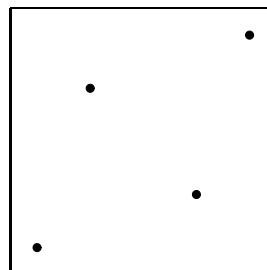
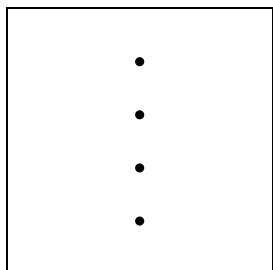


**EXAM 2**  
Math 152  
November 9, 2009

Name \_\_\_\_\_

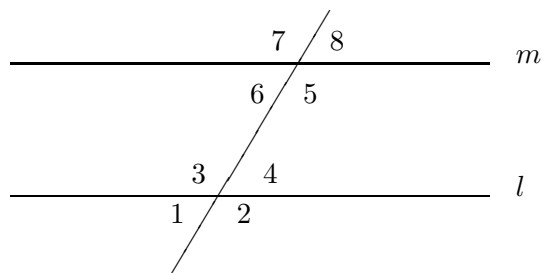
You must show all your work. Partial credit will be given.

1. Find all possible symmetries for the two figures below. (both line and rotation, if they exist.)

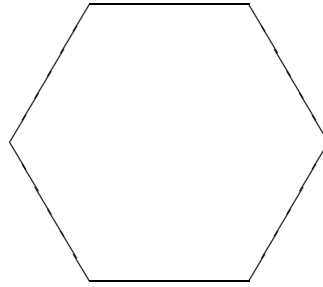
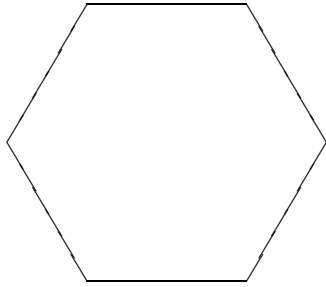


2. Consider the analytic definition of a Rhombus and the analytic definition of a Parallelogram. Sketch a picture of a parallelogram. Is your picture a Rhombus? Could you draw a Parallelogram which is a Rhombus? If so, draw one, if not explain.

3. Assume that lines  $l$  and  $m$  are parallel. What is  $m(\angle 5)$ , if the  $m(\angle 3) = 115^\circ$ ? What is the  $m(\angle 2)$ ?



4. Below are two Hexagons. In one of them draw line segments that divide the hexagon into three identical parts where each part is a Rhombus. In the other draw line segments that divide the hexagon into six identical parts where each part is a Kite.

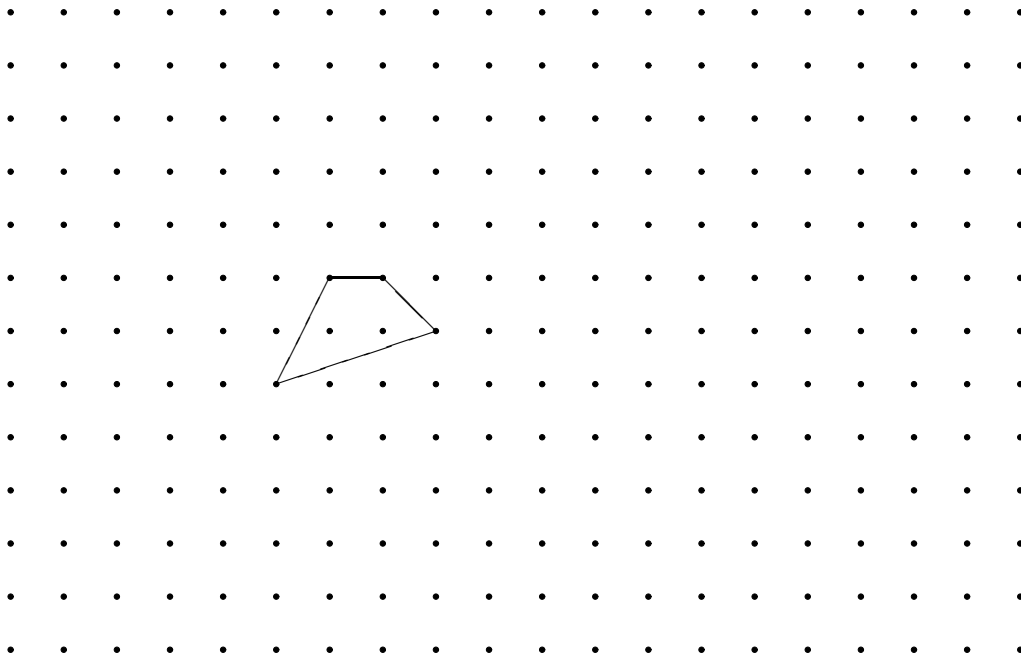


5. Sketch an isosceles trapezoid and show all of its symmetries (both line and rotational).

6. For each of the following geometric types some of the vertex angles are listed. Find the other vertex angle.

- (a) Triangle: one angle measures  $35^\circ$  another angle measures  $50^\circ$ , what does the third angle measure?
- (b) Kite (Not a rhombus): Two opposite angles measure  $115^\circ$ , what do the other angles measure?
- (c) Octagon: Angles of measure  $145^\circ$ ,  $125^\circ$ ,  $115^\circ$ ,  $135^\circ$ ,  $165^\circ$ ,  $155^\circ$ ,  $110^\circ$  exist, what is the measure of the  $8^{th}$  angle?

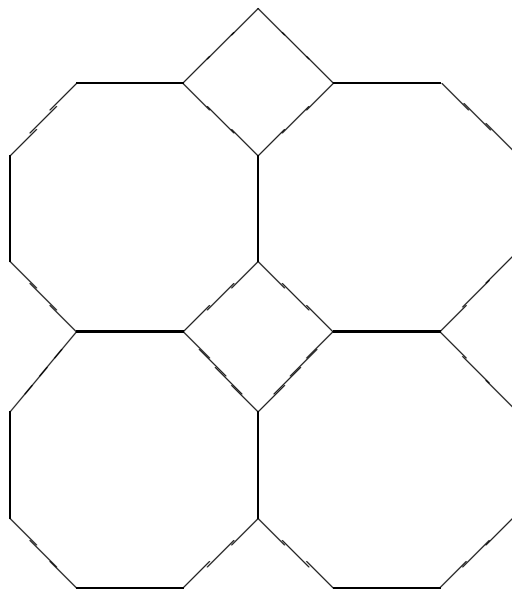
7. On the grid below is a quadrilateral. Show a tessellation of the grid using the quadrilateral. (You don't need to completely fill up the grid, just show me the pattern)



Now draw the vertex figure for this tessellation.

8. What is the measure of the central angle of a regular 12-gon? vertex angle? exterior angle?

9. Find the vertex arrangement for the tessellation shown below. Now draw a vertex figure at one vertex.



10. Suppose we know that the  $m(\angle 6) = 61^\circ$  and  $m(\angle 2) = 119^\circ$ . Are the lines  $l$  and  $m$  parallel or not parallel?

