

Lesson 2.5: Similar Figures

Essential Question

How can you use proportions to help make decisions in art, design, and magazine layouts?

Key Idea

Similar Figures

Figures that have the same shape but not necessarily the same size are called **similar figures**.



Triangle ABC is similar to Triangle DEF .

Words Two figures are similar when

- corresponding side lengths are proportional and
- corresponding angles are congruent.

Symbols *Side Lengths*

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

Angles

$$\angle A \cong \angle D$$

$$\angle B \cong \angle E$$

$$\angle C \cong \angle F$$

Figures

$$\triangle ABC \sim \triangle DEF$$

can use cross multiplication to determine if proportional

"congruent" "similar"

Which rectangle is similar to Rectangle A?

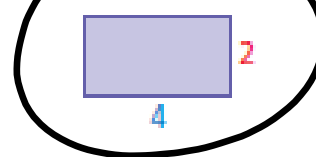
Rectangle A



Rectangle B



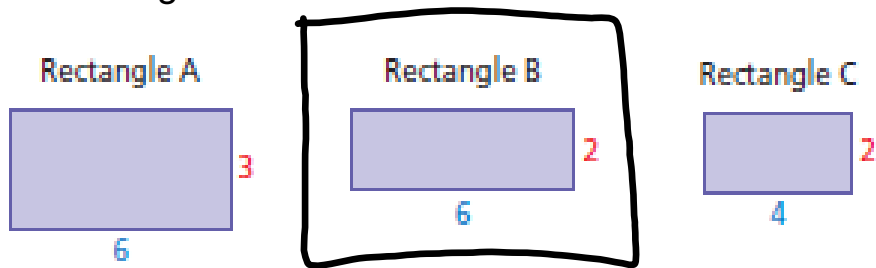
Rectangle C



~~$$\frac{3}{2} = \frac{6}{6}$$~~

$$\frac{3}{2} = \frac{6}{4} \checkmark$$

1. Rectangle D is 3 units long and 1 unit wide. Which rectangle is similar to Rectangle D?



$$\frac{3}{6} \neq \frac{1}{3}$$

$$9 \neq 6$$

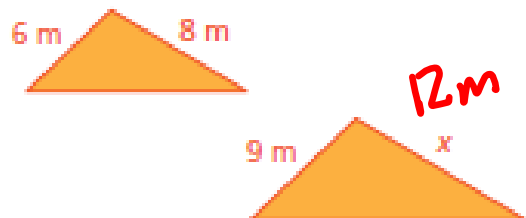
$$\frac{3}{6} = \frac{1}{2}$$

$$6 = 6 \checkmark$$

$$\frac{3}{4} \neq \frac{1}{2}$$

$$6 \neq 4$$

The triangles are similar. Find x.

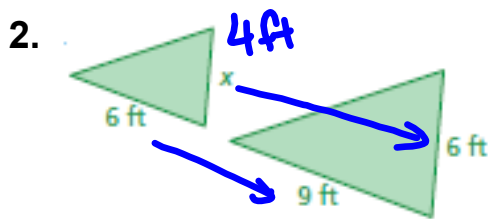


~~$$\frac{6m}{9m} = \frac{8m}{x}$$~~

$$\frac{6x}{6} = \frac{72}{6}$$

$$x = 12m$$

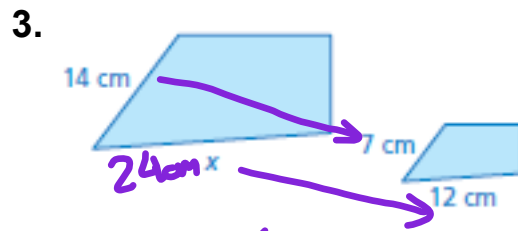
The figures are similar. Find x .



$$\frac{6\text{ ft}}{9\text{ ft}} = \frac{x}{6\text{ ft}}$$

$$9x = 36$$

$$x = \boxed{4\text{ ft}}$$

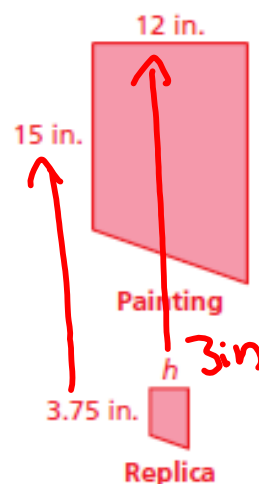


$$\frac{14\text{ cm}}{7\text{ cm}} = \frac{x}{12\text{ cm}}$$

$$7x = 168$$

$$x = \boxed{24\text{ cm}}$$

An artist draws a replica of a painting that is on the Berlin Wall. The painting includes a red trapezoid. The shorter base of the similar trapezoid in the replica is 3.75 inches. What is the height h of the trapezoid in the replica?



$$\frac{3.75\text{ in}}{15\text{ in}} = \frac{h}{12\text{ in}}$$

$$15h = 45$$

$$\begin{array}{r} 15h = 45 \\ \hline \div 15 \quad \div 15 \\ \hline h = 3 \end{array}$$

$$h = \boxed{3\text{ in}}$$