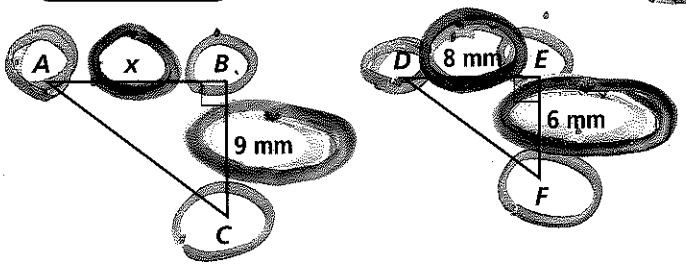
Proportions + Similar Figures

Additional Examples — Lesson 4-2

1 EXAMPLE **In the figure below, $\triangle ABC \sim \triangle DEF$. Find AB.**



~ Similar
Same angles

Relate: $\frac{EF}{BC} = \frac{DE}{AB}$ Write a proportion comparing the lengths of the corresponding sides.

Define: Let $\boxed{x} = AB$.

Write: $\frac{6}{9} = \frac{8}{\boxed{x}}$ Substitute 6 for EF, 9 for BC, 8 for DE, and x for AB.

$6x = 9(8)$ Write cross products.

$\frac{6x}{6} = \frac{72}{6}$ Divide each side by 6.

$x = 12$ Simplify.

AB is 12 mm.

2 EXAMPLE **A flagpole casts a shadow 102 feet long. A 6 ft tall man casts a shadow 17 feet long. How tall is the flagpole?**

$\frac{102}{17} = \frac{\boxed{x}}{6}$ Write a proportion.

$17x = 102 \cdot 6$ Write cross products.

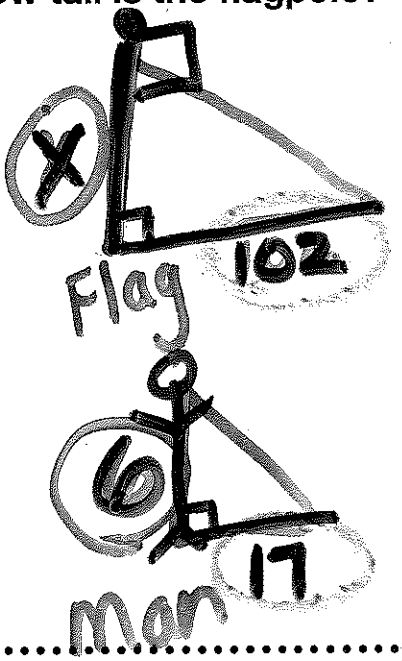
$17x = 612$ Simplify.

$\frac{17x}{17} = \frac{612}{17}$ Divide each side by 17.

$x = 36$ Simplify.

The flagpole is 36 ft tall.

Flagpole
man



3 EXAMPLE **The scale of a map is 1 inch : 10 miles. The map distance from Valkaria to Gifford is 2.25 inches. Approximately how far is the actual distance?**

$$\begin{matrix}\text{map} \longrightarrow \\ \text{actual} \longrightarrow\end{matrix} \frac{1}{10} = \frac{2.25}{\boxed{x}} \begin{matrix}\longleftarrow \text{map} \\ \longleftarrow \text{actual}\end{matrix}$$ Write a proportion.

$1 \cdot x = 10 \cdot 2.25$ Write cross products.

$x = 22.5$ Simplify.

The actual distance from Valkaria to Gifford is approximately 22.5 mi.