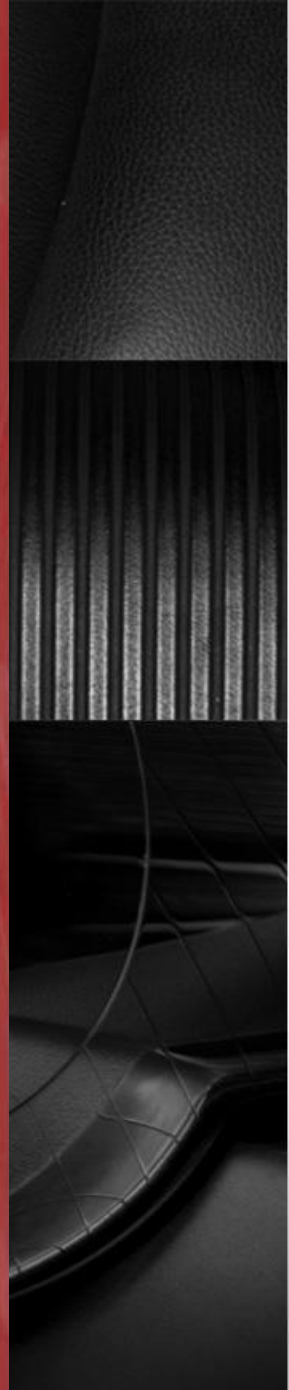


Geometry Unit 7

7-4 and 7-5: Postulates and Theorems for Similar Triangles.





Warm-up

- F. A. Unit 7



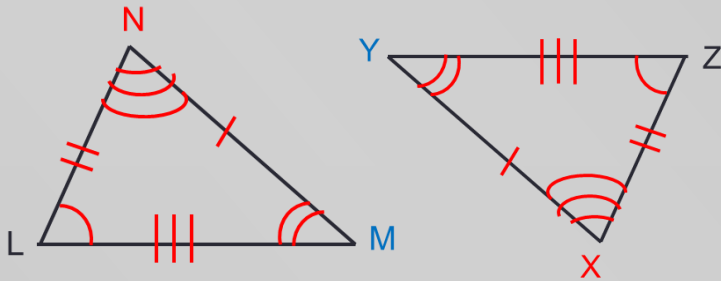
Postulates and Theorems for Similar Triangles

- **Content Objective:** Students will be able to prove that two triangles are similar using postulates and theorems.
- **Language Objective:** Students will be able to write similarity statements using the AA postulate, as well as the SSS and SAS theorems.

Postulates and Theorems for Similar Triangles

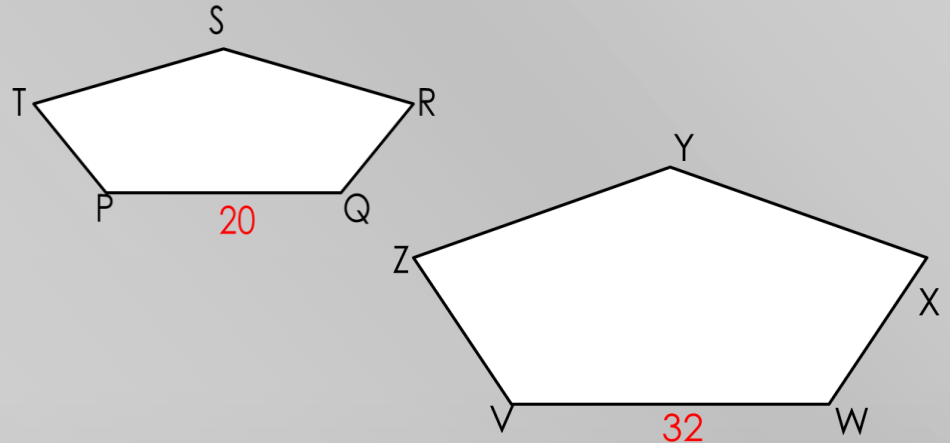
■ Congruent

- Corresponding Angles are \cong
- Corresponding Sides are \cong
- Same Shape and Size



■ Similarity

- Corresponding Angles are \cong
- Corresponding Sides are Proportional
- Same Shape...but not necessarily same Size



In short, all Congruent figures are always Similar...
But Similar figures are not always Congruent.



Much like Congruence, Similarity between two triangles must also be proven...

And we do it using the following postulate and theorems.

