

# Looking Back and Looking Ahead

## Unit Review

While working on problems in this unit, you extended your skill in using a coordinate system to locate points and figures. Then, by studying patterns in the side lengths and areas of squares on dot grids, you learned the Pythagorean Theorem. You used this property of right triangles to solve a variety of practical problems, some of which involved irrational numbers.

Go  online  
PHSchool.com

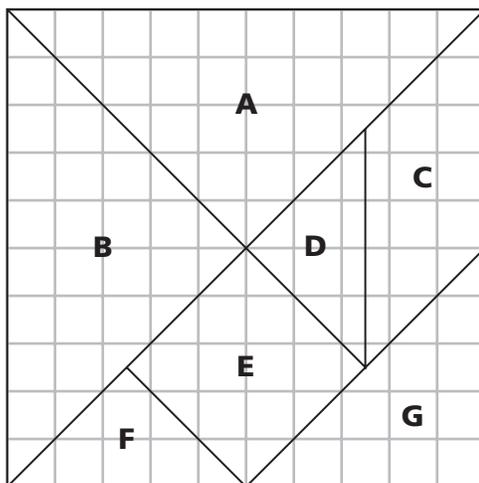
For: Vocabulary Review  
Puzzle

Web Code: apj-2051

## Use Your Understanding: The Pythagorean Theorem

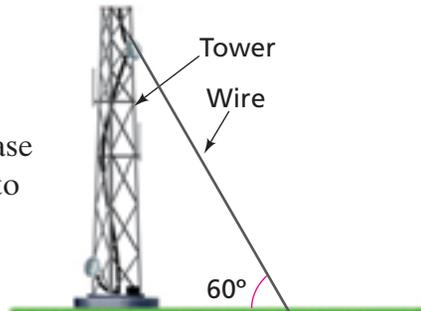
Test your understanding of the Pythagorean Theorem and its relationship to area, lengths of line segments, and irrational numbers by solving the following problems.

1. The diagram shows a Chinese tangram puzzle on a 10-by-10 grid.



- a. What is the area of shape E?
- b. What is the length of each side of shape E?
- c. What are the lengths of the sides of triangle A?
- d. Name all the triangles that are similar to triangle A. In each case, give a scale factor for the similarity relationship.

2. A 60-foot piece of wire is strung between the top of a tower and the ground, making a 30-60-90 triangle.
  - a. How far from the center of the base of the tower is the wire attached to the ground?
  - b. How high is the tower?



## Explain Your Reasoning

When you present work based on the Pythagorean relationship, you should be able to justify your calculations and conclusions.

3. How can you find the side length of a square if you know its area?
4. How can you find the length of a segment joining two points on a coordinate grid?
5. The diagrams below show squares drawn on the sides of triangles.

Figure 1

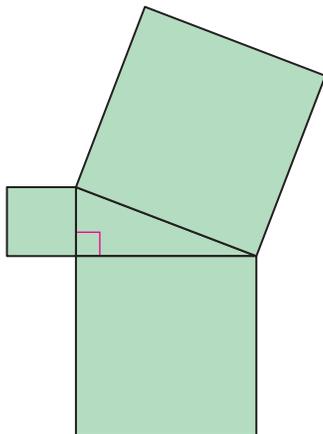
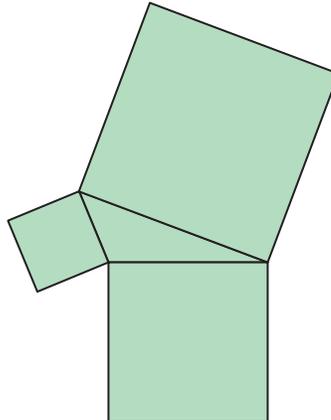


Figure 2



- a. In Figure 1, what is the relationship among the areas of the squares?
- b. Explain why the relationship you describe in part (a) is not true for Figure 2.

6. Explain with words and symbols how to use the Pythagorean Theorem to find the
- a. length of a diagonal of a square with side length  $s$ .
  - b. length of a diagonal of a rectangle with side lengths  $s$  and  $t$ .
  - c. length of the hypotenuse of a right triangle with legs of lengths  $s$  and  $t$ .
  - d. height of an equilateral triangle with side length  $s$ .
  - e. length of one leg of a triangle when the lengths of the hypotenuse and the other leg are  $h$  and  $t$ , respectively.

### Look Ahead

You will use the properties of right triangles you discovered in this unit, including the Pythagorean Theorem, in many future *Connected Mathematics* units, and in the math, science, and technology courses you take in high school and college.