7-3

Similar Triangles

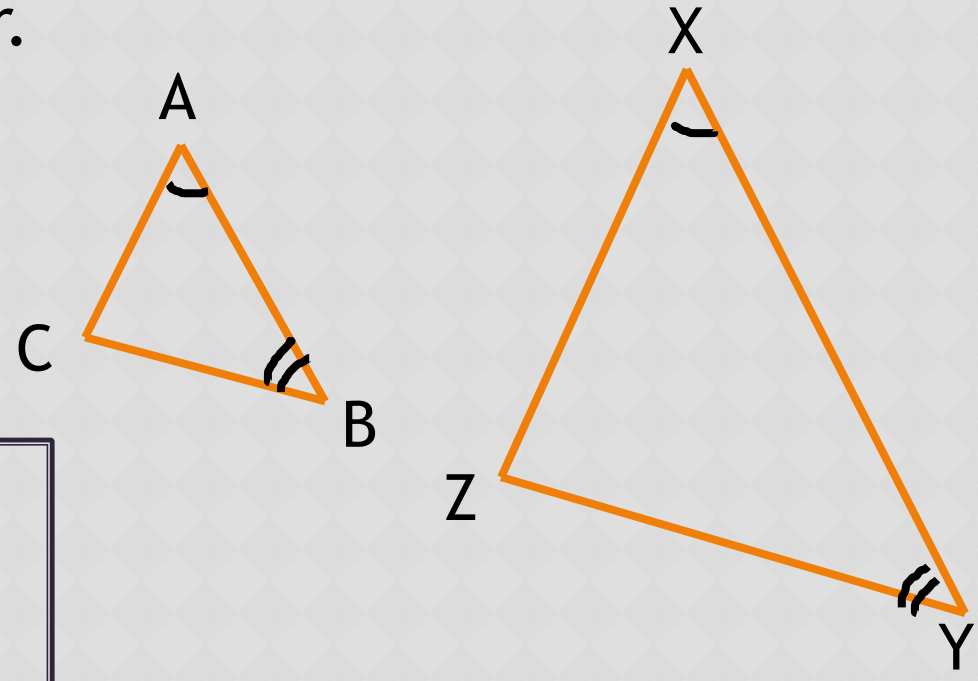
OBJECTIVES

- To use the AA Similarity Postulate and the SAS Similarity and SSS Similarity Theorems
- To use similarity to solve real-world problems

VOCABULARY

Angle-Angle Similarity Postulate (AA~):

