

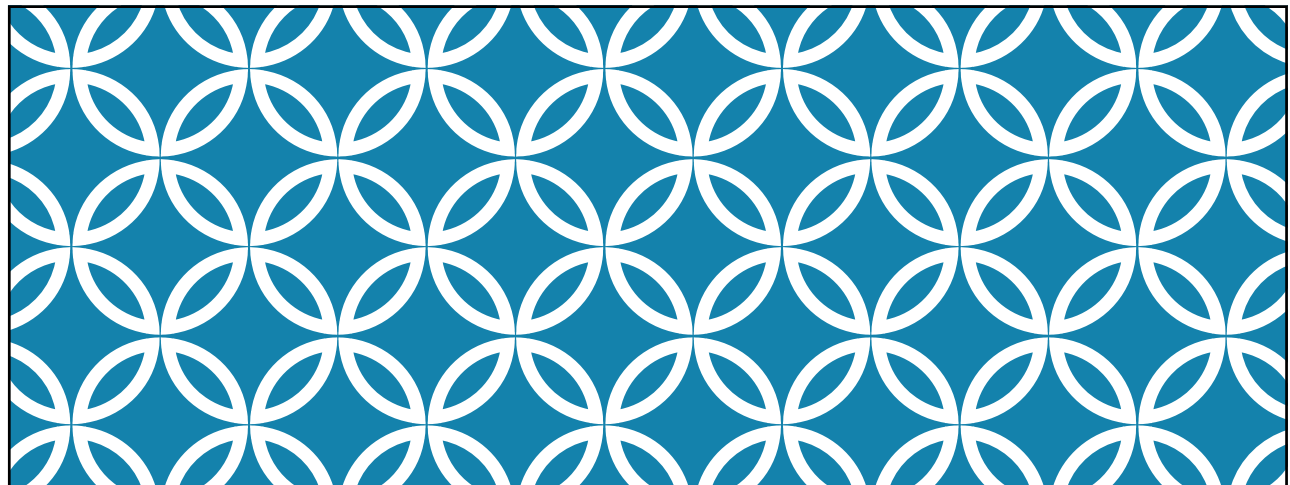
WARM-UP

1. Describe how we can solve this proportion. Find the solution of x .

$$\frac{x}{7} = \frac{4}{5}$$

$$5x = 28$$

$$x = \frac{28}{5}$$



2.8: PROPORTIONS AND SIMILAR FIGURES

Ms. Miller

TODAY'S OBJECTIVE

- We will review how to solve proportions
- Use proportions to find missing lengths in similar figures

REVIEW

- **Ratio:** compares two numbers by division $\frac{a}{b}$ $a:b$
- **Proportion:** an equation that states that 2 ratios are equal

$$\frac{a}{b} = \frac{c}{d}$$

- **Proportional relationship** can produce an infinite number of equivalent ratios

SOLVING PROPORTIONS

- **Cross Products Property of a Proportion:** cross products of a proportion are equal

$$\frac{x}{10} = \frac{2}{5}$$

$$5x = 20$$

$$x = 4$$

TRY THIS PROBLEM

$$\frac{n}{5} = \frac{2n+4}{6}$$

$$6n = 5(2n + 4)$$

$$6n = 10n + 20$$

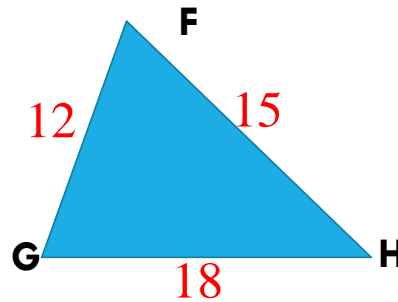
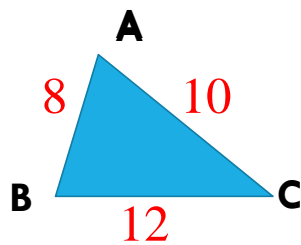
$$-4n = 20$$

$$n = -5$$

$$\triangle ABC \sim \triangle FGH$$

SIMILAR FIGURES

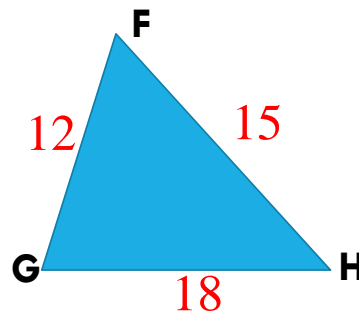
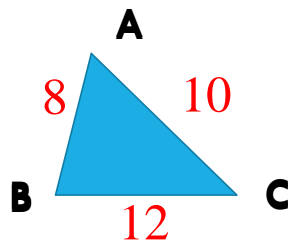
- **Similar Figures:** Have the same shape but not necessarily the same size
- In similar figures, the measures of corresponding angles are equal and the ratio of corresponding side lengths are equal



SIMILAR FIGURES - ANGLES

- The symbol \cong means “is congruent to.” Congruent angles have the same measure.

