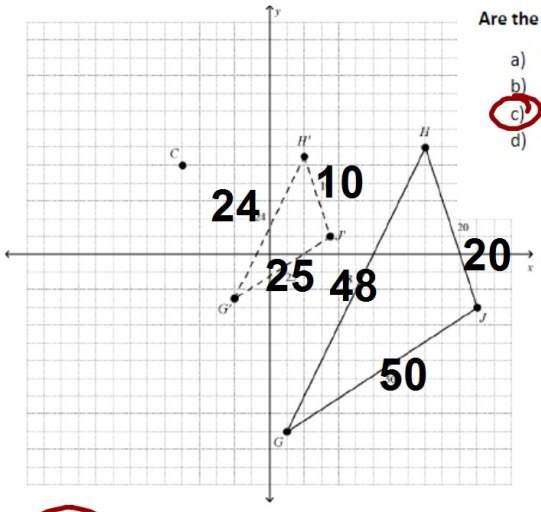
Warm-up
Take out yesterday's homework

Determine the scale factor of the dilation below.

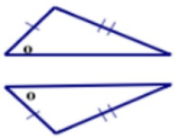


A. $k=\frac{1}{2}$ B. $k=2$ C. $k=\frac{1}{3}$ D. $k=1$

#4.

Are the following triangles congruent? If so, by what statement?

a) Yes, they are congruent by AAS statement
b) Yes, they are congruent by AAA statement
c) No, they are not congruent
d) Yes, they are congruent by SAS statement

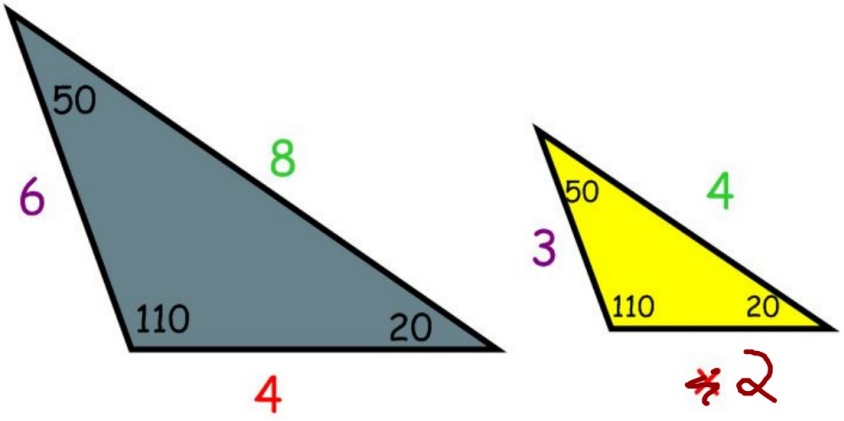


Agenda!

1. Similar Triangles and Ratios!
2. Independent Practice.
3. Exit Ticket.

Similar Triangles

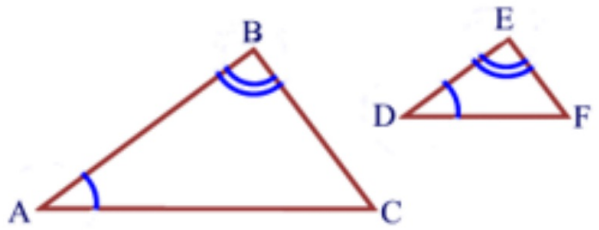
Definition: Two triangles are Similar if and only of the corresponding sides are in proportion and the corresponding angles and congruent.



- **Congruent triangles have corresponding parts with Side lengths that are the same and angles that are the same.**
- **Similar triangles have the same shape, but may be different in size.**
- **It is possible for two triangles to be Similar but not Congruent.**
- **Determining similarity is based on angles measures and ratios of the sides of the triangles**

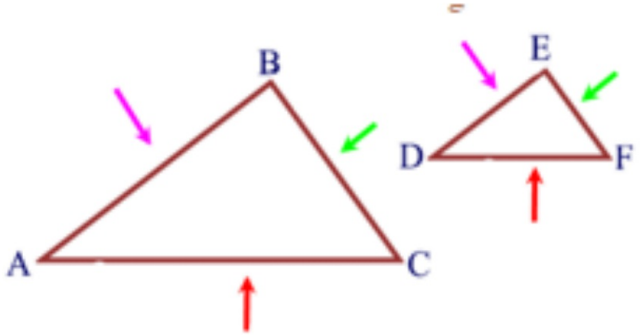
There are THREE accepted methods for proving similar triangles

AA: If two angles of one triangle are congruent to two angles of another triangle, the triangles are similar.



