

Lesson 2.5

Learning Target: Use Proportions to

☆ Identify Similar Figures

☆ Find unknown measures.

Proportions Review

Are the Ratios Proportional?

140

140

1.

$$\frac{35}{20} = \frac{7}{4}$$

Yes

2.

$$\frac{3}{8} = \frac{32}{12}$$

3.

$$\frac{5}{13} = \frac{40}{48}$$

4.

$$\frac{9}{24} = \frac{3}{8}$$

Proportions Review 2

Solve for the missing value

1. $\frac{n}{7} = \frac{36}{28}$

Handwritten red annotations: A curved arrow above the fraction points from 36 to 7 with $\div 4$ written above it. Another curved arrow below the fraction points from 28 to 7 with $\div 4$ written below it.

9

2. $\frac{7}{4} = \frac{14}{n}$

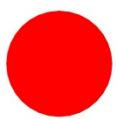
Handwritten red annotations: A curved arrow above the fraction points from 14 to 7 with $\cdot 2$ written above it. Another curved arrow below the fraction points from 4 to n with $\cdot 2$ written below it.

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~~$\frac{n}{4} = \frac{35}{10}$~~

$$\begin{aligned} 4 \cdot 35 &= 10n \\ 140 &= 10n \\ \underline{10} & \quad \underline{10} \end{aligned}$$

$n = 14$



More Practice

Tell whether the ratios form a proportion.

1. $\frac{2}{5}, \frac{10}{25}$

2. $\frac{7}{14}, \frac{21}{28}$

Find the missing value

3. $\frac{4}{n} = \frac{48}{36}$

4. $\frac{n}{50} = \frac{3}{5}$

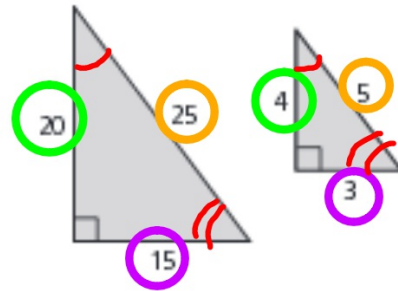
5. $\frac{9}{11} = \frac{18}{n}$

6. $\frac{18}{20} = \frac{n}{30}$

Similar Figures

Similar Figures have the same shape,
but not necessarily the same size

$$\frac{5}{1} = \frac{20}{4} = \frac{25}{5} = \frac{15}{3}$$



Two figures are similar when

- ✓ Corresponding side lengths are **proportional** and
- ✓ Corresponding angles are **congruent**

Key Vocabulary
similar figures, p. 72

Reading

The symbol \sim means is similar to.

Common Error

When writing a similarity statement, make sure to list the vertices of the figures in the correct order.

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

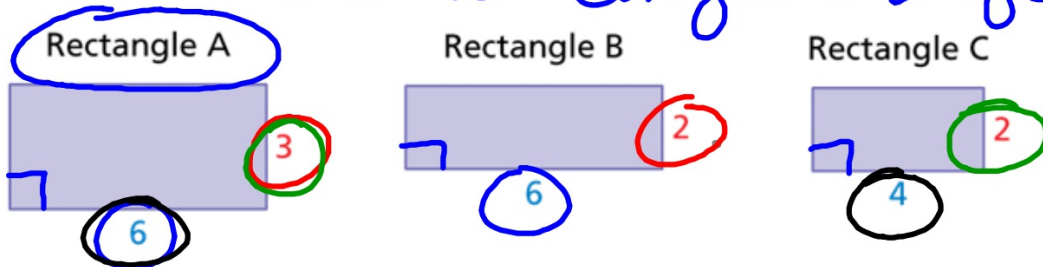
$$\triangle ABC \sim \triangle DEF$$

Similar
 \sim

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

Use Proportions to Identify Similar Figures

All have 90° congruent angles



Each figure is a rectangle. So, corresponding angles are congruent. Check to see if corresponding side lengths are proportional.

Rectangle A and Rectangle B

$$\frac{6}{6} \neq \frac{3}{2} \quad \text{Not Similar}$$

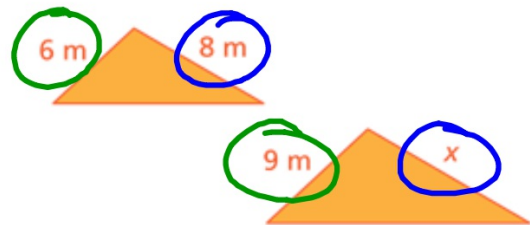
Rectangle A and Rectangle C

$$\text{Yes } \frac{6}{4} = \frac{3}{2} \quad \text{A and C are similar}$$

Use Proportions to Find Unknown Measures

The triangles are similar. Find x .

Because the triangles are similar, corresponding side lengths are proportional. So, write and solve a proportion to find x .



 s.

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

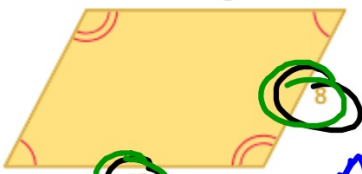
$$6x = 72$$

$$x = 12$$

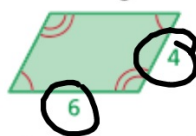
On your Own

1. Which parallelogram is similar to Parallelogram A?

Parallelogram A



Parallelogram B



Parallelogram C



A & B

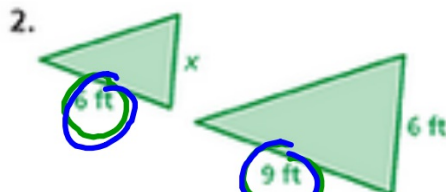
$$\frac{12}{6} = \frac{8}{4}$$

$$A \sim B$$

All corresponding angles are \sim

A to C
 $\frac{12}{6} \neq \frac{8}{6}$ Not \sim

2. The figures are similar. Find x .



~~$$\frac{6}{9} = \frac{x}{5}$$~~

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

$$\frac{36}{9} = x$$

$$4 = x$$

Homework

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