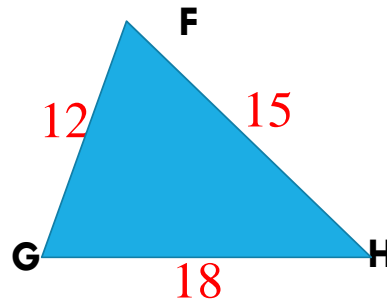
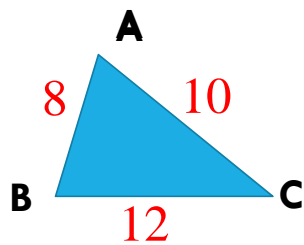
$$\angle A \cong \angle F \quad \angle B \cong \angle G \quad \angle C \cong \angle H$$



SIMILAR FIGURES — RATIO OF SIDES

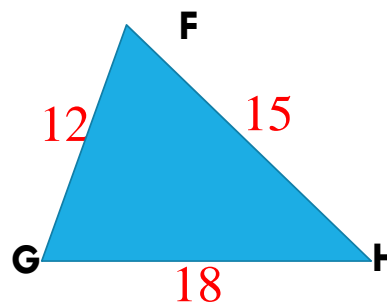
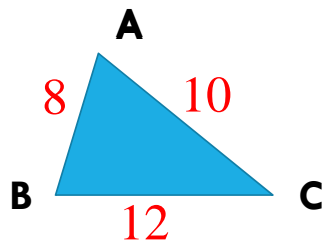
- The ratios are equal
- Name sides of triangles by line segments that make up that side

$$\frac{AB}{FG} = \frac{AC}{FH} = \frac{BC}{GH}$$



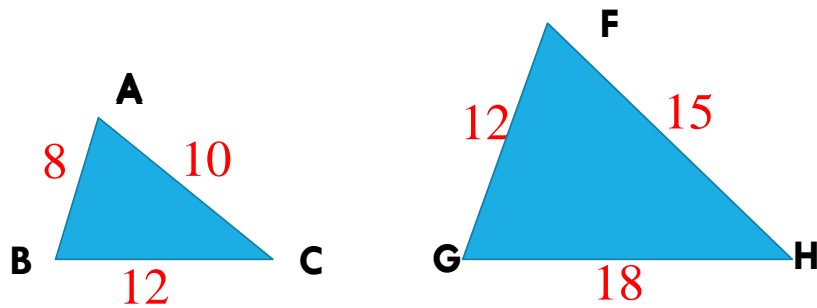
SIMILAR FIGURES — RATIO OF SIDES

$$\frac{AB}{FG} = \frac{AC}{FH} = \frac{BC}{GH} \quad \frac{8}{12} = \frac{10}{15} = \frac{12}{18} \quad \frac{2}{3} = \frac{2}{3} = \frac{2}{3}$$



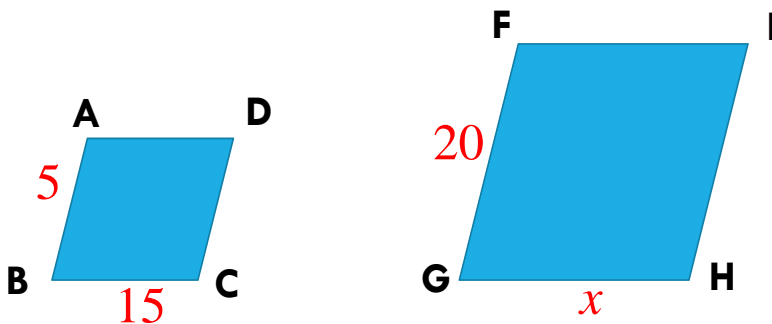
SIMILAR FIGURES

$$\triangle ABC \sim \triangle FGH$$



SIMILAR FIGURES

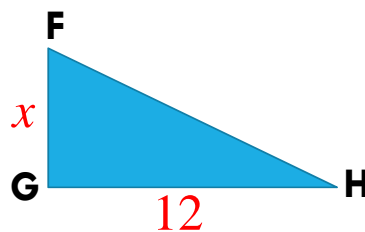
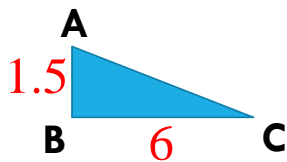
- The two figures below are similar
- Find the missing length by setting up a proportion



$$\begin{aligned}\frac{AB}{FG} &= \frac{BC}{GH} \\ \frac{5}{20} &= \frac{15}{x} \\ 5x &= 300 \\ x &= 60\end{aligned}$$

SIMILAR FIGURES

- The two figures below are similar
- Find the missing length by setting up a proportion



$$\frac{AB}{FG} = \frac{BC}{GH}$$

$$\frac{1.5}{x} = \frac{6}{12}$$

$$18 = 6x$$

$$x = 3$$

SUMMARY

- **Similar figures** have the same shape but not necessarily the same size
- These figures can help **measure** real-world distances indirectly
- Determine which side lengths correspond to each other in similar figures
- When one side length is unknown, we can create a **proportion** and solve for it

TONIGHT'S HOMEWORK

Complete Worksheet