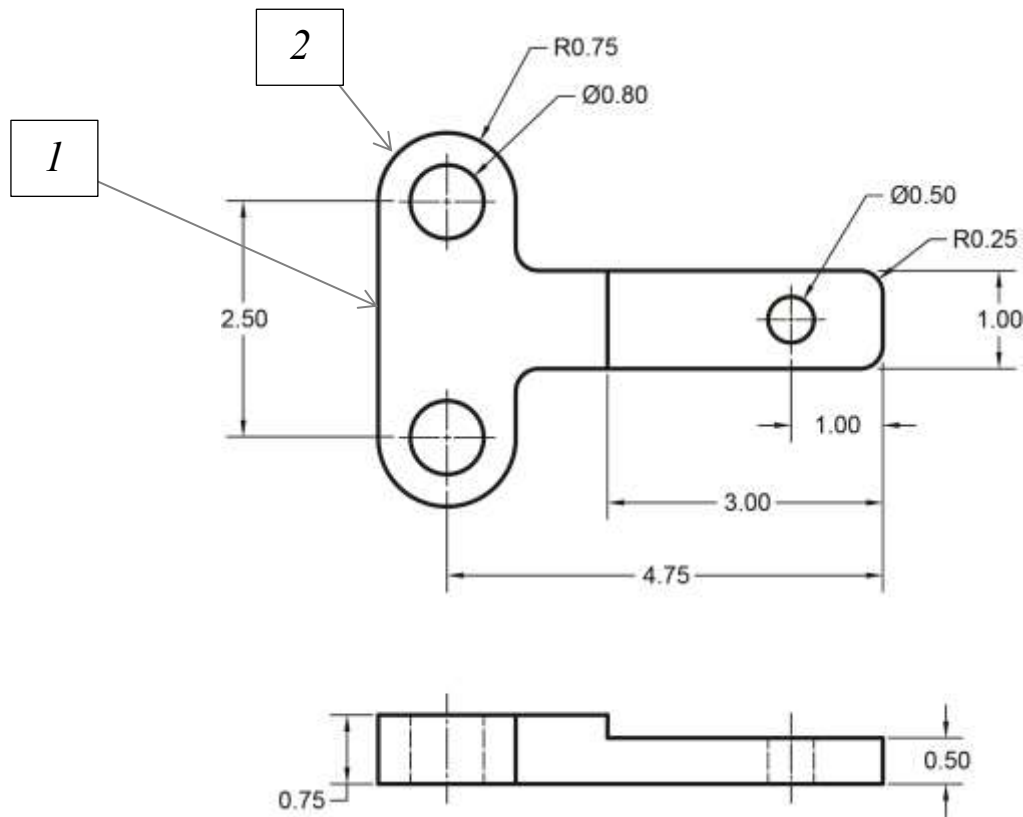






Problem 5 (20 points)

The front and top views of an object are shown below in third angle projection. When shown on a printed drawing, the dimensions shown are sufficient to fully define its geometry if the reader assumes that certain geometric constraints exist. It is desired to make the drawing fully parametric by adding the explicit geometric and associative (e.g. algebraic) constraints explicitly, so that changing any dimension will corresponding change the geometry in both views, including the hidden lines, center-marks and center-lines (created by the center line or center mark command). Tag each curve on the drawing with a number, and specify the geometric or associative constraint that must be added. This must be done for both the front and top views. Do not add additional dimensional constraints to the object geometry. The first two curves have been started (but may or may not be complete) as an example.



Coincident	Co-linear	Concentric	Locked
Parallel	Normal	Horizontal	Vertical
Tangent	Smooth	Symmetric	Equal

=====
Curve# Constraints

1. Vertical, endpoint coincident to 2, endpoint tangent to 2... (please complete...)

2. Endpoint coincident to 1, endpoint tangent to 1, ... (please complete...)

- 3.

- 4.

- 5.

- 6.

(continue adding curve numbers below until the drawing is complete)

,

.



=====

Problem 6 (10 points)

- a) Describe four advantages of using a 2-dimensional drawing program such as AutoCAD for making drawings instead of a 3-dimensional modeler such as Solidworks, Inventor, or Creo.
- b) When working with a 2-dimensional drawing program such as AutoCAD, describe three problems that may be encountered when editing a drawing that has been translated from a drawing made from a solid modeler such as Solidworks, Inventor, or Creo.