A Postulate for Similar Triangles

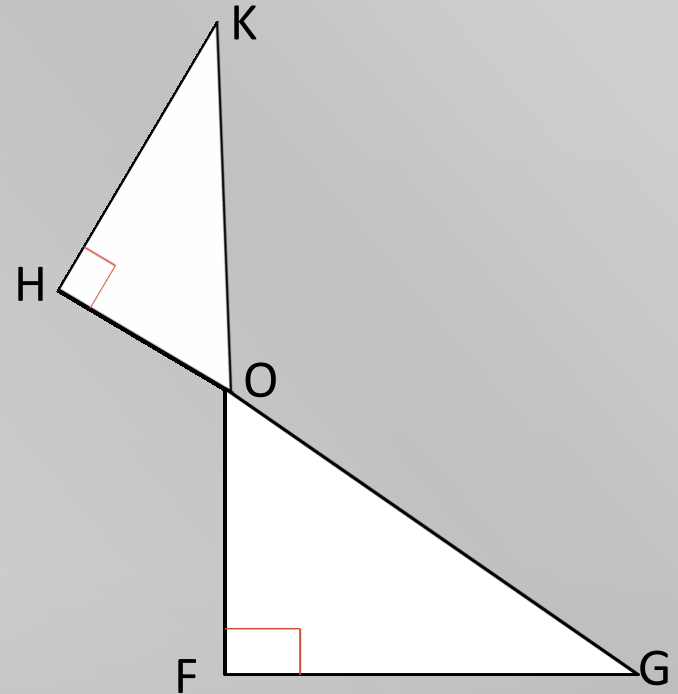
- **AA Similarity Postulate:** If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

Example:

$$\angle H \cong \angle F \quad (\text{Why?})$$

$$\angle HOK \cong \angle FOG \quad (\text{Why?})$$

Thus $\triangle HOK \sim \triangle FOG$
by the **AA Similarity** Postulate



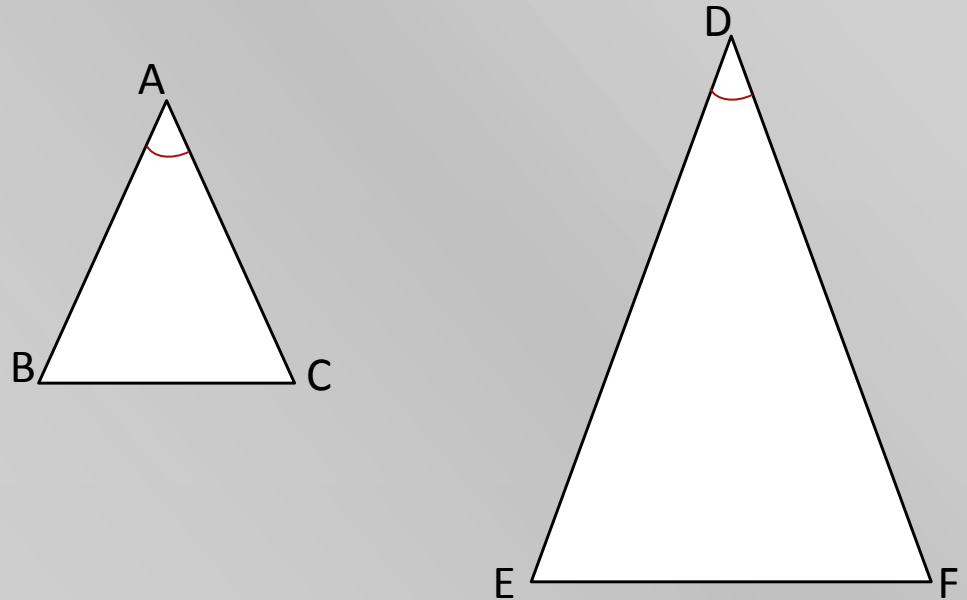
Theorems for Similar Triangles

- **Theorem 7-1 SAS Similarity Theorem:** If an angle of one triangle is congruent to an angle of another triangle and the sides including those angles are in proportion, then the triangles are similar.

Given: $\angle A \cong \angle D$

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

Then: $\triangle ABC \sim \triangle DEF$

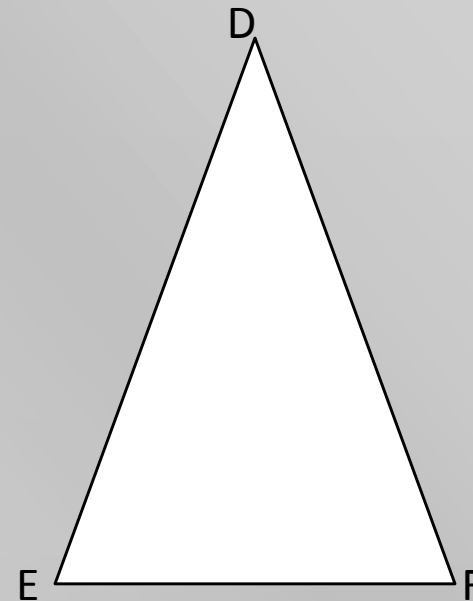
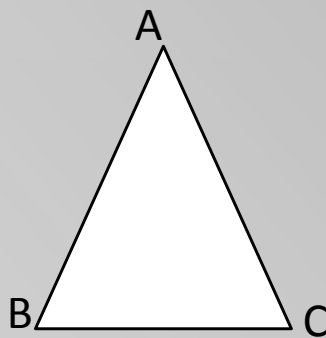


Theorems for Similar Triangles

- **Theorem 7-2 SSS Similarity Theorem:** If the sides of two triangles are in proportion, then the triangles are similar.

