

Name \_\_\_\_\_

SID # \_\_\_\_\_

Engineering 28  
Spring Semester 2006  
Midterm Exam #1

60 minutes  
Closed Book Exam

Problem 1 \_\_\_\_\_ /20

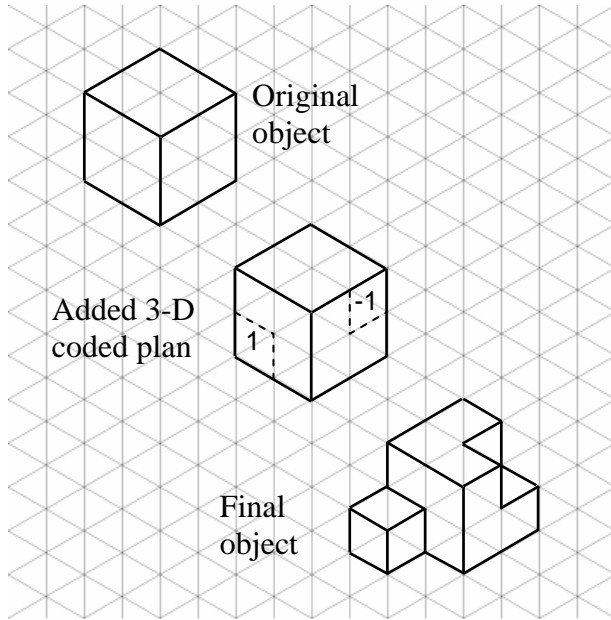
Problem 2 \_\_\_\_\_ /30

Problem 3 \_\_\_\_\_ /50

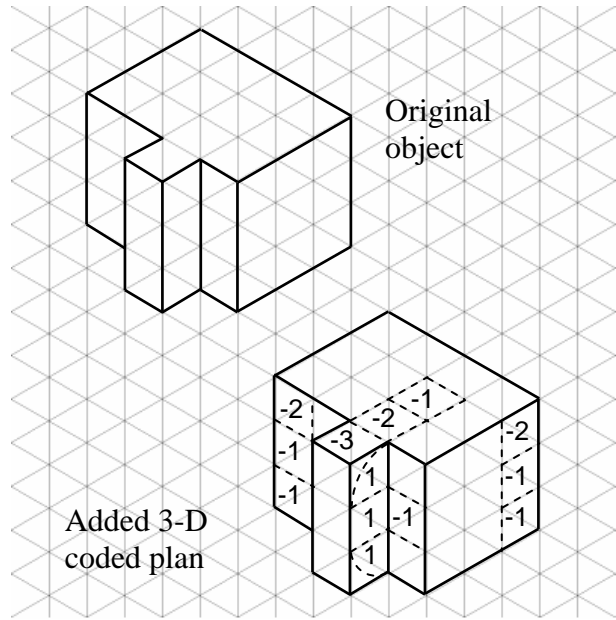
Total Score \_\_\_\_\_ /100

**Problem #1** 20 points

A 3-dimensional coded plan, such as the one shown below (on the left), uses dashed lines to outline the shape of material that is to be added or removed from any surface on the original object. Positive numbers indicate the length of extruded material to be added, and negative numbers indicate the depth of material to be removed.

