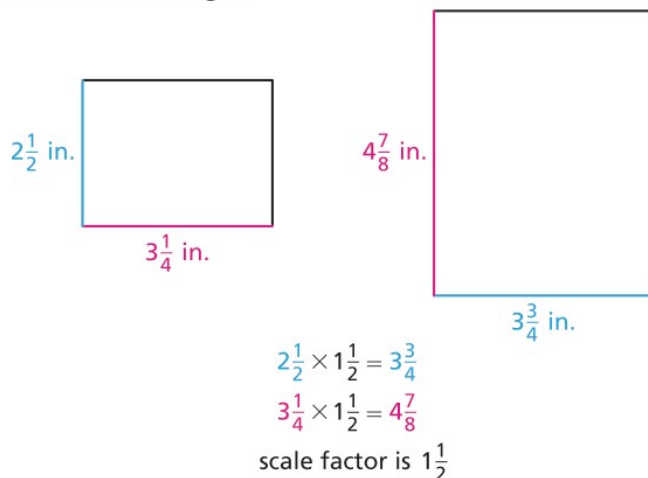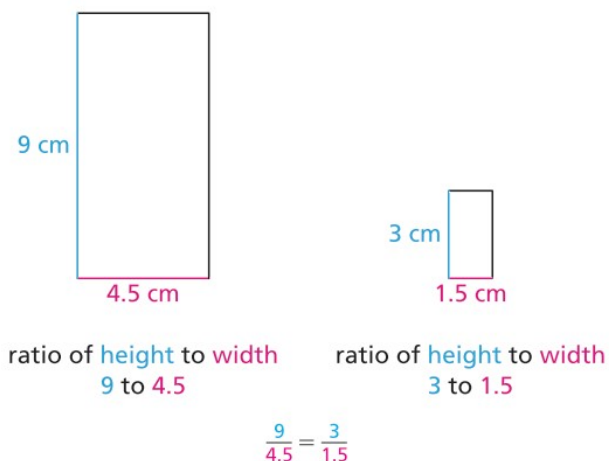# 4.2 Ratios Within Similar Triangles

Since all rectangles have four 90° angles, you can show that rectangles are similar by comparing side lengths. Jounique and Curtis each have methods to show that rectangles are similar.

Jounique explains that all scale factors between corresponding side lengths are equal for similar rectangles.

$2\frac{1}{2}$ in. $3\frac{1}{4}$ in.

$4\frac{7}{8}$ in. $3\frac{3}{4}$ in.

$$2\frac{1}{2} \times 1\frac{1}{2} = 3\frac{3}{4}$$
$$3\frac{1}{4} \times 1\frac{1}{2} = 4\frac{7}{8}$$
scale factor is $1\frac{1}{2}$

Curtis says that rectangles are similar if the ratios of corresponding adjacent sides within each shape are proportional.

9 cm   4.5 cm

3 cm   1.5 cm

ratio of height to width
9 to 4.5

ratio of height to width
3 to 1.5
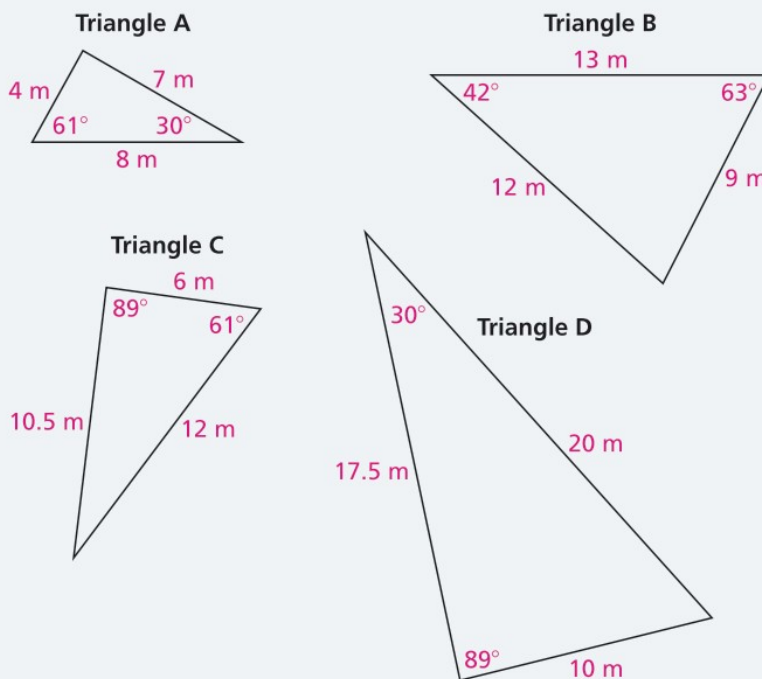
$$\frac{9}{4.5} = \frac{3}{1.5}$$

You need to compare more than just side lengths of polygons to understand their shapes. In this Problem, you will use angle measures and side-length ratios to find similar triangles.

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4/22/2015   media.pearsoncmg.com/curriculum/dash/courses/CMP3_TP_G7_20150309/course_base/resources/content_module_765/assets/521389CDE96A244154…

4.1   **4.2**   4.3   4.4

Problem 4.2

For Questions A and B, use the triangles below. The triangles are drawn to scale.

Triangle A

4 m   7 m
61°   30°
8 m

Triangle B

13 m
42°   63°
12 m   9 m

Triangle C

6 m
89°   61°
10.5 m   12 m

Triangle D

30°
17.5 m   20 m
89°   10 m

A Which triangles are similar? Explain your reasoning.

B **1.** Within each triangle, find the ratio of shortest side to longest side. Find the ratio of shortest side to "middle" side.

2. What do you notice about the ratios in part (1) for similar triangles? About the ratios for non-similar triangles?

C Choose two similar triangles. Find the scale factor from the smaller triangle to the larger triangle. What information does the scale factor give?

D Compare the information given by the ratios of side lengths in Question B to the information given by the scale factor in Question C.

A C E Homework starts on page 90.

Investigation 4   Similarity and Ratios   **85**