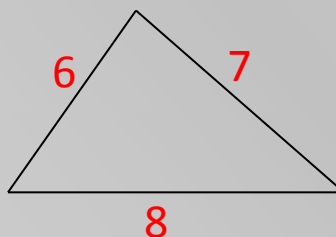
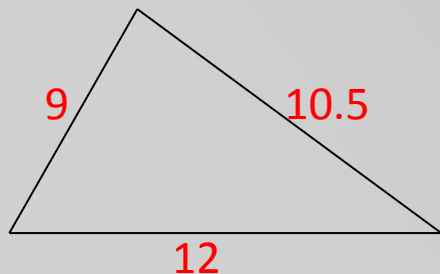
Given: $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

Then: $\triangle ABC \sim \triangle DEF$



Practice using the Postulates and Theorems

- Can the two triangles given be proven similar? If so, state the similarity and tell which similarity postulate or theorem you would use.

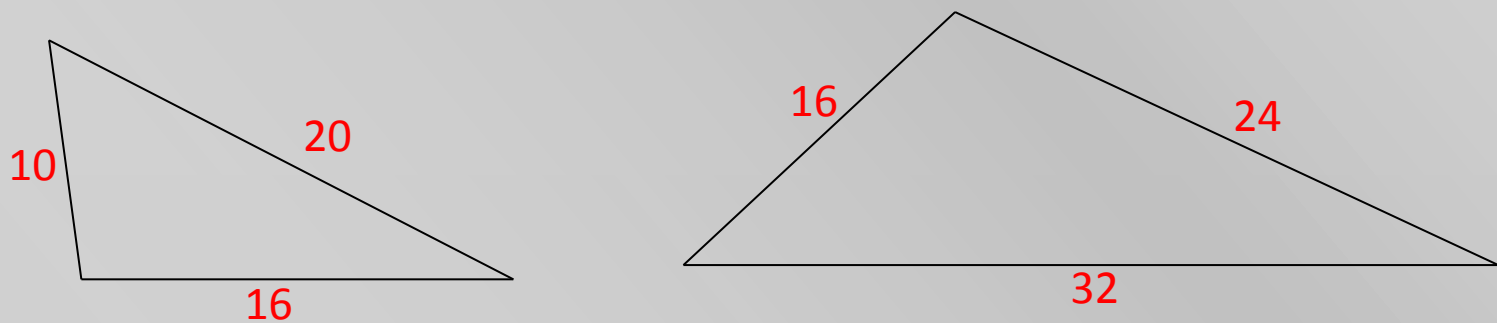


These triangles are congruent by the SSS Similarity Theorem because

The sides of the triangles are in proportion.

Practice using the Postulates and Theorems

- Can the two triangles given be proven similar? If so, state the similarity and tell which similarity postulate or theorem you would use.

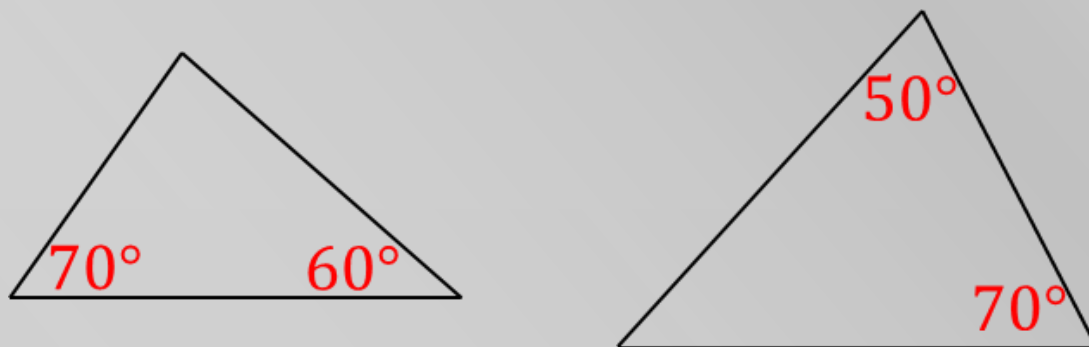


The triangles are **NOT** similar because

The sides of the triangles are **NOT** in proportion.