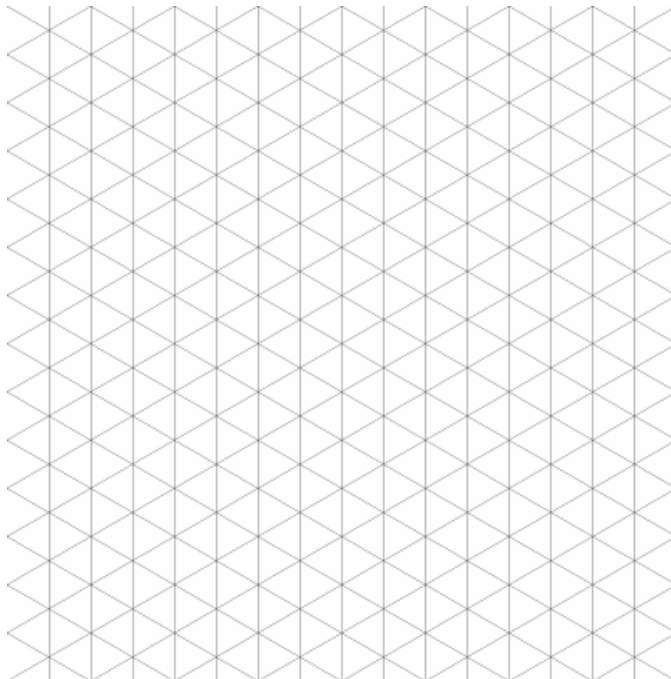


EXAMPLE



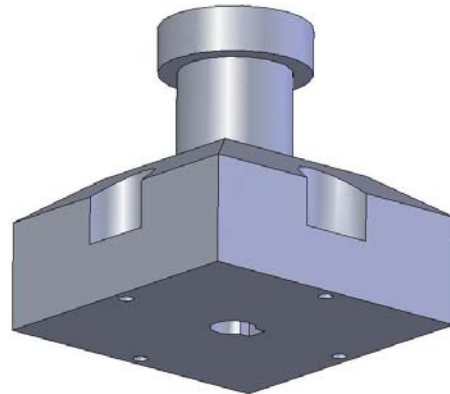
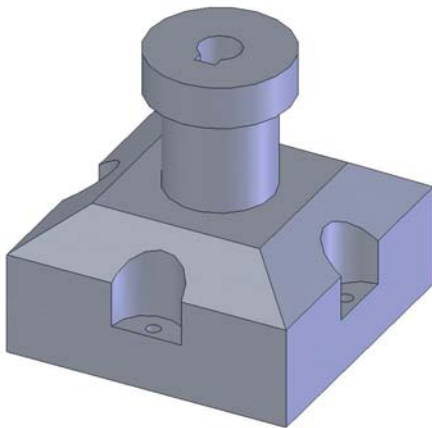
PROBLEM

Given the problem of the new object above on the right, and the 3-D coded plan superimposed on top of it, create an isometric sketch of the object with the indicated addition or removal of material.

