Defining and Applying Similarity
AA Similarity, SAS Similarity, SSS Similarity and Right Triangle Similarity
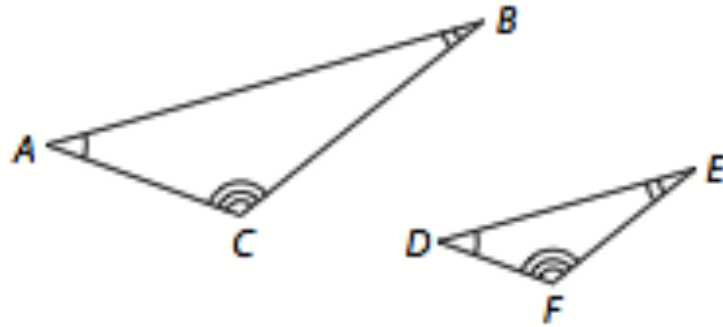
By the end of this lesson, I will be able to answer the following questions…

1. How do I decide if two triangles and similar?

2. What are the *short-cuts* to determining if triangles are similar?

Vocabulary

1. **Similarity in Triangles:**
   - Corresponding angles are congruent.
   - Corresponding sides are proportional.

2. **Similarity Statement:** Angles are corresponding and the similarity is denoted by a $\sim$ symbol. For example, the triangles above are similar and that can be denoted by the following similarity statement.....

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

Prerequisite Skills with Practice

Working with proportions.

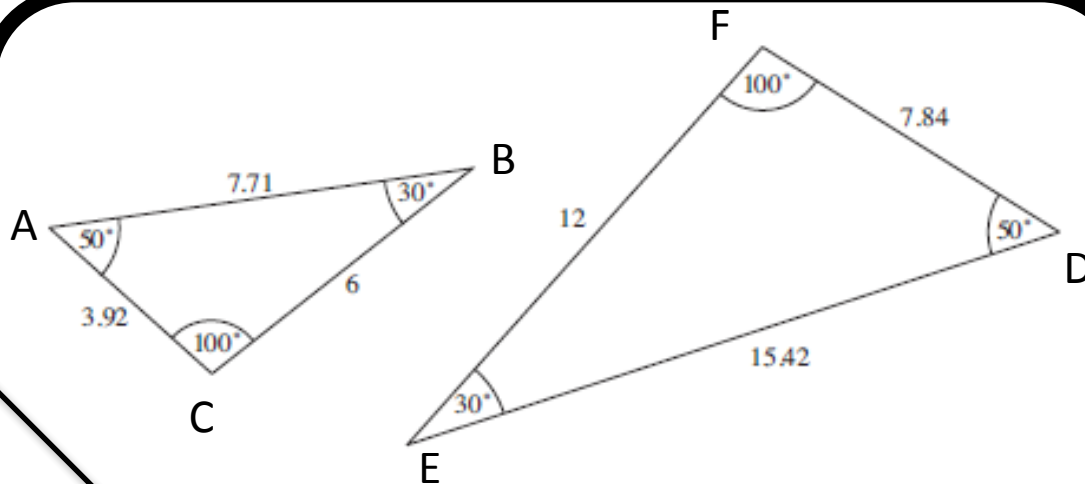$$\frac{16}{x+1}=\frac{4}{3}$$

$$\frac{1}{2x+1}=\frac{3}{7x}$$

Converting feet/inches to decimals

$$10'3''$$

Are the triangles to the left similar?

☐ Corresponding Angles Are Congruent
☐ Corresponding Sides Are Proportional

Use similarity to fill in missing info...

$m\angle A =$ $m\angle D =$

$m\angle B =$ $m\angle E =$

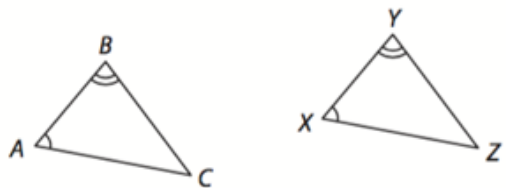$m\angle C =$ $m\angle F =$

$\dfrac{AB}{DE} =$

$\dfrac{AC}{DF} =$

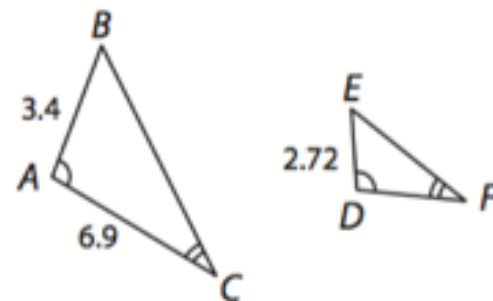$\dfrac{CB}{FE} =$

Similarity Shortcut #1

AA Similarity: Given two triangles - if two sets of corresponding angles are congruent, then the triangles are similar.