Practice using the Postulates and Theorems

- Can the two triangles given be proven similar? If so, state the similarity and tell which similarity postulate or theorem you would use.

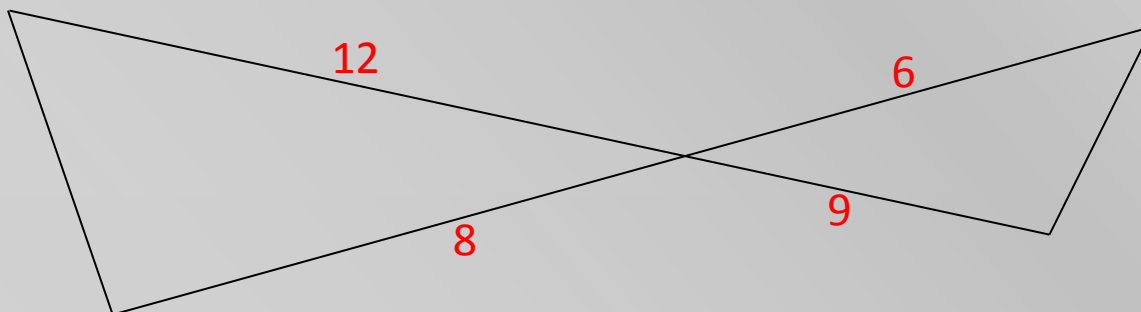


These triangles are congruent by the AA Similarity
Postulate because

2 Angles of the 1st triangle are congruent to
2 Angles of the 2nd triangle.

Practice using the Postulates and Theorems

- Can the two triangles given be proven similar? If so, state the similarity and tell which similarity postulate or theorem you would use.

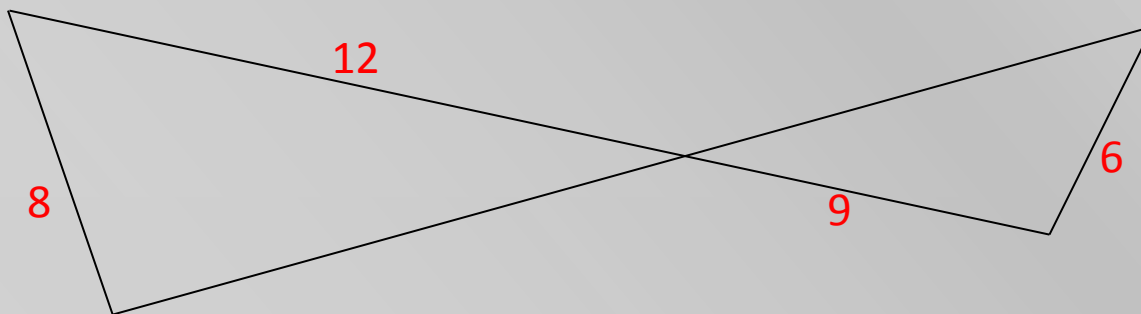


These triangles are congruent by the **SAS Similarity Theorem** because

The proportional sides are between the congruent angles.

Practice using the Postulates and Theorems

- Can the two triangles given be proven similar? If so, state the similarity and tell which similarity postulate or theorem you would use.

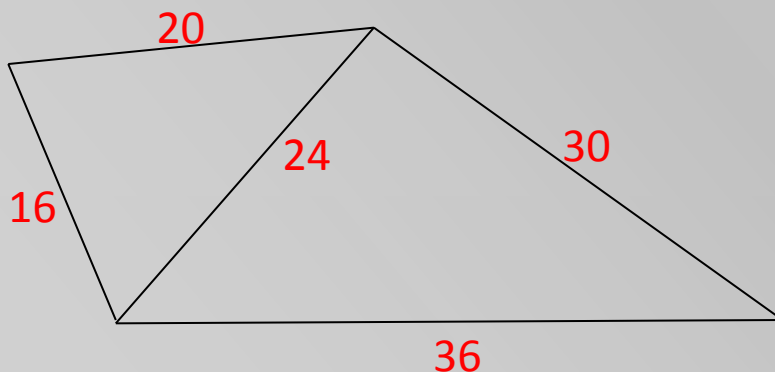


The triangles are **NOT** similar because

The proportional sides are not between the congruent angles.

Practice using the Postulates and Theorems

- Can the two triangles given be proven similar? If so, state the similarity and tell which similarity postulate or theorem you would use.



These triangles are congruent by the SSS Similarity
Theorem because

The sides of the triangles are in proportion.