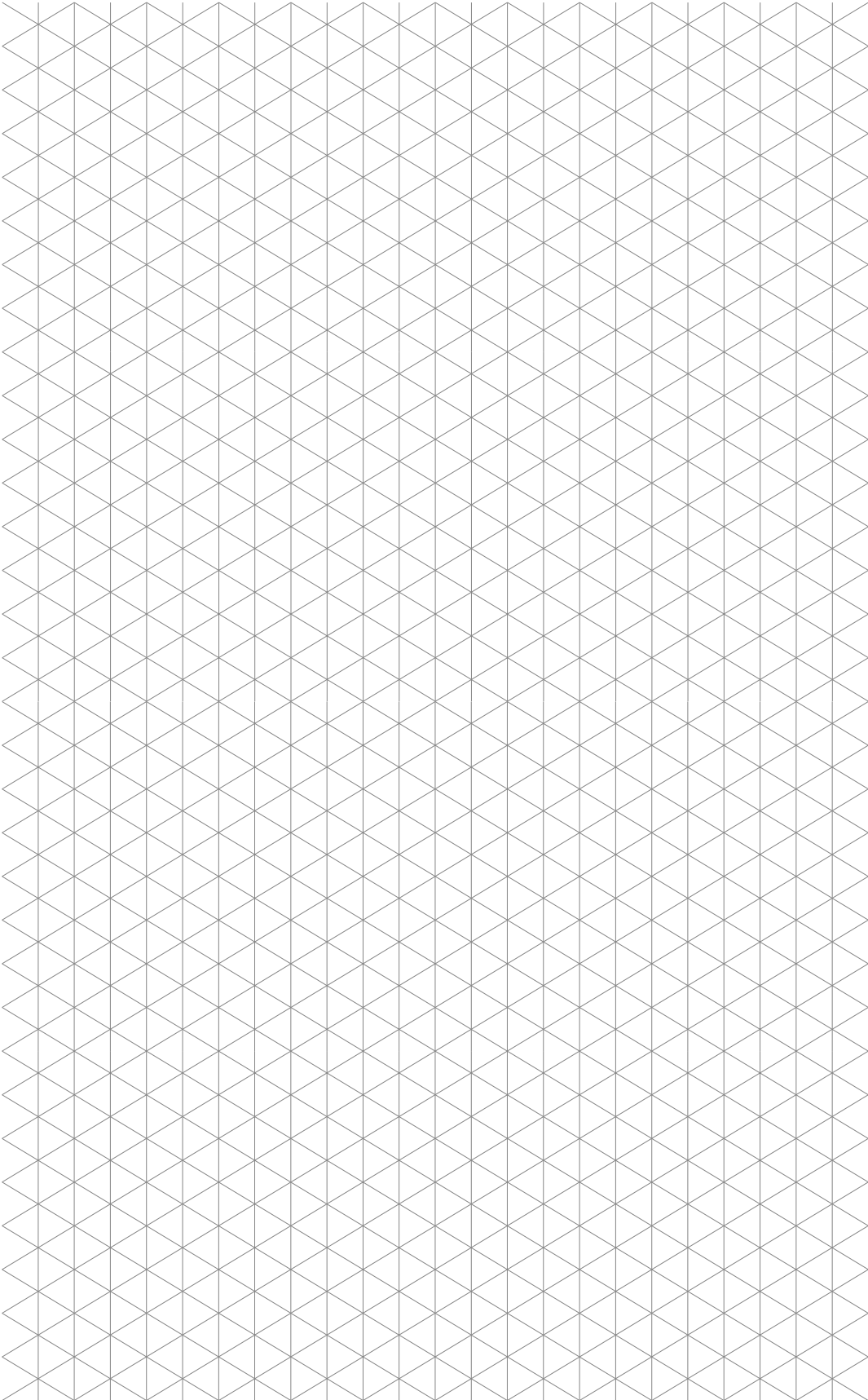


**Problem #2** 30 points

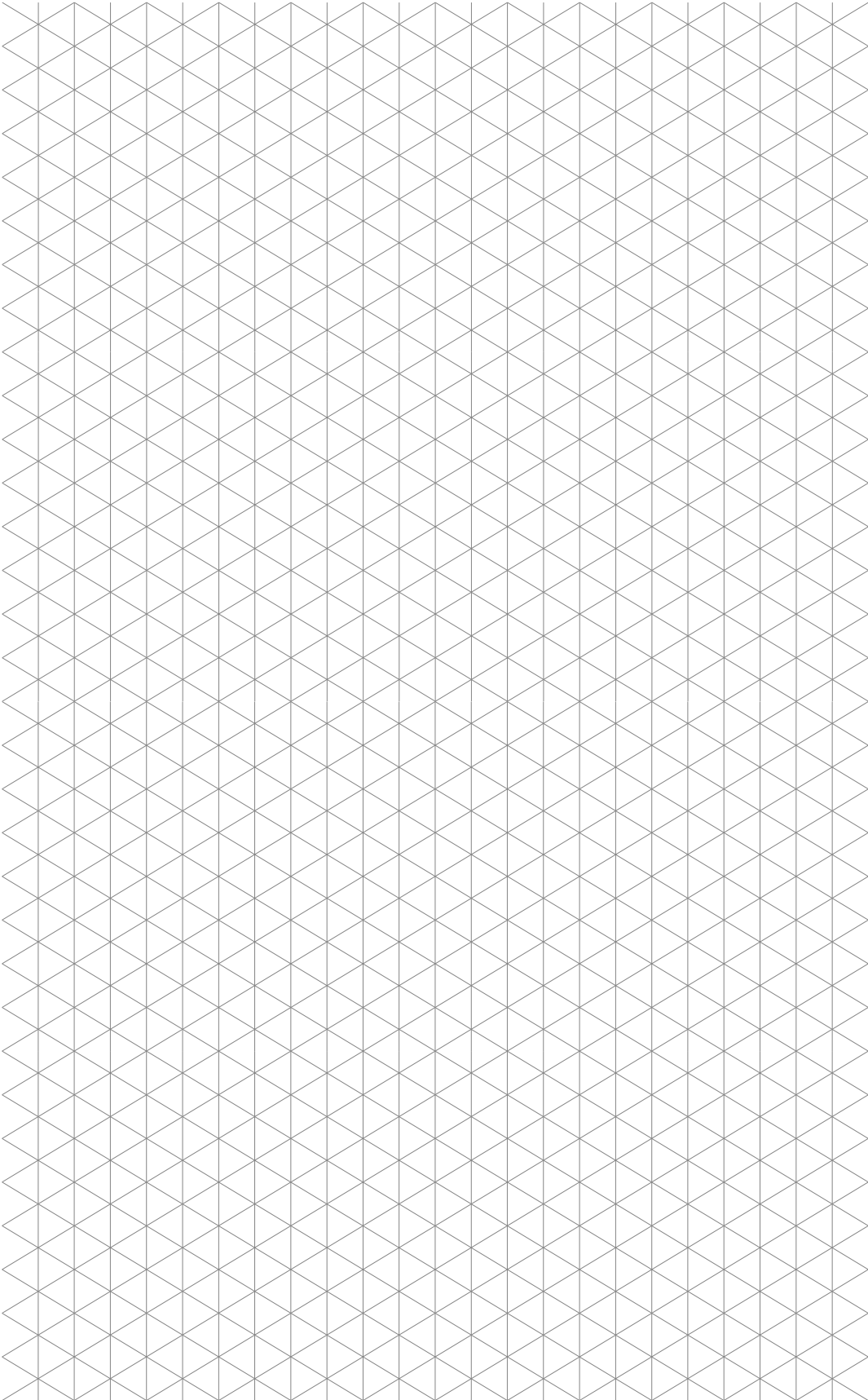
The object shown below (in two views) is approximately the size of a baseball, and is to be made of aluminum. Note that the object is symmetrical, there is a keyway in the center bore, and that the bore and the 4 holes go all the way through the object. Specify practical fabrication steps that can be used to create a prototype of the object by sketching pictorial diagrams of the part after each feature is created. Start with a standard stock material geometry. Specify the best prototype fabrication process that can be used to create each feature. For each process, sketch the shape and orientation of the cutting tool to be used. Use arrows (with a single arrowhead for relatively slow speed, and a double arrowhead for relatively fast speed) to show the motion of the tool and the work-piece during the cutting process.



