

▶ ACTIVITY 9.4

Developing Concepts

GROUP ACTIVITY

Work in a group of three students.

MATERIALS

- paper
- pencil
- ruler
- compass

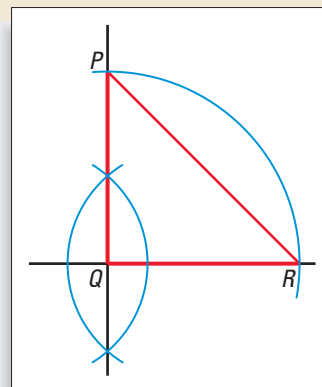
Investigating Special Right Triangles

Group Activity for use with Lesson 9.4

► **QUESTION** A triangle with angle measures of 45° , 45° , and 90° , or 30° , 60° , and 90° is called a *special right triangle*. How are the side lengths of a 45° - 45° - 90° triangle or a 30° - 60° - 90° triangle related?

► EXPLORING THE CONCEPT: 45° - 45° - 90° TRIANGLE

1. Construct an isosceles right triangle. The length of a leg of the triangle should be 3, 4, or 5 centimeters. Each person in your group should choose a different length.
2. Use the Pythagorean Theorem to find the length of the hypotenuse. Write the length in simplest radical form.

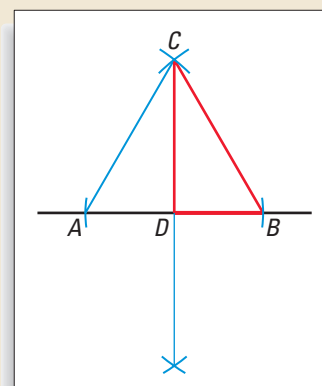


► CONJECTURE

3. Compare your results with those of the other students in your group. What pattern do you observe? Make a conjecture about the relationships among the side lengths of an isosceles right triangle.

► EXPLORING THE CONCEPT: 30° - 60° - 90° TRIANGLE

4. Construct an equilateral triangle with side lengths of 4, 6, or 8 centimeters. Each person in your group should choose a different length.
5. Next construct the altitude from one of the vertices. The equilateral triangle is now divided into two congruent right triangles whose angle measures are 30° - 60° - 90° .
6. Find the side lengths of one of the right triangles. Write each length in simplest radical form.



► CONJECTURE

7. Find each of the following ratios:
 - the length of the hypotenuse to the length of the shorter leg
 - the length of the longer leg to the length of the shorter leg

Compare your ratios with those of the other students in your group. What patterns do you observe? Make a conjecture about the ratios of the side lengths of a 30° - 60° - 90° triangle.