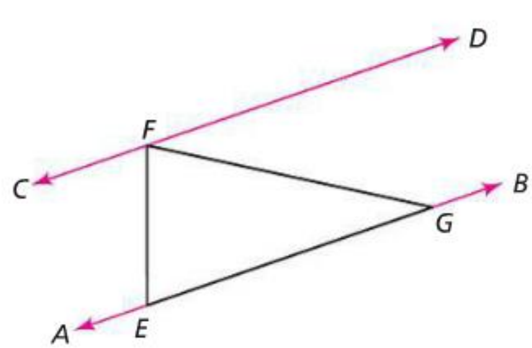
Homework Investigation 1D **Name:**

1.11

On Your Own

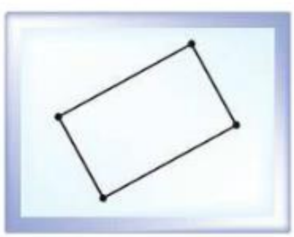
8. Tennis balls are sold in cans of three stacked balls. Which is greater—the height of the can or the circumference of the can?

9. In the figure below, $\overleftrightarrow{CD} \parallel \overleftrightarrow{AB}$. How can you construct a right triangle that has the same area as $\triangle EFG$?

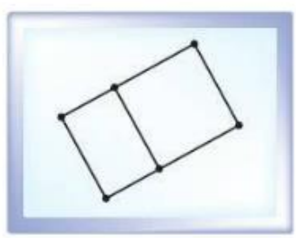


10. **Take It Further**

a. Use geometry software to construct a rectangle. Then divide the rectangle into a square and a smaller rectangle.



a rectangle



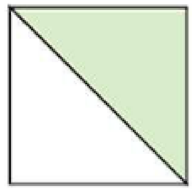
the rectangle divided into a square and a smaller rectangle

Find the length-to-width ratio in each nonsquare rectangle. Are the two ratios equal?

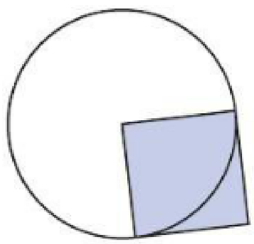
Homework Investigation 1D **Name:**

11. Decide whether each ratio in parts (a)–(c) is constant, even if you stretch the given figure with the given restrictions. Justify each answer.

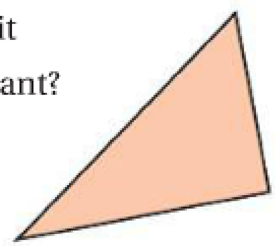
a. The square remains square. Is the ratio $\frac{\text{area of triangle}}{\text{area of square}}$ invariant? If so, what is the ratio?



b. The circle remains a circle. The square remains a square. Is the ratio $\frac{\text{area of circle}}{\text{area of square}}$ invariant? If so, what is the ratio?



c. The triangle remains a triangle. You can reshape it in any way. Is the ratio $\frac{\text{perimeter of triangle}}{\text{area of triangle}}$ invariant? If so, what is the ratio?



12. Standardized Test Prep Maya constructed a regular hexagon inside a circle. The hexagon consists of six equilateral triangles. To compute the sum of the measures of the angles of the regular hexagon, she found the sum of the measures of the angles of the six triangles. From that sum, she subtracted the measure of each angle with a vertex at the center of the circle.

What is the sum of the measures of the angles of Maya's regular hexagon?

A. 360° **B.** 540° **C.** 720° **D.** 1080°

Homework Investigation 1D **Name:**

1.12

On Your Own

7. Construct several different triangles. Then construct their medians. Describe any concurrence or collinearity you find.

8. **Standardized Test Prep** Triangle ABC is an isosceles triangle. $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ are altitudes. $\overline{AD}$, $\overline{BG}$, and $\overline{CH}$ are angle bisectors. Points D, I, and J are the midpoints of $\overline{BC}$, $\overline{AC}$, and $\overline{AB}$, respectively.

Which of the following statements may NOT be true?

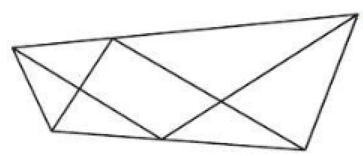
A. The concurrences of the altitudes, angle bisectors, and medians are collinear.

B. $\overline{CI} \cong \overline{CD}$

C. $\overline{AD}$ is a median.

D. $\angle BCH \cong \angle HCA$

9. Use a piece of paper or geometry software to build an arbitrary quadrilateral. On one side, place an arbitrary point. Connect the point to the two opposite vertices of the quadrilateral. Do the same on the opposite side.



For help constructing an irregular polygon, see the TI-Nspire Handbook, p. 712.

Finally, draw the diagonals of the quadrilateral. Find two obvious collinearities. Find one surprising collinearity.

10. **Take It Further** Consider this statement: In any hexagon, there can be at most one concurrence of three diagonals. Is this statement true or false? Explain your reasoning.