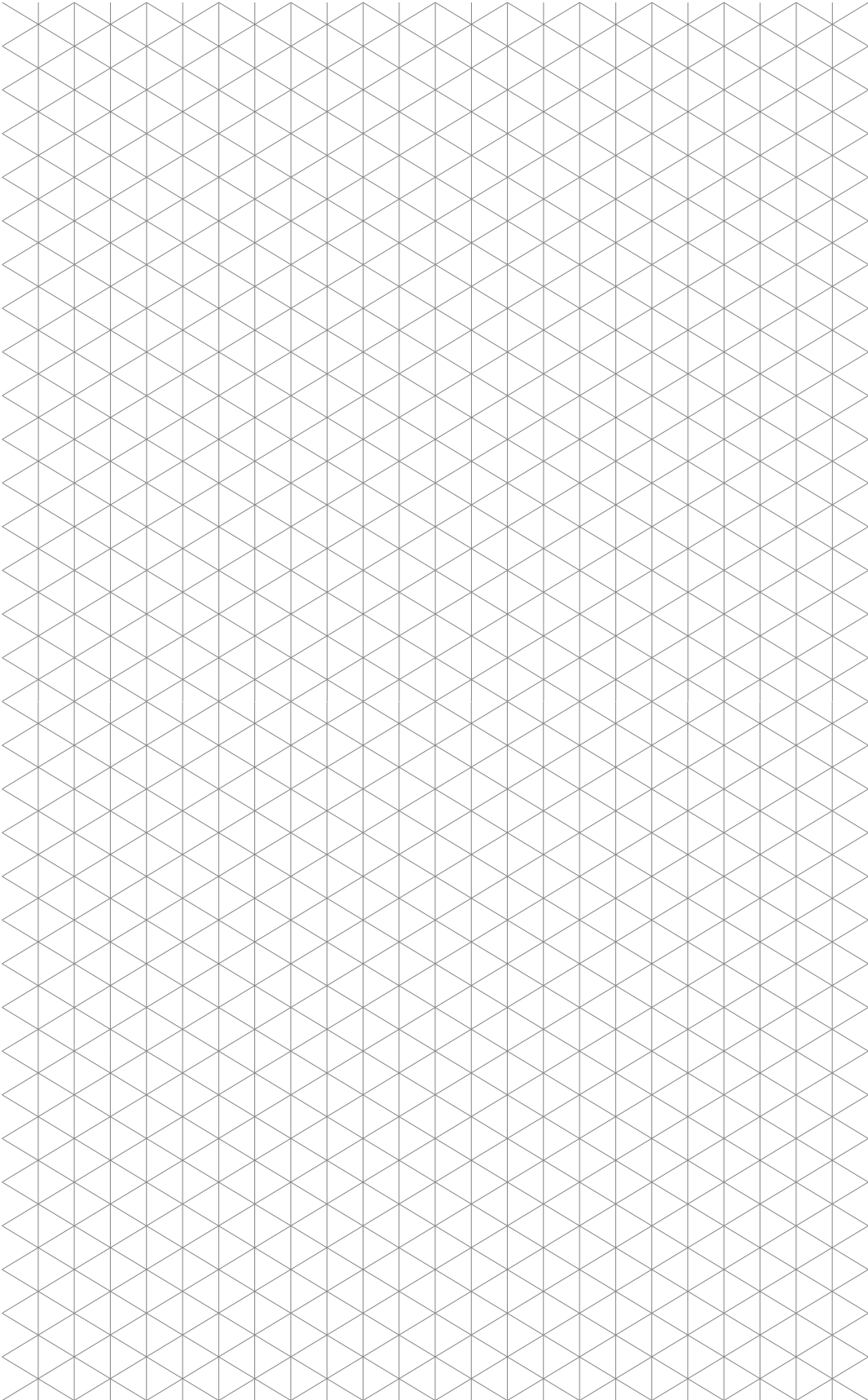
E28 Midterm Exam #1, Spring Semester 2006