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

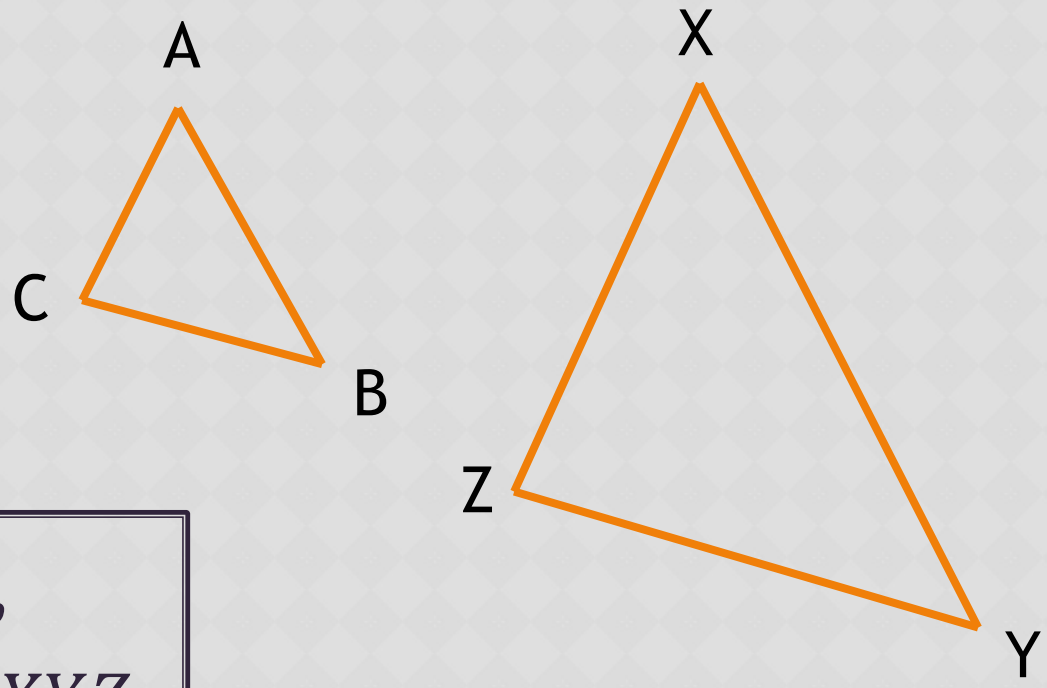


If $\angle A \cong \angle X$ and $\angle B \cong \angle Y$, then $\Delta ABC \sim \Delta XYZ$.

VOCABULARY

Side-Side-Side Similarity Theorem (SSS~):

If the corresponding sides of two triangles are proportional, then the triangles are similar.

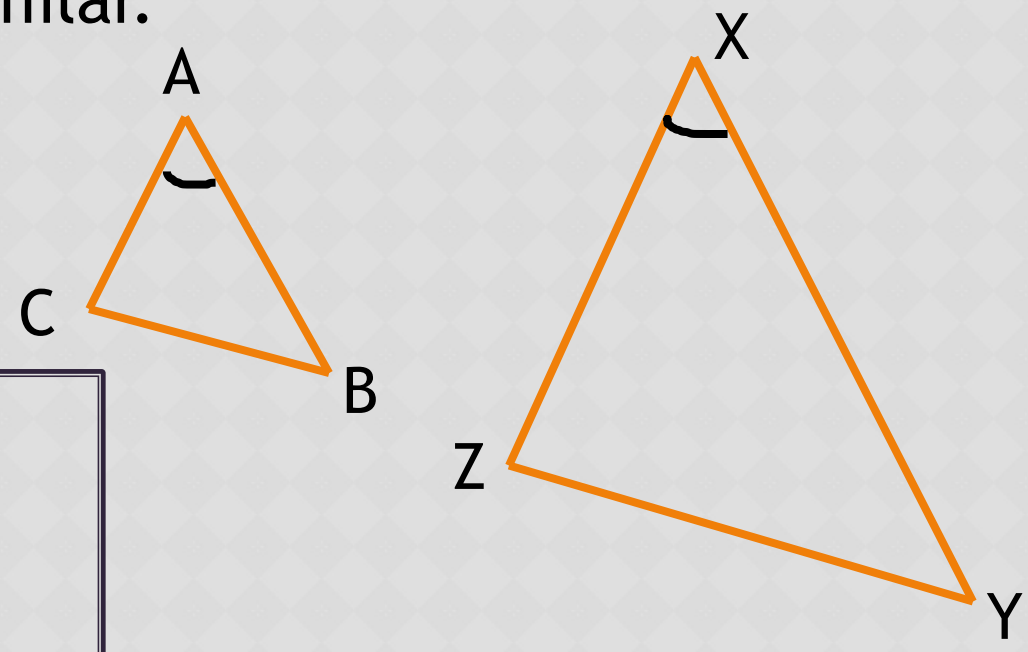


If $\frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$,
then $\Delta ABC \sim \Delta XYZ$

VOCABULARY

Side-Angle-Side Similarity Theorem (SAS~):

If an angle of one triangle is congruent to an angle of a second triangle and the sides that include the two angles are proportional, then the triangles are similar.