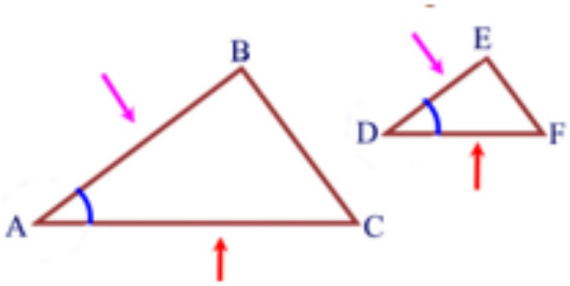
If: $\measuredangle A \cong \measuredangle D$, $\measuredangle B \cong \measuredangle E$ Then: $\Delta ABC \sim \Delta DEF$

SSS: If the three sets of corresponding sides of two triangles are in proportion, the triangles are similar.



If: $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$ Then: $\Delta ABC \sim \Delta DEF$

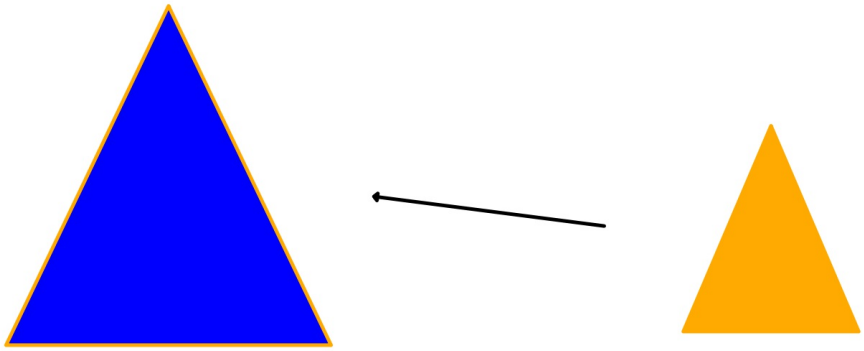
SAS: If an angle of one triangle is congruent to the corresponding angle of another triangle and the lengths of the sides including these angles are in proportion, the triangles are similar.



If: $\measuredangle A \cong \measuredangle D$

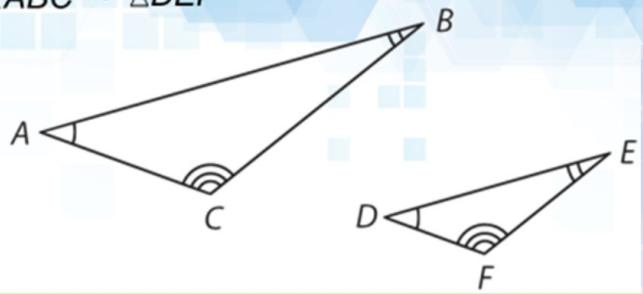
$$\frac{AB}{DE} = \frac{AC}{DF}$$

Then: $\Delta ABC \sim \Delta DEF$



- Observe the diagrams of $\triangle ABC$ and $\triangle DEF$.
- The symbol for similarity ($\sim$) is used to show that figures are similar.

$\triangle ABC \sim \triangle DEF$



$\angle A \cong \angle D$

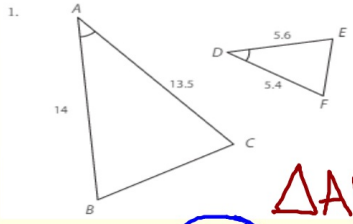
$\angle B \cong \angle E$

$\angle C \cong \angle F$

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

Definition:

1.