E28 Midterm Exam #1, Spring Semester 2006

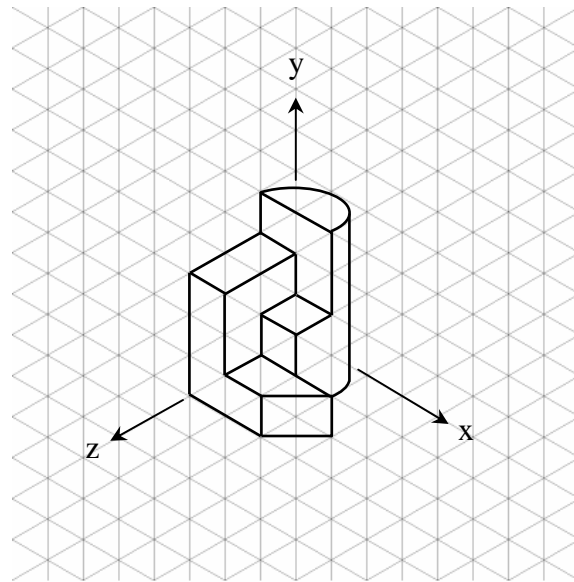
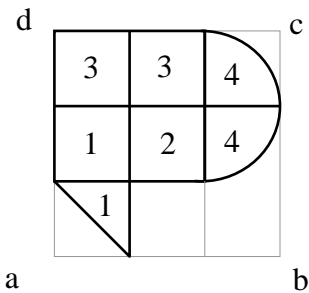