$\triangle ABC \sim \triangle XYZ$

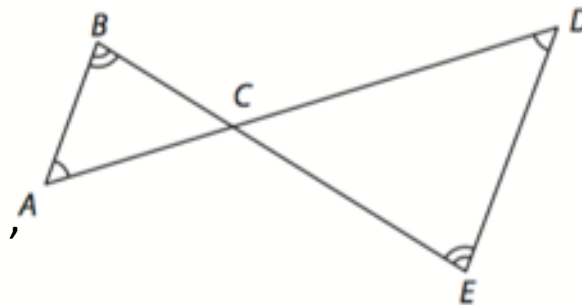Explain why $\triangle ABC \sim \triangle DEF$, and then find the length of $\overline{DF}$.

Since ∠ _____ is congruent to ∠ _____ AND ∠ _____ is congruent to ∠ _____ ,

$\triangle$ _____ $\sim \triangle$ _____

by **AA Similarity.**

Explain why the triangles are similar and write a similarity statement.

Since ∠ _____ is congruent to ∠ _____ AND ∠ _____ is congruent to ∠ _____ ,

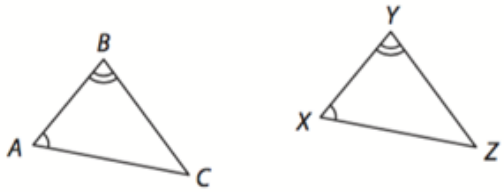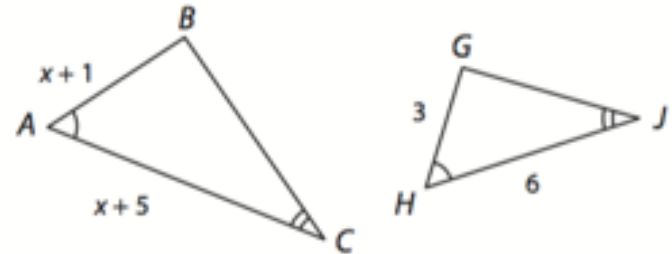$\triangle$ _____ $\sim \triangle$ _____

by **AA Similarity.**

Similarity Shortcut #1

AA Similarity: Given two triangles - if two sets of corresponding angles, then the triangles are similar.

$\triangle ABC \sim \triangle XYZ$

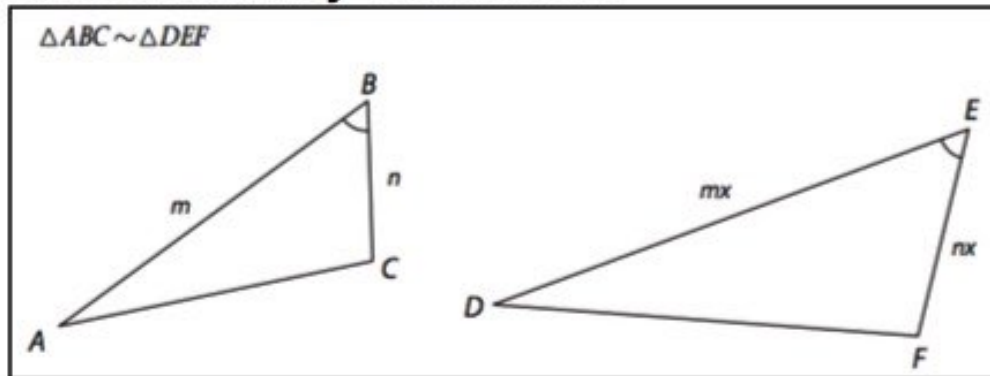Identify the similar triangles. Find x and the measures of the indicated sides.

$\triangle$_____ $\sim \triangle$_____

Suppose a person 5 feet 10 inches tall casts a shadow that is 3 feet 6 inches long. At the same time of day, a flagpole casts a shadow that is 12 feet long. To the nearest foot, how tall is the flagpole?
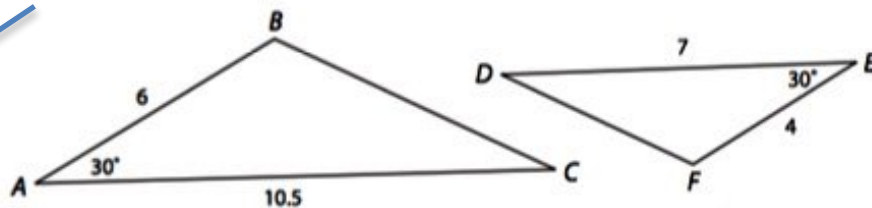
SAS Similarity: Given two triangles - if two sets of corresponding sides are proportional and the included angle is congruent, then the triangles are similar.

Since two corresponding sides are proportional to one another and the included is congruent,

△_____ ~△_____

by **SAS Similarity.**

SAS Similarity Statement

$\triangle ABC \sim \triangle DEF$

Determine whether the triangles are similar. Explain your reasoning.

$$\frac{\text{big } \triangle}{\text{small } \triangle} = \frac{AB}{EF} =$$

Included angle is congruent?