It could be (AA / SSS / SAS)

How? $\angle A \cong \angle D$ $\frac{AB}{DE} = \frac{14}{5.6} = 2.5$ $\frac{AC}{DF} = \frac{13.5}{5.4} = 2.5$

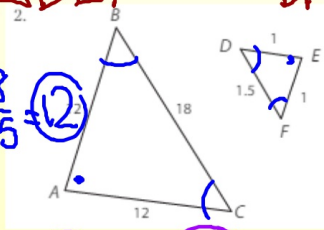
Conclusion? $\triangle ABC \sim \triangle DEF$

It could be (AA / SSS / SAS)

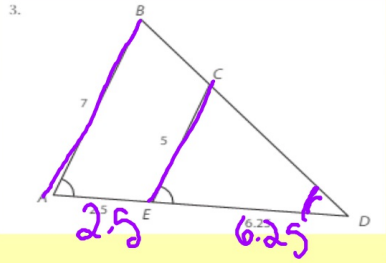
How? $\frac{AB}{ED} = \frac{12}{1} = 12$ $\frac{AC}{EF} = \frac{12}{1} = 12$ $\frac{BC}{DF} = \frac{18}{1.5} = 12$

Conclusion? $\triangle ABC \sim \triangle EDF$

2.



3.



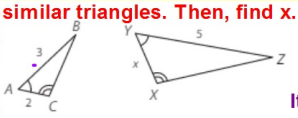
It could be (AA / SSS / SAS)

How? $\angle A \cong \angle E$ $\frac{AB}{EC} = \frac{7}{5} = 1.4$

Conclusion? $\frac{AD}{ED} = \frac{8.75}{6.25} = 1.4$

$\triangle ABD \sim \triangle ECD$

4. **Identify the similar triangles. Then, find x.**



$\angle A \cong \angle Y$

$\angle C \cong \angle X$

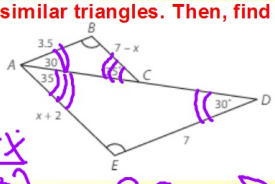
It could be (AA / SSS / SAS)

$\triangle ABC \sim \triangle YZX$

How?

$\frac{3}{5} = \frac{2}{x}$ $\quad \frac{3x}{3} = \frac{10}{3}$ $\quad x = \frac{10}{3}$

5. **Identify the similar triangles. Then, find x.**



It could be (AA / SSS / SAS)

How?

$\frac{3.5}{7} = \frac{7-x}{x+2}$

$3.5x + 7 = 49 - 7x$

$+7x \qquad +7x$

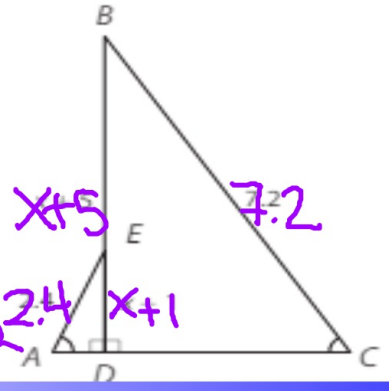
$10.5x + 7 = 49$

$-7 \quad -7$

$\frac{10.5x}{10.5} = \frac{42}{10.5}$

$x = 4$

6.



$\frac{2.4}{7.2} = \frac{x+1}{x+5}$

$2.4x + 12 = 7.2x + 7.2$

$-2.4x \qquad -2.4x$

$12 = 4.8x + 7.2$

$-7.2 \qquad -7.2$

$\frac{4.8}{4.8} = \frac{4.8x}{4.8}$

$x = 1$

Common Misconceptions

- Incorrectly identifying corresponding parts of triangles
- Assuming corresponding parts indicate congruent parts
- Setting up to proportions inconsistently

Independent Practice

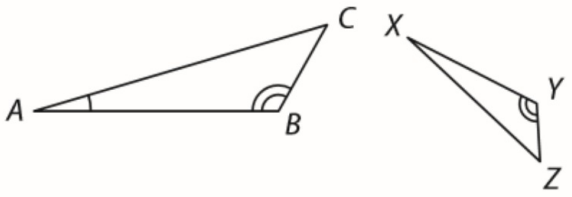
1. Write down the problem (on your own paper!)
2. Solve out the problem with your partner on the whiteboard.
3. Each question has limited time!

Expectations:
- Work with your partner.