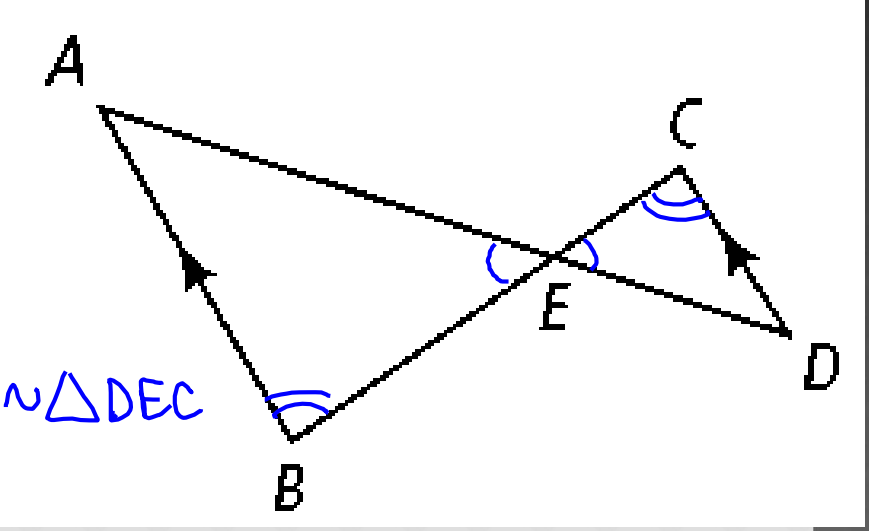


If $\angle A \cong \angle X$ and $\frac{AB}{XY} = \frac{AC}{XZ}$, then $\Delta ABC \sim \Delta XYZ$

CLASS WORK

Determine whether the triangles are similar. If so, write a similarity statement and name the postulate or theorem you used. If not, explain.

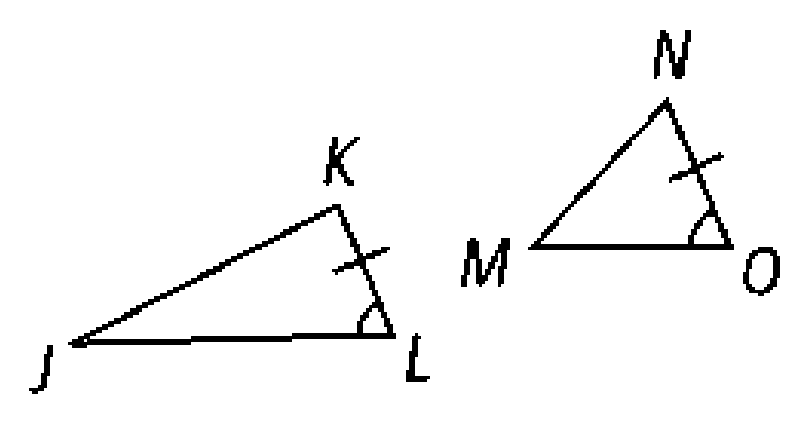
1.



AA ~

△AEB ~ △DEC

2.



