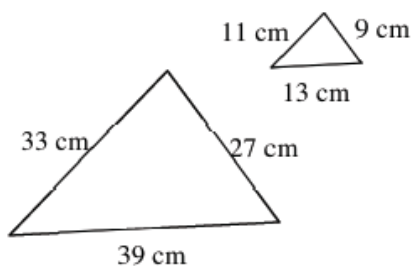


## SIMILAR FIGURES

Two figures that have the same shape but not necessarily the same size are similar. In similar figures the measures of the corresponding angles are equal and the ratios of the corresponding sides are proportional. This ratio is called the scale factor. For information about corresponding sides and angles of similar figures see Lesson 4.1.1 in the *Core Connections, Course 2* text or the Math Notes box in Lesson 6.2.2 of the *Core Connections, Course 3* text. For information about scale factor and similarity, see the Math Notes boxes in Lesson 4.1.2 of the *Core Connections, Course 2* text or Lesson 6.2.6 of the *Core Connections, Course 3* text.

### Example 1

Determine if the figures are similar. If so, what is the scale factor?

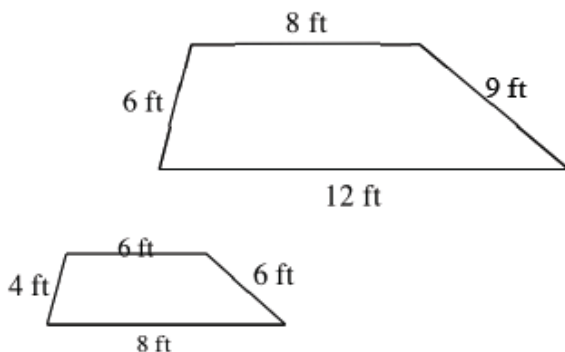


$$\frac{39}{13} = \frac{33}{11} = \frac{27}{9} = \frac{3}{1} \text{ or } 3$$

The ratios of corresponding sides are equal so the figures are similar. The scale factor that compares the small figure to the large one is 3 or 3 to 1. The scale factor that compares the large figure to the small figure is  $\frac{1}{3}$  or 1 to 3.

### Example 2

Determine if the figures are similar. If so, state the scale factor.

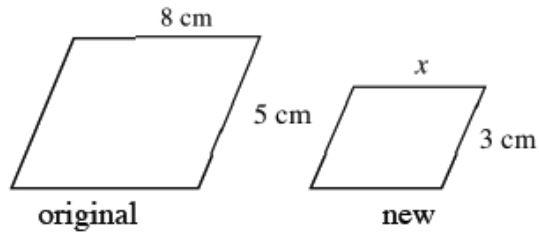


$$\frac{6}{4} = \frac{12}{8} = \frac{9}{6} \text{ and all equal } \frac{3}{2}.$$

$$\frac{8}{6} = \frac{4}{3} \text{ so the shapes are not similar.}$$

### Example 3

Determine the scale factor for the pair of similar figures. Use the scale factor to find the side length labeled with a variable.



$$\text{scale factor} = \frac{3}{5}$$

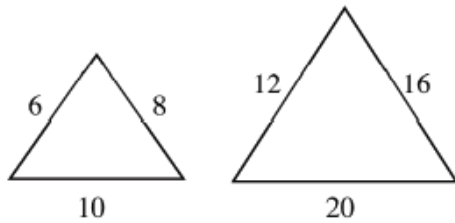
$$\text{original} \cdot \frac{3}{5} \Rightarrow \text{new}$$

$$8 \cdot \frac{3}{5} = x; \Rightarrow x = \frac{24}{5} = 4.8 \text{ cm}$$

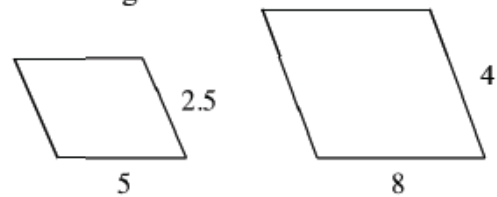
### Problems

Determine if the figures are similar. If so, state the scale factor of the first to the second.

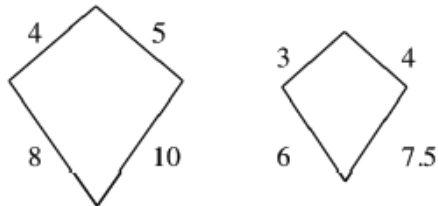
1.



2. Parallelograms

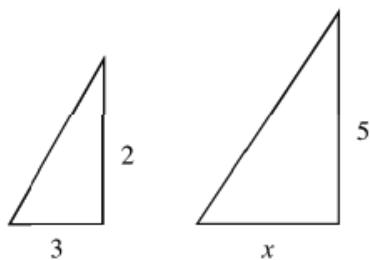


3. Kites

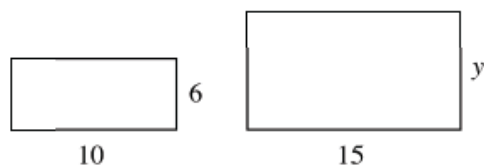


Determine the scale factor for each pair of similar figures. Use the scale factor to find the side labeled with the variable.

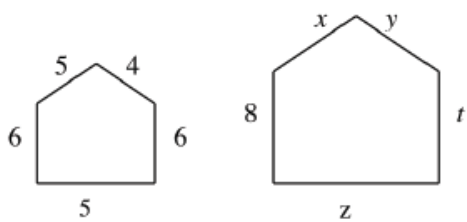
4.



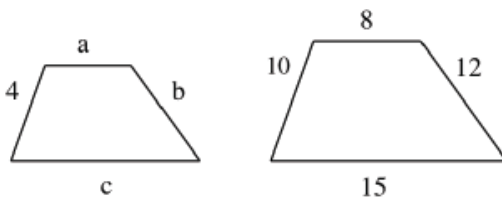
5.



6.



7.



### Answers

1. similar; 2

2. similar;  $\frac{8}{5} = 1.6$

3. not similar

4.  $\frac{5}{2}$ ;  $x = 7.5$

5.  $\frac{3}{2}$ ;  $y = 9$

6.  $\frac{4}{3}$ ;  $x = \frac{20}{3} = 6\frac{2}{3}$ ,  $y = \frac{16}{3} = 5\frac{1}{3}$ ,  $t = 8$ ,  $z = \frac{25}{3} = 8\frac{1}{3}$

7.  $\frac{5}{2}$ ;  $a = \frac{16}{5} = 3.2$ ,  $b = \frac{24}{5} = 4.8$ ,  $c = 6$