

Name:

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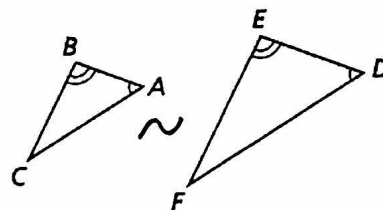
Period: |

Proving Triangles Similar using Angle-Angle Similarity

Lesson Objective INBAT prove 2 Δ s are $\sim$ by AA $\sim$;
 apply AA $\sim$ in Δ s

Angle-Angle Similarity Theorem (AA $\sim$)

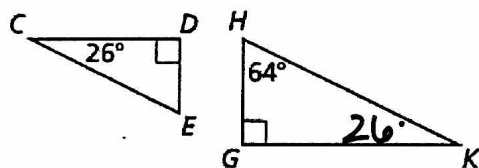
If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.



$$\angle A \cong \angle D \text{ and } \angle B \cong \angle E \rightarrow \triangle ABC \sim \triangle DEF$$

Example:

1. Determine whether the triangles are similar. If they are, briefly explain your reasoning. Then write a similarity statement.

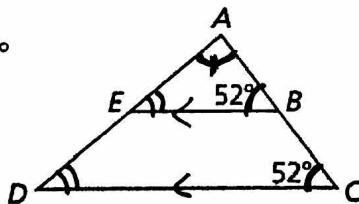


$$\left. \begin{array}{l} \angle D \cong \angle G \\ \angle C \cong \angle K \end{array} \right\} \triangle CDE \sim \triangle KHG \text{ by AA} \sim$$

2. Write a two-column proof.

Given: $m\angle ABE = 52^\circ$ and $m\angle ACD = 52^\circ$

Prove: $\triangle ABE \sim \triangle ACD$

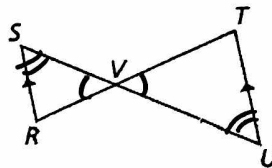


Statements	Reasons
① $m\angle ABE = 52$ and $m\angle ACD = 52$	① given
② $m\angle ABE = m\angle ACD$	② trans. prop. =
③ $\angle ABE \cong \angle ACD$	③ $= \leftrightarrow \cong$
④ $\angle A \cong \angle A$	④ reflex. prop $\cong$
⑤ $\triangle ABE \sim \triangle ACD$	⑤ AA $\sim$

3. Write a two-column proof.

Given: $\overline{SR} \parallel \overline{UT}$

Prove: $\triangle SVR \sim \triangle UVT$



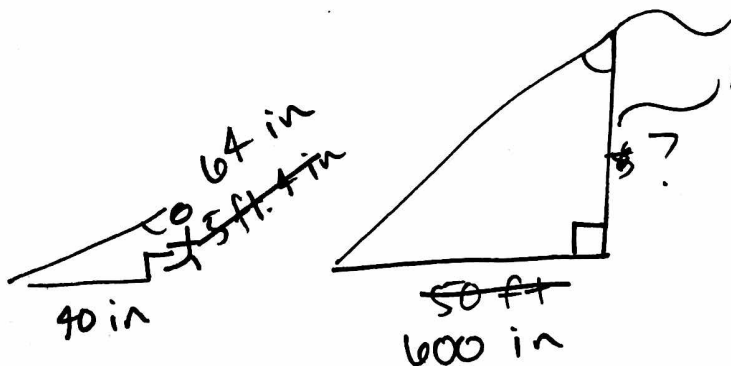
Statements	Reasons
① $\overline{SR} \parallel \overline{UT}$	① given
② $\angle SVR \cong \angle UVT$ $\angle V \cong \angle V$	② vert. $\angle$ s $\cong$
③ $\angle S \cong \angle U$	③ $\parallel \rightarrow$ alt. int. $\angle$ s $\cong$
④ $\triangle SVR \sim \triangle UVT$	④ AA $\sim$

4. A flagpole casts a shadow that is 50 ft long. At the same time, a woman standing nearby who is 5 feet 4 inches tall casts a shadow that is 40 inches long. How tall is the flagpole to the nearest foot? Draw a diagram of the scenario.

$$\frac{64}{x} = \frac{140}{1560}$$

$$x = 960 \text{ in}$$

$$x = \boxed{80 \text{ ft}}$$



5. What if a child who is 58 inches tall is standing next to the woman in example #4? How long is the child's shadow?

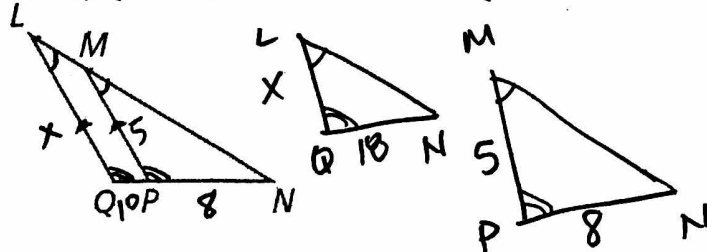
$$\frac{58}{x} = \frac{64}{40}$$

$$\frac{58}{64} = \frac{x}{40}$$

$$x = 36.25$$

$$\boxed{36.25 \text{ in}}$$

6. $PN = 8$, $QP = 10$, and $MP = 5$. Find LQ .



$$\frac{5}{x} = \frac{8}{18}$$

$$x = 11.25$$

$$\boxed{LQ = 11.25}$$