

## Proving Triangles are Similar

Recall, minimum amount of information to prove triangles are similar.

### Angle-Angle Postulate (A.A Post.)

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

Two additional ways to prove triangles are similar.

### Side-Side-Side(SSS) Similarity Theorem

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

### Side-Angle-Side(SAS) Similarity Theorem

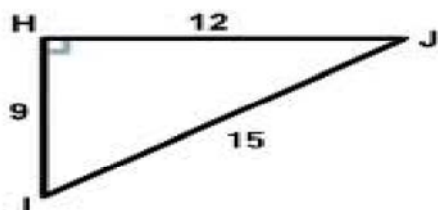
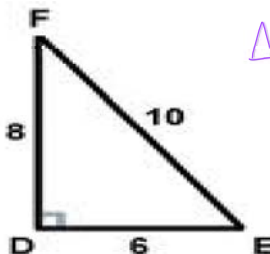
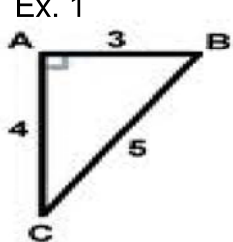
If an angle of one triangle is congruent to an angle of a second triangle and the lengths of the sides including these angles are proportional, then the two triangles are similar.

## Using the SSS and SAS Similarity Theorems

Which of the following triangles are similar?

State the similarity and the postulate or theorem that justifies your answer.

Ex. 1



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

SSS ~ Thm. because all  
corr. sides have  
= ratios

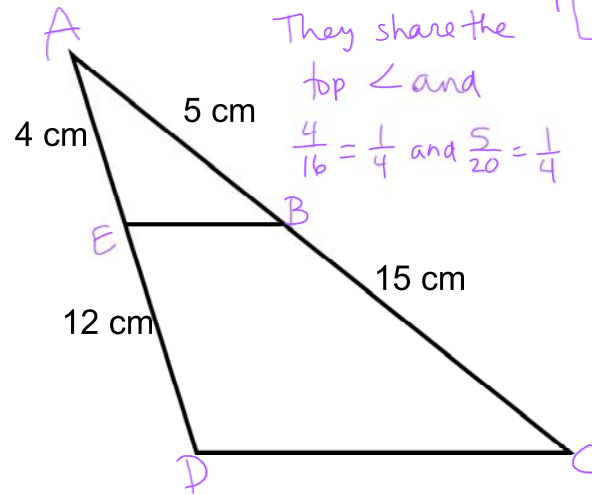
(could be SAS ~ Thm also because  
the two sides + the right  $\angle$ )

## Using the SSS and SAS Similarity Theorems

Are the following triangles ~~are~~ similar?

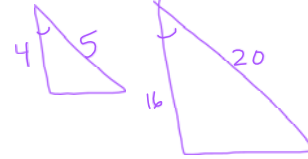
State the similarity and the postulate or theorem that justifies your answer.

Ex 2



They share the top  $\angle$  and

$$\frac{4}{16} = \frac{1}{4} \text{ and } \frac{5}{20} = \frac{1}{4}$$

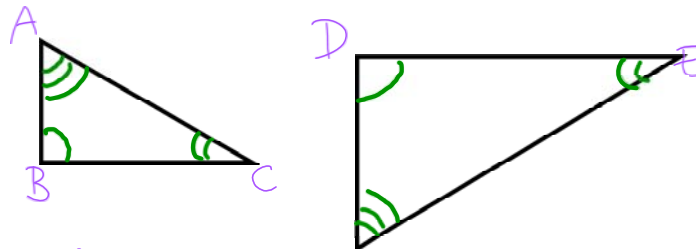


$\triangle ABE \sim \triangle ACD$   
By SAS  $\sim$  Thm.

Are the following triangles ~~are~~ similar?

State the similarity and the postulate or theorem that justifies your answer.

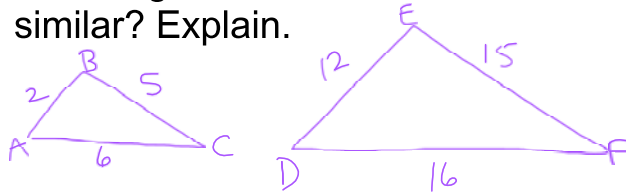
Ex 3



Yes,  $\triangle ABC \sim \triangle FDE$   
by AA  $\sim$  Post.

Ex. 4

The side lengths  $\triangle ABC$  are 2m, 5m, and 6m, and  $\triangle DEF$  has side lengths of 12m, 15m, and 16m. Are the two triangles similar? Explain.



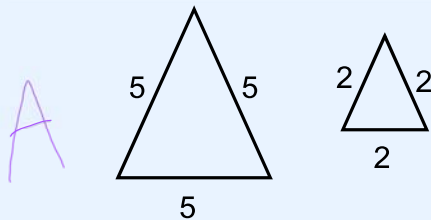
$$\frac{2}{12} = \frac{1}{6} \text{ but } \frac{5}{12} \neq \frac{1}{6} \text{ and } \frac{6}{16} = \frac{3}{8} \neq \frac{1}{6}$$

No because no corr. sides have the same ratios.



Are these triangles similar? Answer yes or no. If yes, state the postulate or theorem that can be used to prove the triangles are similar.

Multiple choice

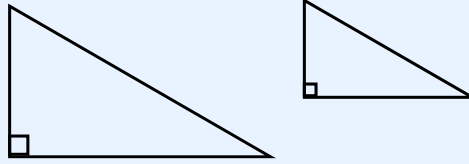


- A Yes, SSS Similarity Theorem
- B Yes, SAS Similarity Theorem
- C Yes, A.A. Postulate
- D No

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Are these triangles similar? Answer yes or no. If yes, state the postulate or theorem that can be used to prove the triangles are similar.

Multiple choice



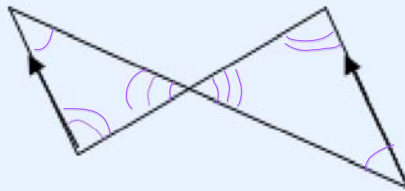
D

- A Yes, SSS Similiarity Theorem
- B Yes, SAS Similiarity Theorem
- C Yes, A.A. Postulate
- D No *not enough info*

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Are these triangles similar? Answer yes or no. If yes, state the postulate or theorem that can be used to prove the triangles are similar.

Multiple choice



C

- A Yes, SSS Similiarity Theorem
- B Yes, SAS Similiarity Theorem
- C Yes, A.A. Postulate
- D No