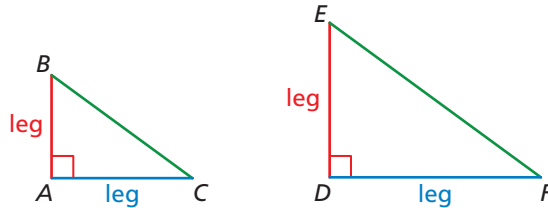# 2.2b Triangles and Slope

Key Idea

Identifying Similar Right Triangles

Words Two right triangles are similar if their corresponding leg lengths are proportional.
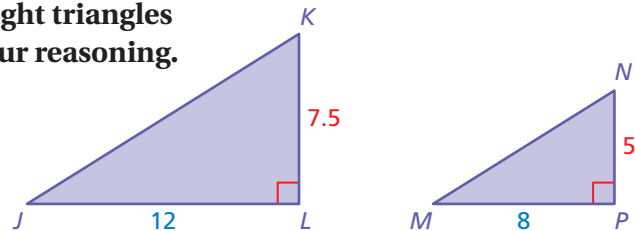
Triangle ABC is similar to triangle DEF: $\triangle ABC \sim \triangle DEF$

Symbols $\dfrac{AB}{DE} = \dfrac{AC}{DF}$

EXAMPLE 1 Identifying Similar Right Triangles

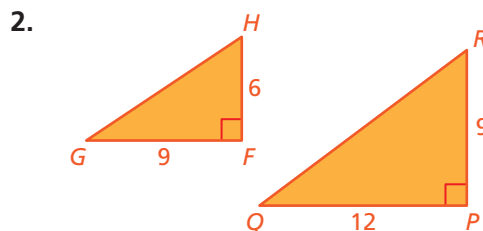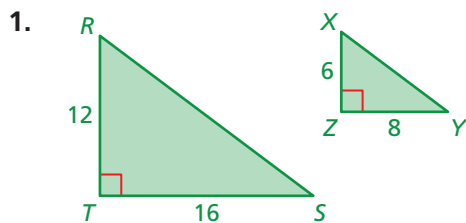**Tell whether the two right triangles are similar. Explain your reasoning.**

Check to see if corresponding leg lengths are proportional.

$$\frac{KL}{NP} = \frac{7.5}{5} = \frac{3}{2} \qquad \frac{JL}{MP} = \frac{12}{8} = \frac{3}{2}$$

Corresponding leg lengths are proportional. So, $\triangle JKL \sim \triangle MNP$.

Practice

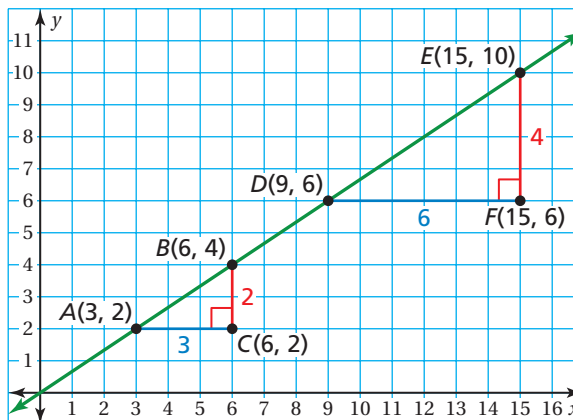**Tell whether the two right triangles are similar. Explain your reasoning.**

1.

2.

3. REASONING How does the ratio of the leg lengths of a right triangle compare to the ratio of the corresponding leg lengths of a similar right triangle? Explain.

EXAMPLE 2 **Using Similar Triangles to Find Slope**

The graph shows similar right triangles drawn using pairs of points on a line.

a. For each triangle, find the ratio of the length of the vertical leg to the length of the horizontal leg.

Triangle ABC

$$\frac{\text{vertical leg}}{\text{horizontal leg}} = \frac{BC}{AC} = \frac{2}{3}$$

Triangle DEF

$$\frac{\text{vertical leg}}{\text{horizontal leg}} = \frac{EF}{DF} = \frac{4}{6} = \frac{2}{3}$$

b. Relate the ratios in part (a) to the slope of the line.

The ratios in part (a) represent rise over run, or the slope of the line between points A and B, and between points D and E.

∴ So, the slope of the line is $\frac{2}{3}$.

Practice

4. **SLOPE** Consider the line shown in the graph.

a. Draw two triangles that show the rise and the run of the line using points A and B and points M and N.

b. Use the triangles to find the slope of the line.

c. Repeat parts (a) and (b) using different pairs of points.

5. **REASONING** You draw a triangle that shows the slope of a line using two points. Then you draw another triangle that shows the slope using a different pair of points on the same line. Are the triangles similar? Explain.

6. **WRITING** Explain why you can find the slope of a line using any two points on the line.