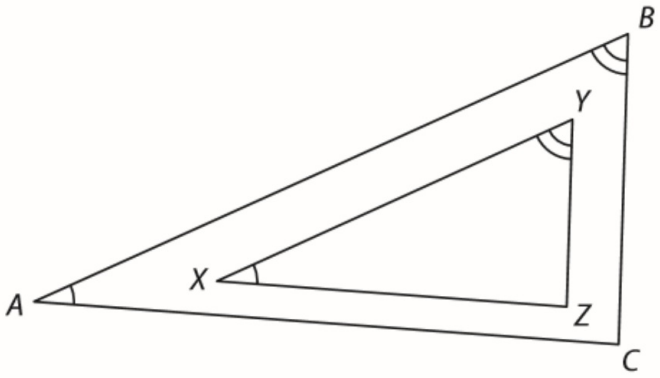
Sentence starters:
- "I think this _____ corresponds with _____".
- "It is similar by_____ theorem because..."
- "Proportion is _____ because..."

Decide whether each pair of triangles is similar. Explain your answer.

1.

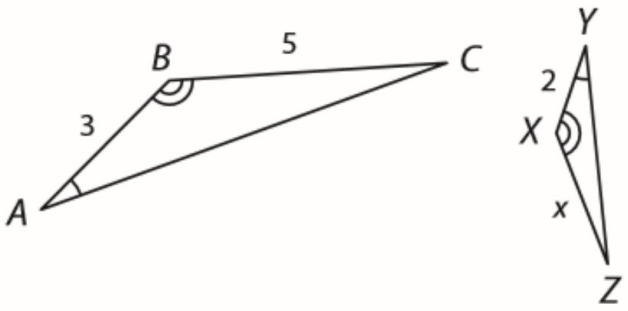


2.



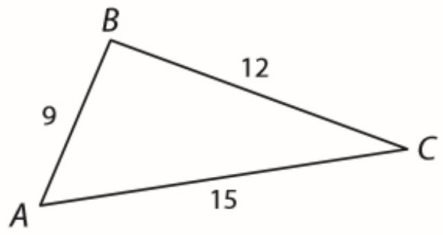
Identify the similar triangles. Find x and the measure of the indicated sides.

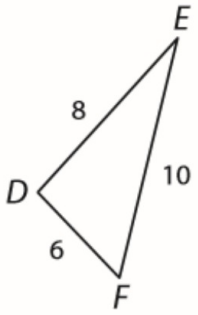
4.



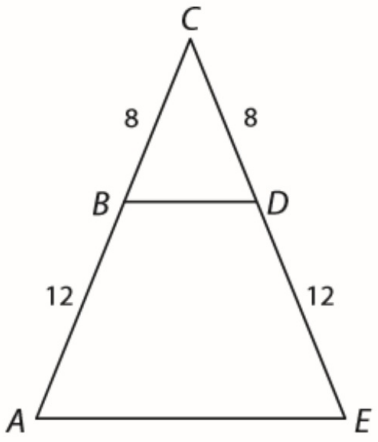
Prove that the triangles are similar.

1.



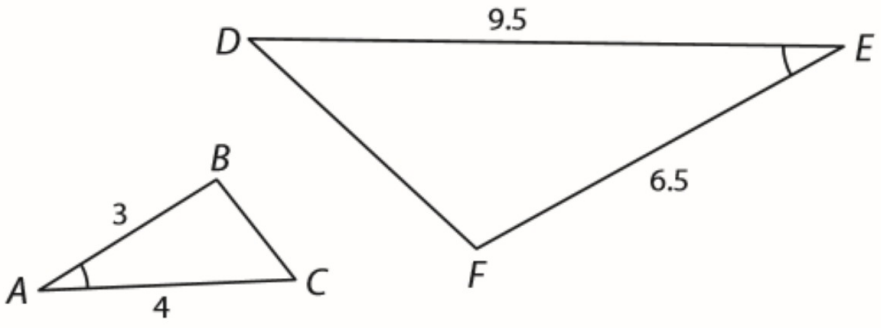


2.



Determine whether the triangles are similar. If the triangles are similar, write a similarity statement.

4.



