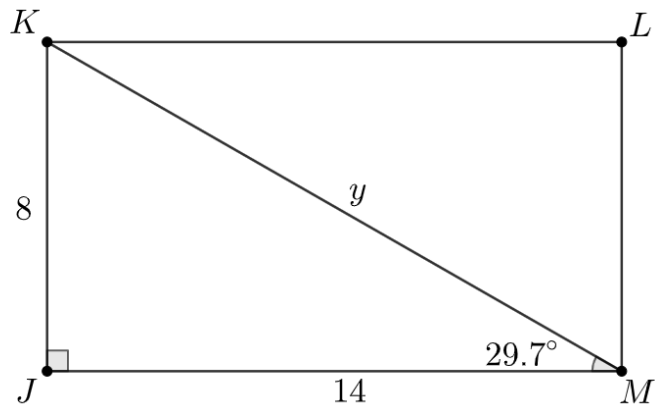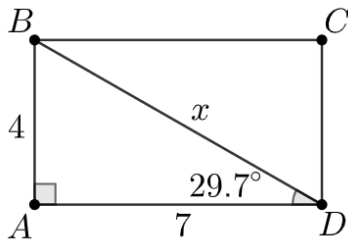# Lesson 4.02
Half a Square

Geometry GT

Recall

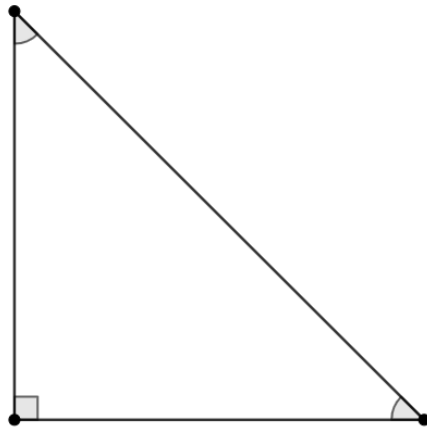Calculate the values of x and y.

Explore

Draw a square with side lengths of 1cm. Estimate the length of the diagonal. Then calculate the length of the diagonal.

Measure the side length and diagonal length of several squares, in millimeters. Compute the ratio of side to diagonal length for each.
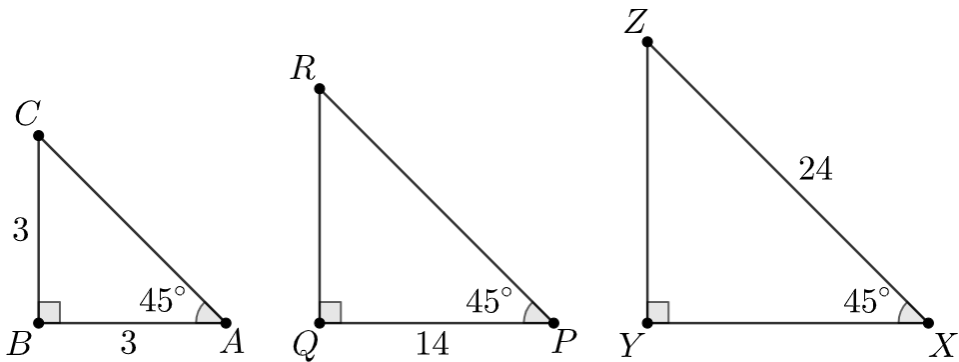
Make a conjecture.

Special Right Triangles

Discuss

Calculate the lengths of the 5 unlabeled sides.

Demonstrate

Simplify each radical by either finding the largest perfect square or writing the number as a product of primes.

$\sqrt{75}$ $\qquad\qquad\qquad\qquad\qquad\qquad$ $\sqrt{108}$

$\sqrt{80}$ $\qquad\qquad\qquad\qquad\qquad\qquad$ $\sqrt{30}$

Rationalize each denominator by multiplying the top and bottom by the radical in the denominator.
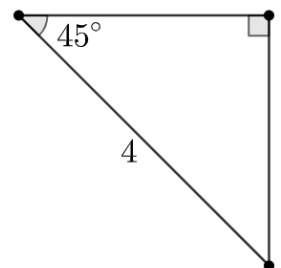
$\dfrac{3}{\sqrt{2}}$ $\qquad\qquad\qquad\qquad\qquad\qquad$ $\dfrac{9}{2\sqrt{2}}$

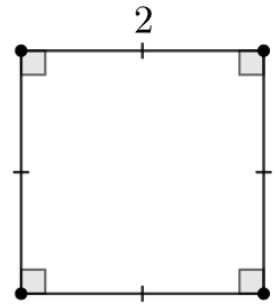$\dfrac{5}{\sqrt{5}}$ $\qquad\qquad\qquad\qquad\qquad\qquad$ $\dfrac{\sqrt{2}}{\sqrt{3}}$

Practice

1. Find the lengths of the legs. All radicals should be simplified, and any radicals must be in the numerator.

2. Find the length of the diagonal?

3. A square has a diagonal of length 5cm. What is the area of the square?

4. Skye is teaching her younger cousin to ride a bike. She wants to stay on roads that are not too steep and easy enough for a new bike rider. She has decided the roads must have an angle less than or equal to 7 degrees. A 7 degree angle in a right triangle has a 3:25 ratio for the legs. List the legs of **two** right triangles that would be safe for a new bike rider.