E28 Midterm Exam #1, Spring Semester 2006



**Problem #3** 50 points

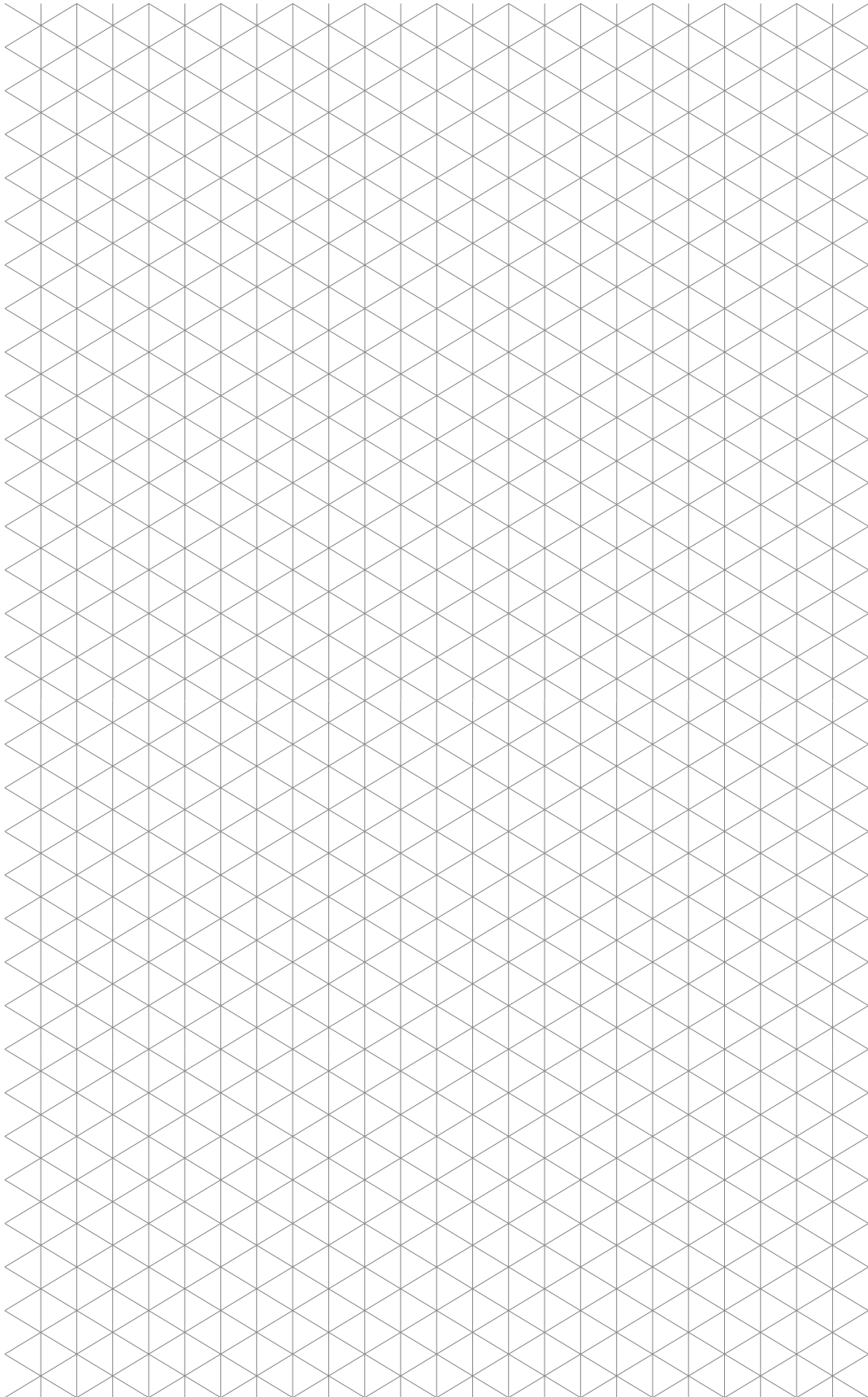
Consider the coded plan shown below. A bird's eye view isometric sketch of the object as seen from corner "a" is also shown.



- Create a bird's eye view isometric sketch of the 3-dimensional object created from the coded plan as seen from corner "b".
- Create a bird's eye view isometric sketch of the 3-dimensional object created from the coded plan as seen from corner "d".
- Starting with the bird's eye view isometric sketch of the 3-dimensional object created from the coded plan as seen from corner "a", and with the coordinate axes shown, sketch what the object would look like after the following rotation:
- Starting with the bird's eye view isometric sketch of the 3-dimensional object created from the coded plan as seen from corner "a", and with the coordinate axes shown, sketch what the object would look like after the following rotations:
- Create a worm's eye view isometric sketch from the coded plan as seen from corner "a".