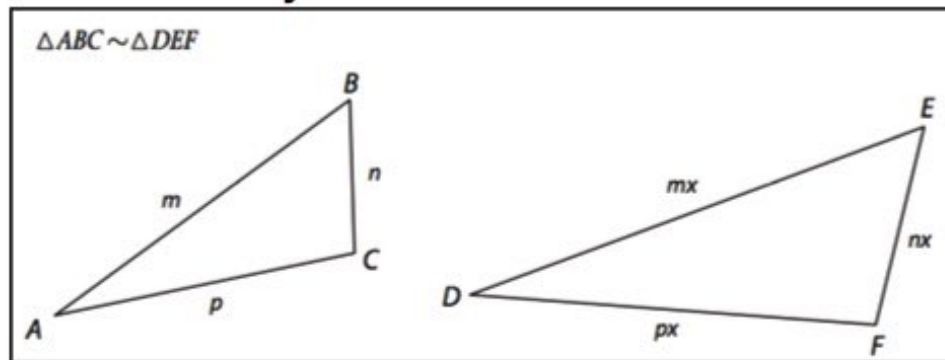$$\frac{\text{big } \triangle}{\text{small } \triangle} = \frac{AC}{DE} =$$

SSS Similarity: Given two triangles - if all corresponding sides and proportional, then the triangles are similar.

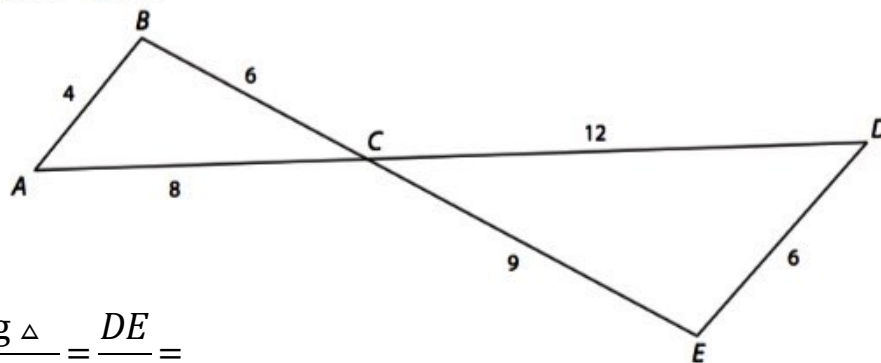Since ALL corresponding sides are proportional to one another

$\triangle$_____ $\sim \triangle$_____

by **SSS Similarity.**

SSS Similarity Statement

$\triangle ABC \sim \triangle DEF$

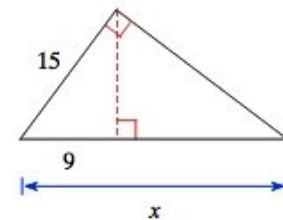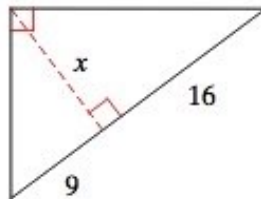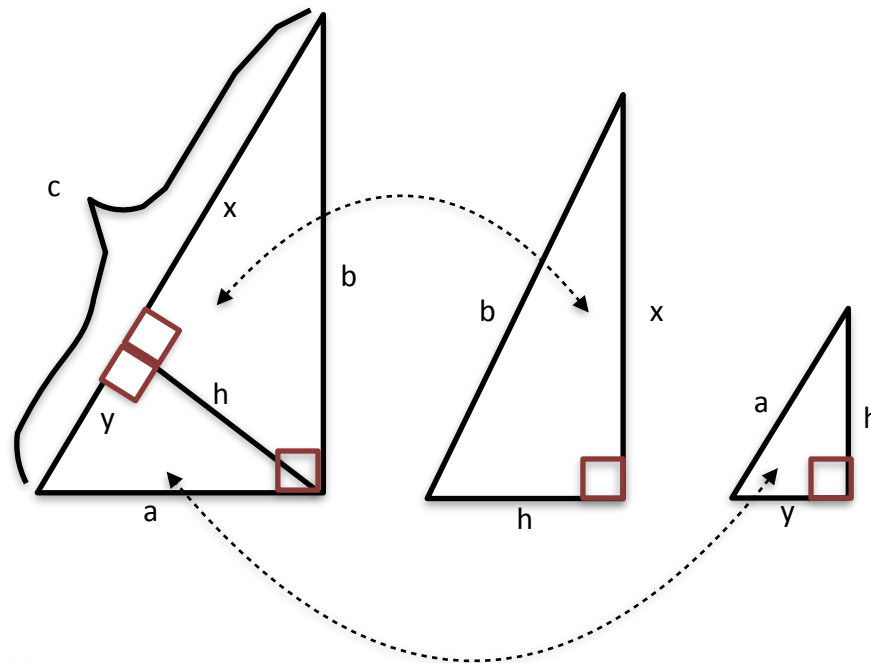Prove $\triangle ABC \sim \triangle DEC$.

$$\frac{\text{big } \triangle}{\text{small } \triangle} = \frac{DE}{AB} =$$

$$\frac{\text{big } \triangle}{\text{small } \triangle} = \frac{CD}{AC} =$$

$$\frac{\text{big } \triangle}{\text{small } \triangle} = \frac{CE}{BC} =$$

Use PlottsMath and *colored pencils* to create a template for calculations. We will use this template to solve the problems below.

THE END

Visit PlottsMath for assignment details