

**LESSON**  
**5**

# Proportional Relationships

## Review for Mastery: Using Similar Figures

If you know that 2 figures are similar, you can use proportions to find unknown lengths of sides, as well as find unknown angle measurements.

The triangles are similar.

Side  $AC$  corresponds to side  $DF$ .

Side  $AB$  corresponds to side  $DE$ .

Side  $BC$  corresponds to side  $EF$ .

Write a proportion comparing the lengths of a pair of corresponding sides.

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

$$\frac{5}{15} = \frac{3}{n}$$

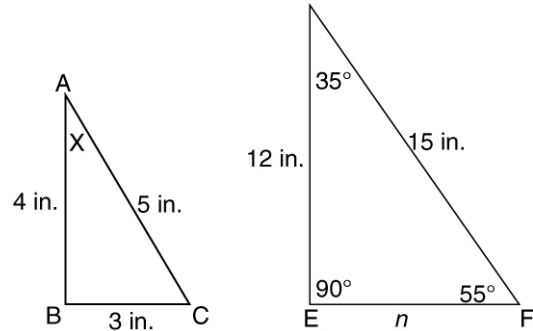
$$5 \cdot n = 15 \cdot 3$$

$$5n = 45$$

$$\frac{5n}{5} = \frac{45}{5}$$

$$n = 9$$

The length of the missing side is 9 in.

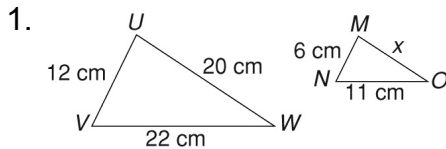


Corresponding angles of similar triangles have equal measures.

Since  $\angle A$  corresponds to  $\angle D$ ,  $x = 35^\circ$ .

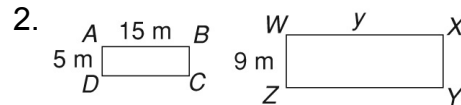
The measure of the unknown angle is  $35^\circ$ .

### Find the unknown measure in each pair of similar figures.



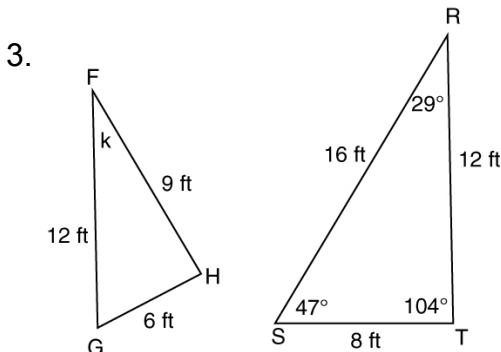
$$\frac{UW}{UV} = \frac{UW}{UV} ; \frac{20}{12} = \frac{12}{x}$$

$$x = \underline{\hspace{2cm}}$$

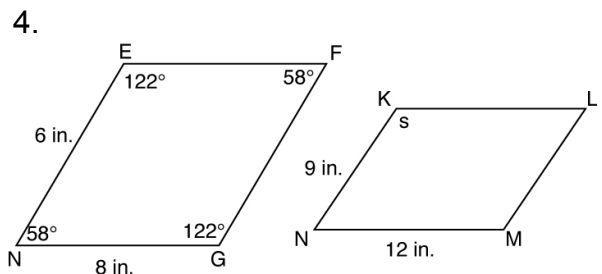


$$\frac{WZ}{WX} = \frac{WX}{WZ} ; \frac{9}{y} = \frac{y}{9}$$

$$y = \underline{\hspace{2cm}}$$



$$k = \underline{\hspace{2cm}}$$



$$s = \underline{\hspace{2cm}}$$

**Practice C**

- $x = 21.6$  yd
- $x = 56^\circ$
- $x = 26^\circ$
- $x = 22.1$  m
- 9.5 meters
- 28 feet
- 225 inches
- 112 feet

**Review for Mastery**

- $MO$ ;  $MN$ ;  $x$ ; 6;  
 $x = 10$  cm
- $AD$ ;  $AB$ ; 5;  $\frac{y}{15}$ ;  
 $y = 27$  m
- $k = 29^\circ$
- $s = 122^\circ$

**Challenge**

- 10:15; 2:3
- 8.5:11; 17:22
- No, you need to leave room to print information about the dinner.
- 2 feet by 3 feet or 1 foot by 1.5 feet
- Yes, the ratios are equal.
- 6 inches by 9 inches

**Problem Solving**

- 78 feet long
- 68 feet tall
- 25 feet wide
- 15 inches wide
- C
- F
- C

**Reading Strategies**

- Possible answer: because you are not actually measuring, but using proportions to find a missing length
- Put the lengths of the sides into the proportion
- Possible answer:  $\frac{18}{6} = \frac{y}{5}$

**Puzzles, Twisters & Teasers**

- PROPORTION
- LENGTH
- CROSS PRODUCTS
- SOLVE
- 25

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**Answers for Lesson 6****Practice A**

- C
- F
- B
- G
- $\frac{1}{2}$
- $\frac{1}{4}$
- $\frac{1}{3}$
- $\frac{1}{7}$
- 150 miles
- 64 inches

**Practice B**

- $\frac{1}{25}$
- $\frac{1}{8}$
- $\frac{1}{9}$
- $\frac{1}{11}$
- $\frac{1}{16}$
- $\frac{1}{9}$
- $\frac{1}{5}$
- $\frac{1}{14}$
- 35.2 feet
- 136 miles
- $40\frac{4}{5}$  inches

**Practice C**

- $\frac{1}{4}$
- $\frac{1}{12}$
- $\frac{1}{17}$
- $\frac{1}{21}$
- length: 56 ft; height: 2 ft
- length: 300 ft
- height: 6 in.
- height: 40 ft
- length: 9.75 in.; height: 4.125 in.
- 19 ft
- 1:95
- 150 miles
- $193\frac{1}{5}$  inches

**Review for Mastery**

- $\frac{3 \text{ in.}}{24 \text{ in.}}; \frac{1}{8}$
- $\frac{4 \text{ cm}}{20 \text{ cm}}; \frac{1}{5}$
- 84 inches
- 75 miles