7th grade   Task 3   Pattern

Student Task	Determine symmetrical properties of shape. Calculate lengths and angles in symmetrical figures.
Core Idea 3 Geometry and Measurement	**Apply congruence and similarity to analyze mathematical situations. Apply appropriate techniques, tools, and formulas to determine measurements.** • Understand relationships among the angles, side lengths, perimeters, and the areas of similar objects • Develop and critique inductive and deductive arguments concerning geometric ideas and relationships. • Understand line of symmetry. (6th grade) • Investigate and reason about the results of subdividing, combining, and transforming shapes. (6th grade)

Seventh Grade – 2003
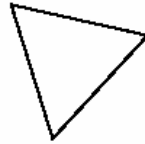
Pattern

This problem gives you the chance to:
• use symmetry properties of shapes
• calculate lengths and angles in symmetric figures

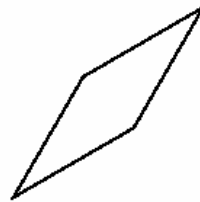The questions below are about equilateral triangles and rhombuses.

1. What is the measure of each of the angles of an equilateral triangle?
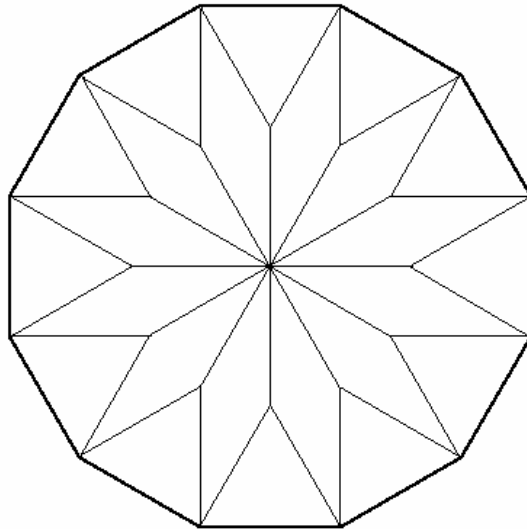
_____ degrees

2. Draw all the lines of symmetry of this triangle.

3. Draw all the lines of symmetry of this rhombus.

Twelve congruent equilateral triangles and twelve congruent rhombuses are put together to make this design.

4. How many lines of symmetry does the design have?   _____

Pattern   Test 7: Form A

Seventh Grade – 2003

5. The length of each side of the equilateral triangles and the rhombuses is 2.3 centimeters.

Calculate the perimeter of the design. _____ centimeters
Show how you figured it out.

6. Look at the center of the diagram, where an acute angle of each
of the 12 rhombuses meet.

What is the measure of each of the angles? _____ degrees

The diagram below shows an enlargement of part of the design shown on page 4. The circle
shows where the vertices of two of the rhombuses and one of the equilateral triangles meet.
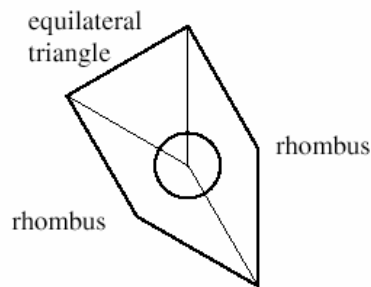
7. On the diagram above, write the measure of the angle of the equilateral triangle that is in
the circle. Use the diagram to calculate the measure of the rhombus angles that meet in the
circle.

_____ degrees

Show how you figured it out.

9

Pattern   Test 7: Form A

Seventh Grade – 2003

The core elements of performance required by this task are:
- use symmetry properties of shapes
- calculate lengths and angles in symmetric figures

Based on these, credit for specific aspects of performance should be assigned as follows:

	Points	Section Points
1. Gives correct answer as: **60** degrees	1	1
2. Draws three correct lines of symmetry on the triangle.	1	1
3. Draws two correct lines of symmetry on the rhombus.	1	1
4. Gives correct answer as: **12**	1	1
5. Gives correct answer as: **27.6** centimeters Shows 12×2.3	1 1	2
6. Gives correct answer as: **30°**	1	1
7. Gives correct answer and shows calculation as: Angle $= (360° - 60°) \div 2 = 300° \div 2 = \mathbf{150°}$	2	2
Total Points		**9**

Seventh Grade – 2003