

Triangle Similarity & Congruence 7.5 & 7.6  
(Similar Triangles)

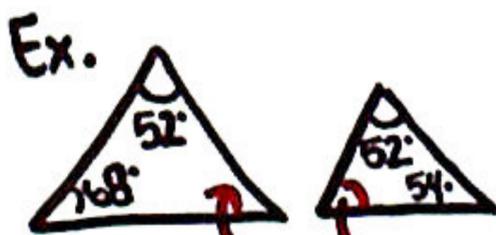
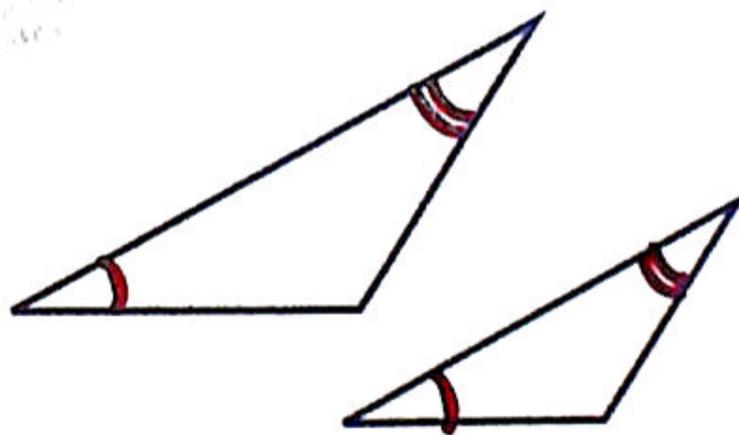
**Content Objective:** I will know how to identify similar triangles using AA, SSS and SAS Similarity  
**Language Objective:** I will be able to solve problems using properties of similar triangles  
**Question:** What evidence is needed to prove that triangles are similar?

Study Question(s)

3 Ways to Prove Triangles are Similar

① Angle-Angle Similarity

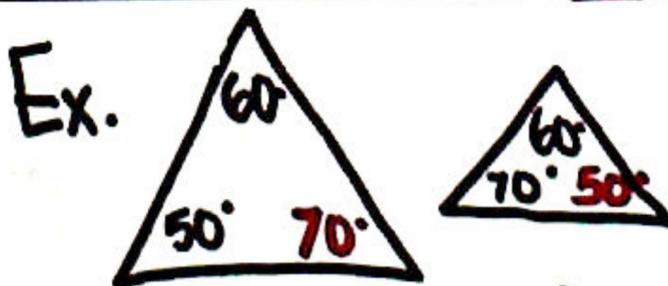
If the two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.



NO, only one pair of  $\angle$ 's are  $\cong$

Are these two triangles similar?

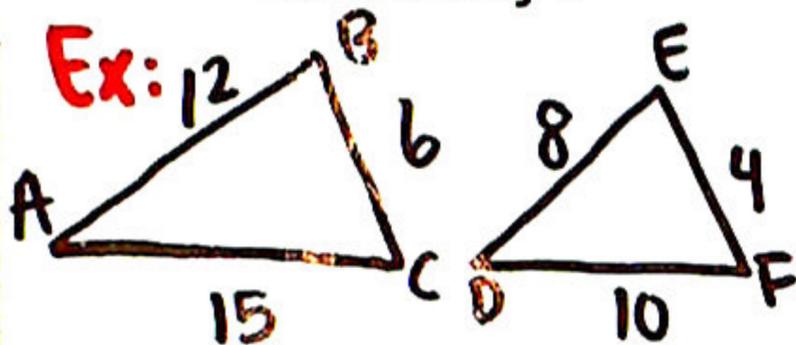
Summary



Yes, at least two pairs of  $\angle$ 's are  $\cong$

# Triangle Similarity & Congruence 7.5 & 7.6 (Similar Triangles)

What is Side Side Side Similarity?



$$\frac{12}{8} = \frac{6}{4} = \frac{15}{10}$$

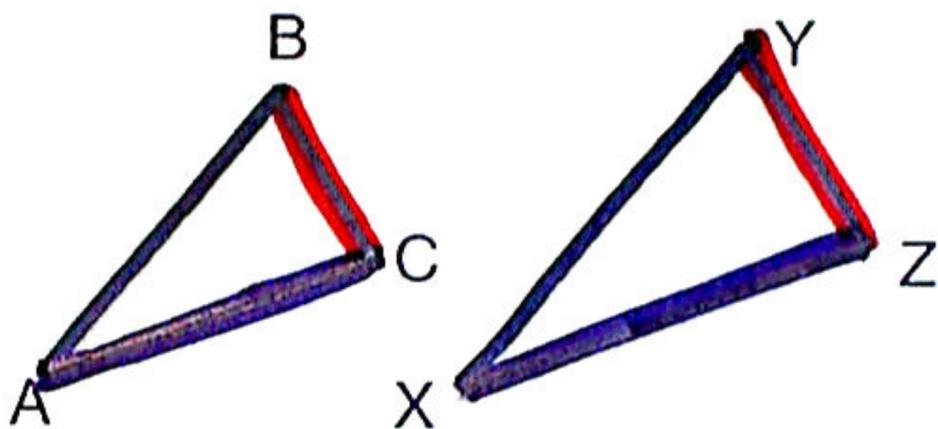
$$\frac{3}{2} = \frac{3}{2} = \frac{3}{2} \checkmark$$

What is Side Angle Side Similarity?