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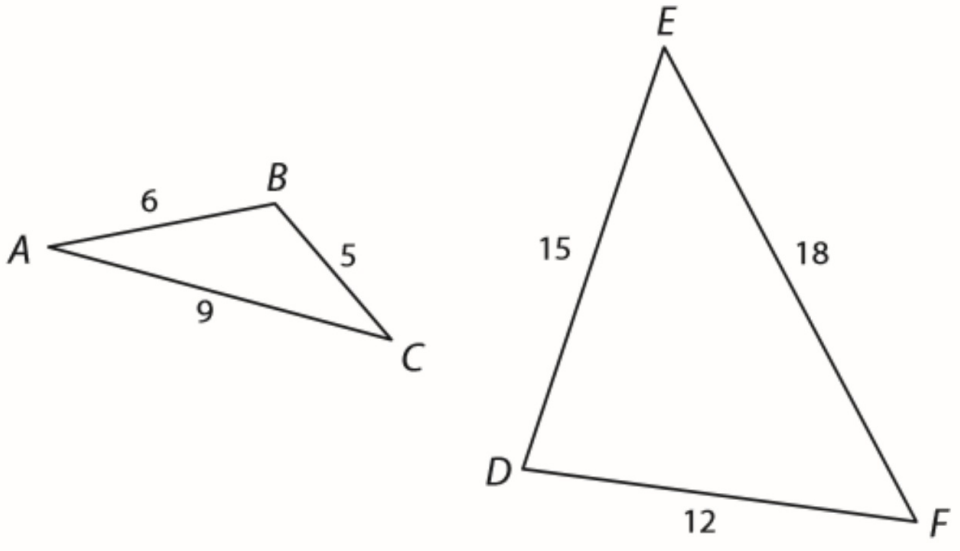
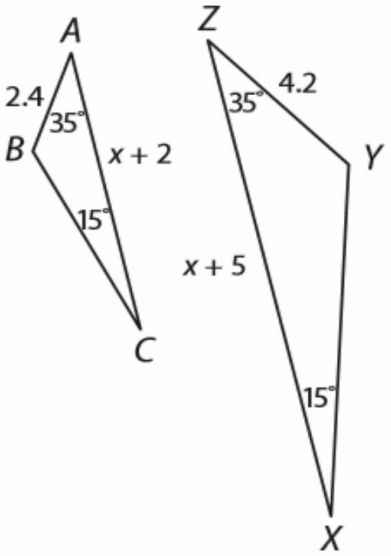
6.



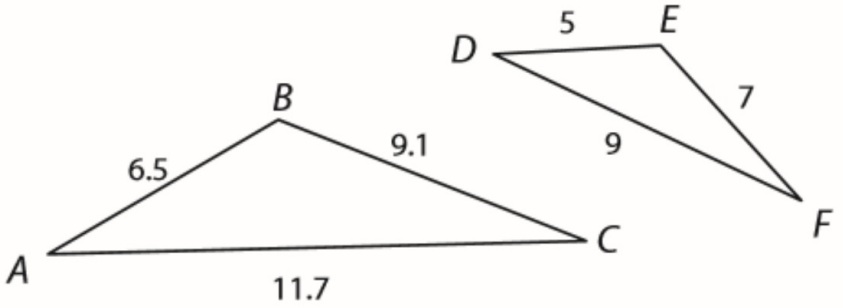
Identify the similar triangles. Find x and the measure of the indicated sides.

5.

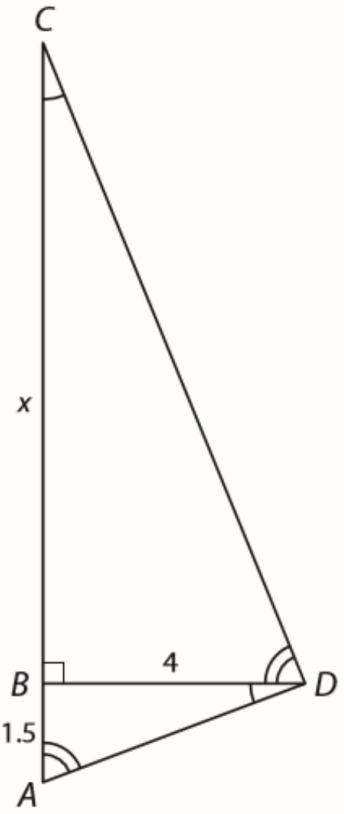


Determine whether the triangles are similar. If the triangles are similar, write a similarity statement.

