Exam #2 Review

Date of Exam: Thursday, November 10

1. This exam addresses the books *Stretching and Shrinking* and *Filling and Wrapping*. You should review all of the material in these books, including the Mathematical Reflections at the end of each chapter.

2. Look over your course notes and the "Summary of Class" posted on the course website. Be able to solve and discuss all of the material we did in class.

3. Look over all of the homework. Be able to solve and discuss all of these problems.

4. Look over all of the ACE problems, even those I did not assign.

5. Understand the concepts of scaling and similar figures. Be able to explain what it means for two figures to be similar, and how to determine a scale factor from one figure to the other.

6. Be able to identify and construct various similar figures, such as squares, rectangles, other quadrilaterals, triangles, polygons, circles, etc.

7. Be able to solve real world problems using principles of similarity.

8. Be able to work with transformations of the form $(x, y) \longrightarrow (ax+b, cy+d)$ to determine when these map figures to similar figures, and to determine the scale factor.

9. Be able to explain and determine the relationship between scale factor, angle measure, length, perimeter, area, surface area, and volume.

10. I will provide various volume and surface area formulas. Be able to justify the following formulas: volume of prism, volume of cylinder, surface area of prism, surface area of cylinder, surface area of pyramid with regular base and centered apex, surface area of cone. Be able to explain how to make one specific example of a pyramid whose volume is $\frac{1}{3}Bh$. Be able to state Cavalieri's Principle and use it to justify the volume of a hemisphere. Be able to use "skinny pyramids" to motivate the relationship $V = \frac{1}{3}Sr$ for spheres and then use it to get the surface area formula from the volume formula.