Solution:

- $\angle N \cong \angle R \checkmark$
- $\frac{3}{4} = \frac{6}{8} \leftarrow \text{simplify}$
- $\frac{3}{4} = \frac{3}{4} \checkmark$

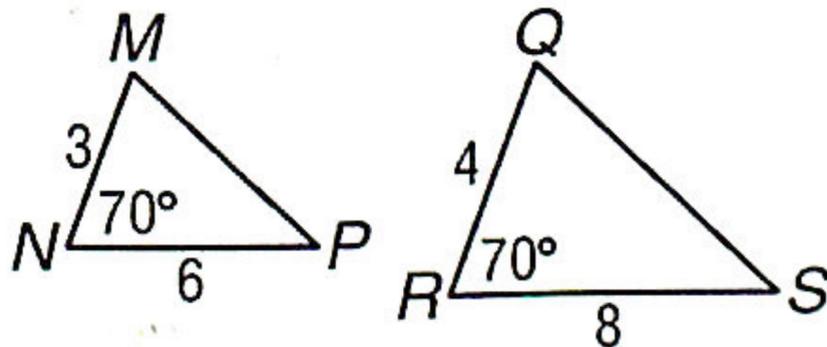
If the measures of the corresponding sides of two triangles are proportional, then the triangles are similar.



$$\frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$$

Yes, they're similar by SSS.  
 $\triangle ABC \sim \triangle DEF$

If the measures of two sides of a triangle are proportional to the measures of two corresponding sides of another triangle and the included angles are congruent, then the triangles are similar.



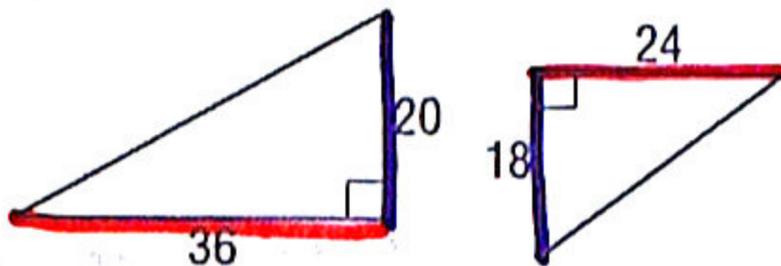
Yes, they're similar by SAS.  
 $\triangle MNP \sim \triangle RQS$

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Ex #1

Are the triangles similar? If so, by what postulate or theorem?

A)



$$2 \div \frac{18}{20} = \frac{24}{36} \div 12$$

\* You can reduce both ratios or cross-multiply.

Reduce ratios:

$$\frac{9}{10} \neq \frac{2}{3}$$

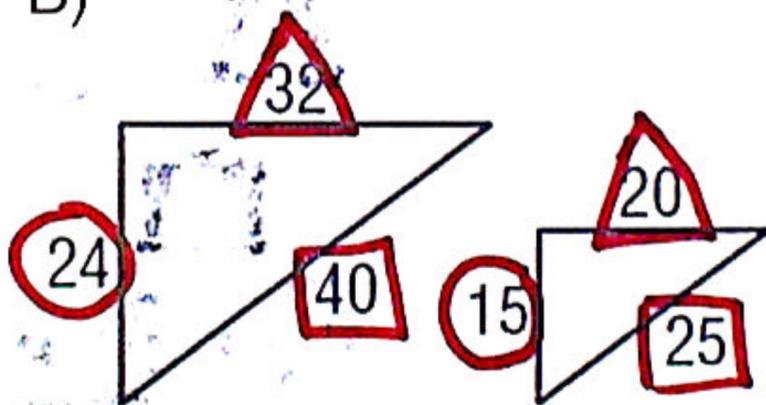
Crossmultiply:

$$18 \cdot 36 = 20 \cdot 24$$

$$648 \neq 480$$

No, they're not similar

B)



$$\frac{24 \div 3}{15 \div 3} = \frac{40 \div 5}{25 \div 5} = \frac{32 \div 4}{20 \div 4}$$

Reduce

$$\frac{8}{5} = \frac{8}{5} = \frac{8}{5} \quad \checkmark$$

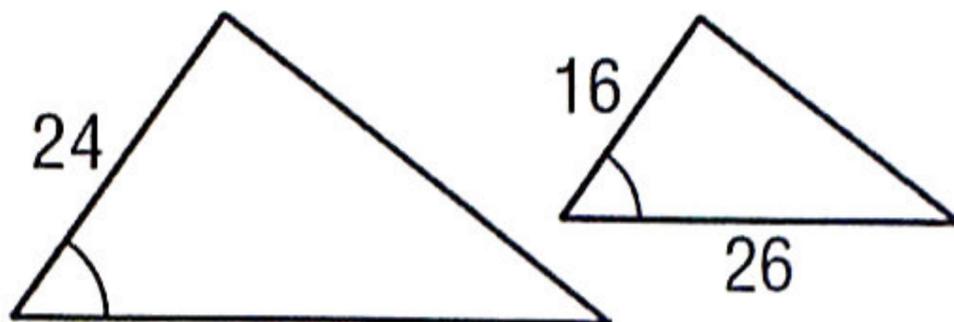
Yes, they're similar by SSS.