7.

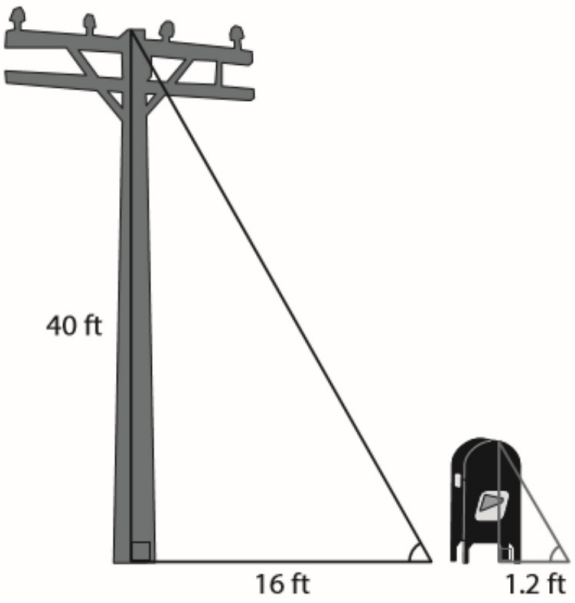


6. Identify the similar triangles. Find x and the measure of the indicated sides.

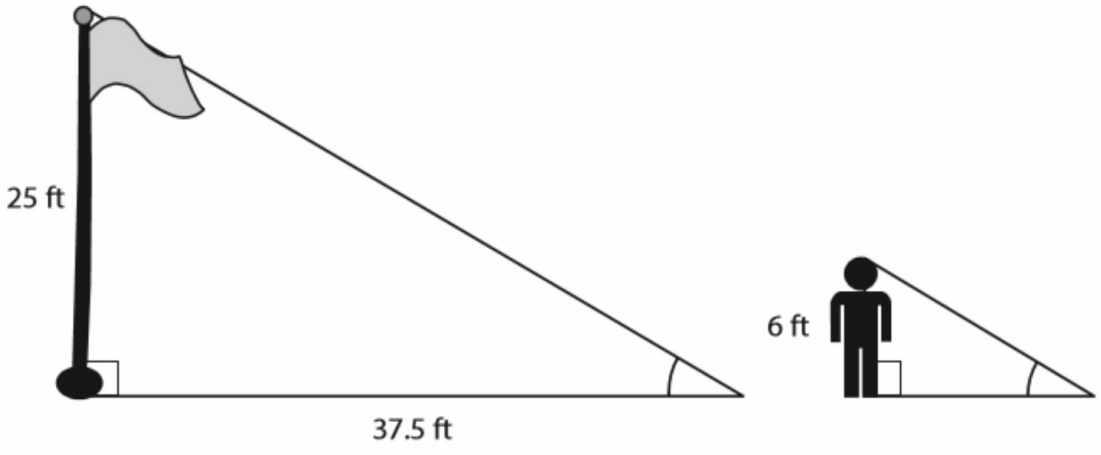


Use the definition of similarity to solve each problem.

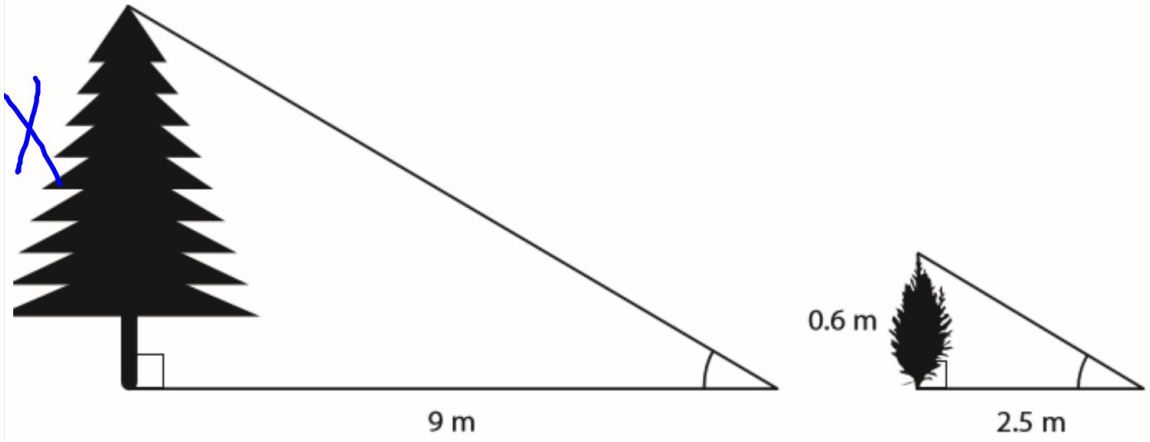
7. A telephone pole that is 40 feet tall casts a shadow that is 16 feet long. Find the height of a mailbox that casts a 1.2-foot shadow.



