Proving Similar Triangles 7.3



Remember...

Similar triangles have the same shape but not necessarily the same size.



In similar triangles...

Angles are congruent, and sides are proportional.

 $\angle A \cong \angle D$ $\angle B \cong \angle E$ $\angle C \cong \angle F$



Proving Similar Triangles

There are three ways to prove triangles are similar.

- 1. SSS Similarity Theorem
 - ➔ 3 pairs of proportional sides
- 2. SAS Similarity Theorem
 - → 2 pairs of proportional sides and congruent angles between them
- 3. AA Similarity Theorem
 - ➔ 2 pairs of congruent angles







2 Proportional Sides $\frac{5}{7.5} = \frac{7}{10.5} = .6$

Included Angle: $m\angle H = m\angle K$ **70**°

Κ





Think About It? Are the two triangles similar?





$\Delta TSU \sim \Delta XZY$ by AA~

m∠S =

34 + 87 = 121 $180 - 121 = 59^{\circ}$



Examples

Is it possible to prove the two triangles similar? If so, state the reason and write a similarity statement. If not, explain why not.



Abore Examples

3) A building casts a shadow that is 50 feet long. A flagpole that is 40 feet high casts a shadow that is 6 feet long. How tall is the building to the nearest foot?



You Try!

Are the following triangles similar? If so name the postulate or theorem you used. (TIP: Separate and draw the triangles.)



- 2 Proportional Sides $\frac{20}{44} = \frac{25}{55} = .45$ 1 pair of \cong
 - Included $\angle s$

Yes, the riangless are \sim by SAS \sim .



Proof

Given: AB//CD, BC //DG

Prove: $\triangle ABC \sim \triangle CDG$