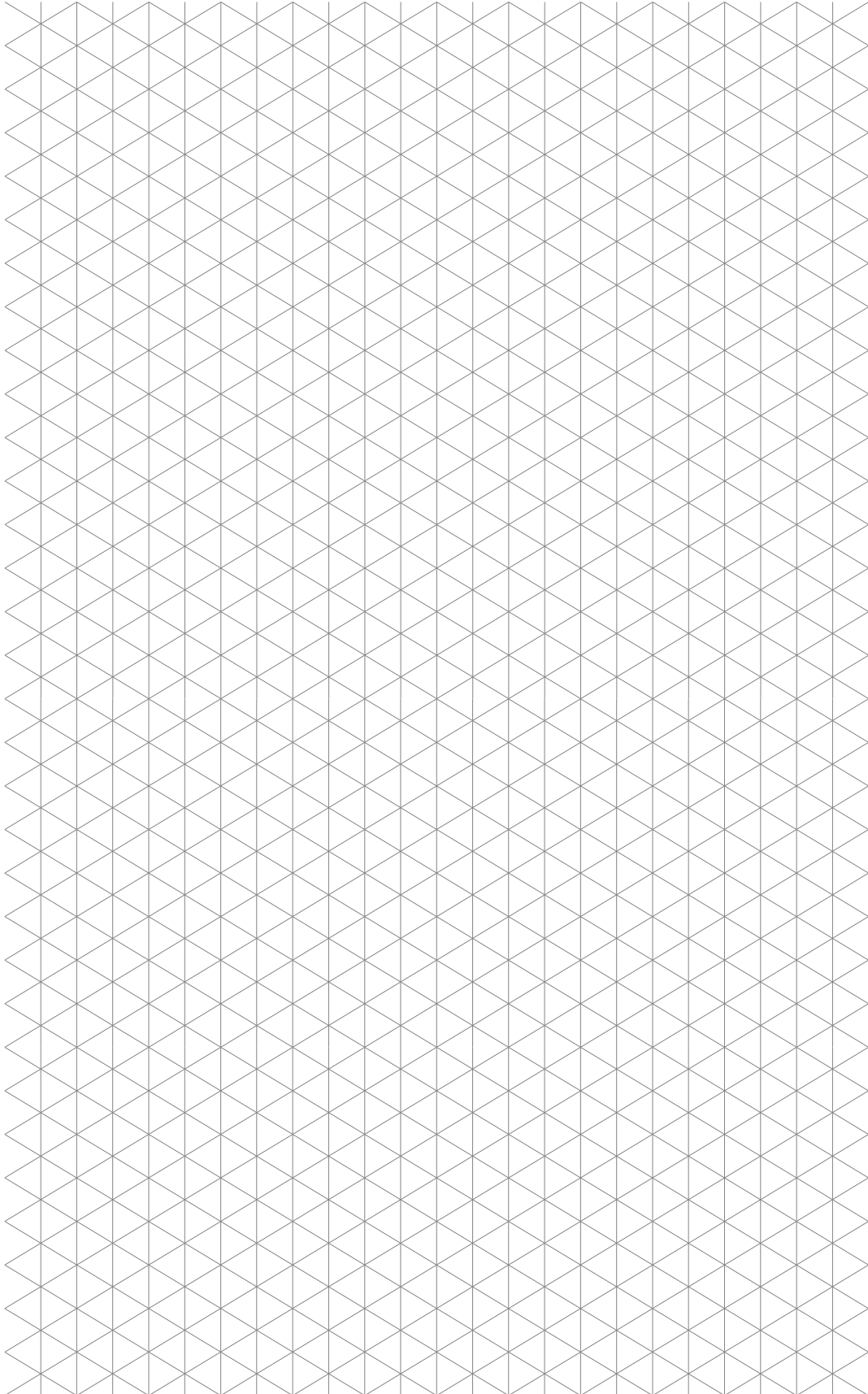
Do not show tangent edges in the sketches.

E28 Midterm Exam #1, Spring Semester 2006





E28 Midterm Exam #1, Spring Semester 2006



E28 Midterm Exam #1, Spring Semester 2006