8. A 25-foot flagpole casts a shadow that is 37.5 feet long. A man standing near the flagpole is 6 feet tall. At the same time of day, how long is his shadow?

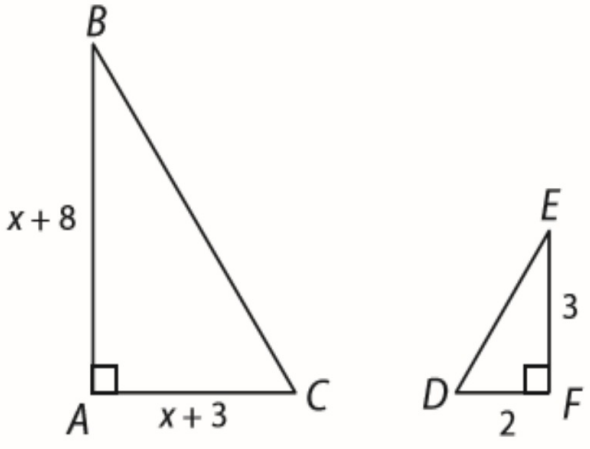


9. A tree on a tree farm casts a shadow 9 meters long. A shrub near the tree casts a shadow 2.5 meters long. If the shrub is 0.6 meters high, how tall is the tree?



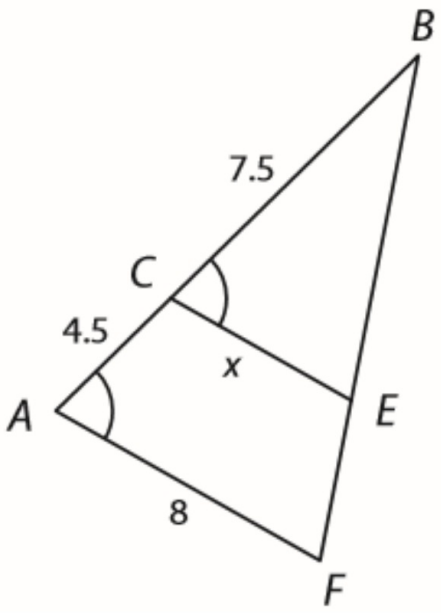
Determine whether the triangles are similar. If the triangles are similar, write a similarity statement.

8.



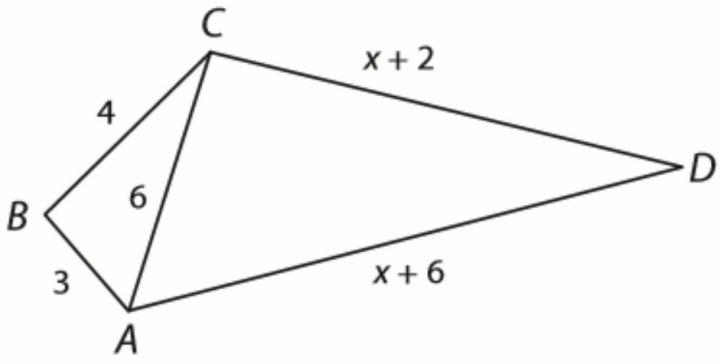
Determine whether the triangles are similar. If the triangles are similar, write a similarity statement.

9.



Determine whether the triangles are similar. If the triangles are similar, write a similarity statement.

10.



In 140 characters or 25 words (whatever comes first), summarize today's lesson on Similar Triangles.

In 140 characters or 25 words, describe the difference between:

Congrunecy

Similarity

Extra Independent Practice

Complete the independent practice on your own

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