MAT 150, Introduction to Advanced Mathematics Name _____

Homework 11, due by 12/8

Score_____

1. Find the composition of two rotations: the rotation in the counterclockwise direction about a point A by angle 120° followed by the rotation in the counterclockwise direction about a point B by angle 120°: prove that this is a rotation, find the center and angle of this rotation.

2. Construct a triangle with sides a and b and altitude h_a (dropped to the side a) congruent to given segments. Prove that the construction gives a triangle with the required properties. How does the number of solutions considered up to congruence depend on the data?

3. Can a quadrilateral have two parallel axes of symmetry? Give a detailed answer with a proof.

4. A plane geometric figure (say, a polygon) has two axes of symmetry forming an angle 60°. Does it have other axes of symmetry? What can be the total number of them?

5. How many axes of symmetry does a cube have? Show them on a picture.