MA241
Exam #3 Review

You should be able to:

1. Recognize whether or not two given sets are congruent or similar.
2. Give the definition, via functions, for two sets to be congruent or similar.
3. Understand the results of applying a function of the form $f : (x, y) \to (ax + b, cx + d)$ to a set in the plane.
4. Given a function mapping the plane to itself, determine the image of a given set under action of the function.
5. Given two similar sets in the plane, find at least one one-to-one onto function from one set onto the other that exhibits the required scaling factor.
6. Given a function mapping one region onto another, determine whether or not that the ratios of corresponding line segments are equal.
7. Prove that any two circles are congruent.
8. Explain how the notion of congruence can be used to define the notion of symmetry of a set.
9. Derive the formulas for the surface areas of rectangular boxes, cylinders, cones, and pyramids.
10. Demonstrate how the formulas for areas of various regions or surface area and volume for various solids exhibit show by what factors these areas and volumes change under scaling of the object.
11. Give the definition of reptile and predict how many copies of smaller reptiles are necessary to comprise a larger one with a given scaling factor.
12. Prove or disprove: Every triangle is a reptile.
13. Use the scale of a map to determine the distance between two locations on the map.
14. Given two similar sets, determine missing measurements from given measurements, and be familiar with some applications to physical measurements.
15. Explain how to use a mirror to estimate the height of an object.
16. Explain how to use shadows to estimate the height of an object.