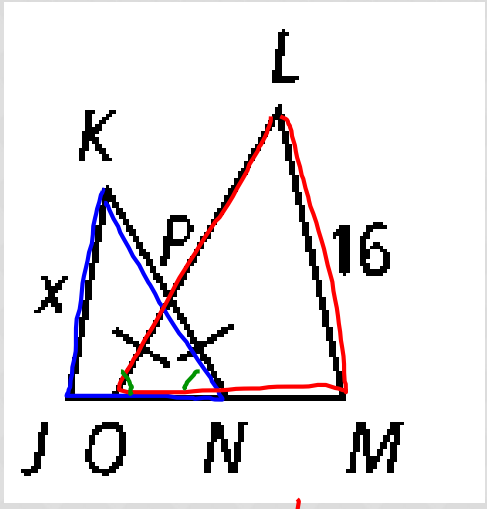
not enough information

CLASS WORK

3. Explain why the triangles are similar. Then find the value of *x*.

KN = 15, LO = 20,

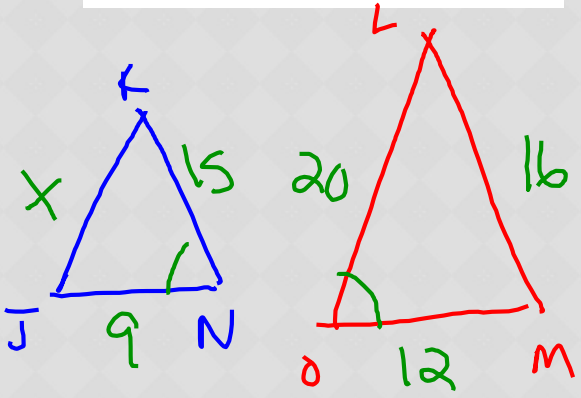
JN = 9, MO = 12



$\angle N \cong \angle O$ SAS ~

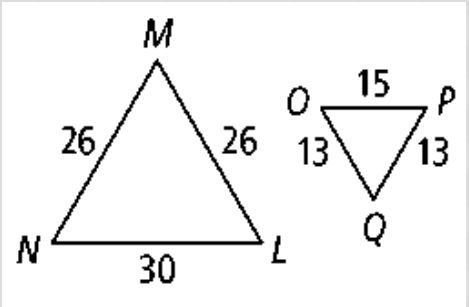
$\frac{9}{12} = \frac{15}{20}$ $SR = \frac{3}{4}$ ✓

$\frac{3}{4} = \frac{x}{16}$ $4x = 48$ $x = 12$

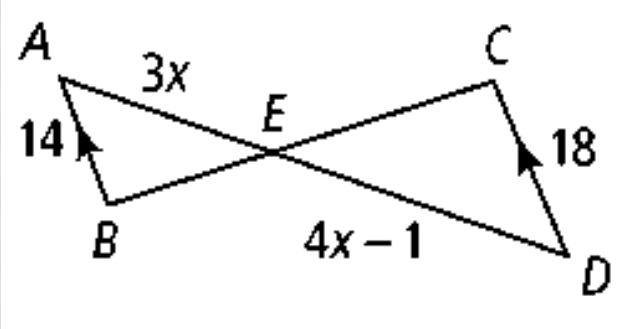


EXIT PROBLEMS

5. Determine whether the triangles are similar. If so, write a similarity statement and name the postulate or theorem you used. If not, explain.



6. Explain why the triangles are similar. Then find the value of x.



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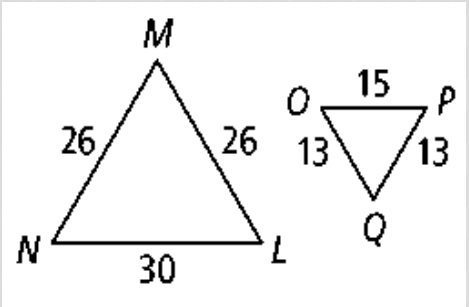
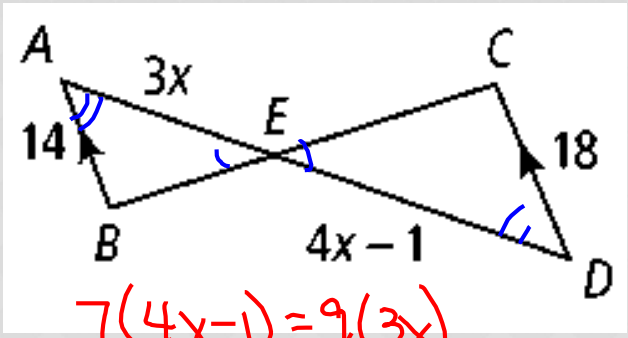


$\frac{26}{13} = \frac{30}{15}$ ✓ $SR = \frac{2}{1}$ SSS ~

6. Explain why the triangles are similar. Then find the value of x.

AA ~



$SR = \frac{14}{18} = \frac{7}{9}$

$\frac{7}{9} = \frac{3x}{4x-1}$

$7(4x-1) = 9(3x)$

$28x - 7 = 27x$

$x = 7$

SUMMARY

You can prove triangles similar with the following information:

AA~ Postulate – two pairs of congruent angles

SAS ~ Theorem – two pairs of proportional sides and the included angles congruent

SSS ~ Theorem – three pairs of proportional sides

LEARNING RUBRIC

Got It: Applies the properties of similar triangles to solve real world problems.

Almost There: Applies the properties of similar triangles to solve for expressions in a diagram.

Moving Forward: Applies the Postulate and Theorems to prove two triangles similar, and writes similarity statements.

Getting Started: Identifies the congruent angles and proportional sides in a similarity statement.

HOMEWORK

Pages 487 – 489

12 – 16 even

19, 20, 22, 24

32 – 37 all