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Ex #1  
(Continued)

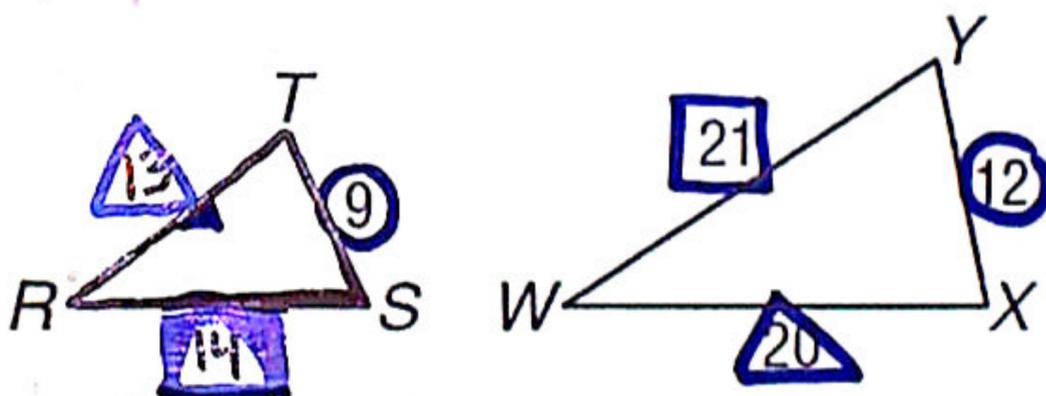
Are the triangles similar? If so, by what postulate or theorem?

C)



\* one congruent angle ✓  
 \*  $\frac{24 \div 8}{16 \div 8} = \frac{39 \div 13}{26 \div 13}$  reduce  $\rightarrow \frac{3}{2} = \frac{3}{2}$   
 Yes, by SAS.

D)



$$\frac{12}{9} = \frac{21}{14} \neq \frac{20}{13}$$

No, they're not similar.

Ex #2

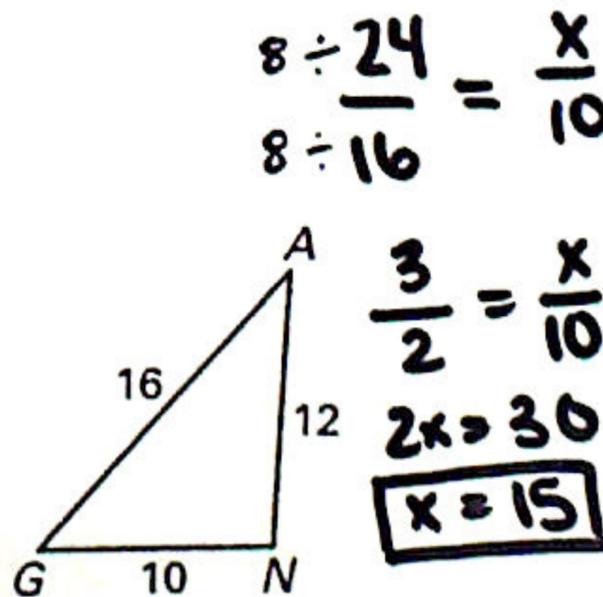
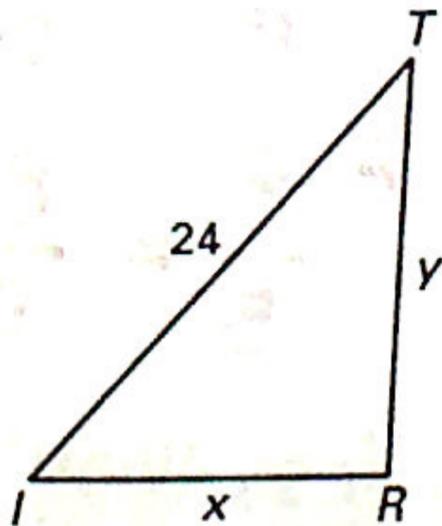
The triangles are similar. Find the value of x and y.

$$\frac{24}{16} = \frac{y}{12}$$

$$\frac{3}{2} = \frac{y}{12}$$

$$2y = 36$$

$$y = 18$$



$$8 \div \frac{24}{8} = \frac{x}{10}$$

$$8 \div 16 = \frac{x}{10}$$

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

$$2x = 30$$

$$x = 15$$