Name: **Date:** **Period:** 5

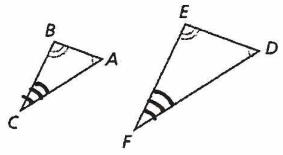
Proving Triangles Similar by AA

Lesson Objective: WHAT prove 2 Δs are ~ by AA~

Just like proving triangles ≅, there are ways to prove triangles ~.

Theorem 8.3 Angle-Angle Similarity Theorem (AA~)

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

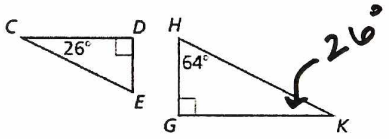


☆ ∠C ≅ ∠F by 3rd Ls Thm

so, all corresp. Ls ≅ → ~

Examples:

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

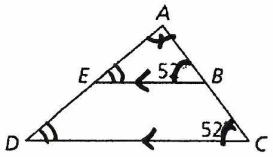


∠D ≅ ∠G

∠C ≅ ∠K

ΔCDE ~ ΔKGH by AA~

2. Write a two-column proof.
Given: $m\angle ABE = 52°$ and $m\angle ACD = 52°$
Prove: $\Delta ABE \sim \Delta ACD$



Statements	Reasons
① $m\angle ABE = 52°$, $m\angle ACD = 52°$	① given
② $m\angle ABE = m\angle ACD$	② Trans. prop. =
③ $\angle ABE \cong \angle ACD$	③ = → ≅
④ $\angle A \cong \angle A$	④ reflex. prop. ≅
⑤ $\Delta ABE \sim \Delta ACD$	⑤ AA~

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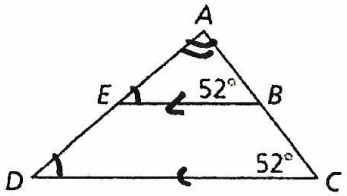

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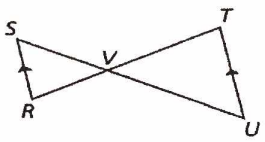
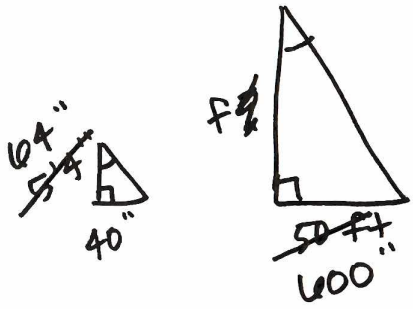
⑤ $\Delta ABE \sim \Delta ACD$	⑤ AA ~

3. Write a two-column proof.
Given: $\overline{SR} \parallel \overline{UT}$
Prove: $\Delta SVR \sim \Delta UVT$



Statements	Reasons
① $\overline{SR} \parallel \overline{UT}$	① given
② $\angle R \cong \angle T$, $\angle S \cong \angle U$	② $\parallel \rightarrow$ alt. int. $\angle$s $\cong$
③ $\Delta SVR \sim \Delta UVT$	③ AA~

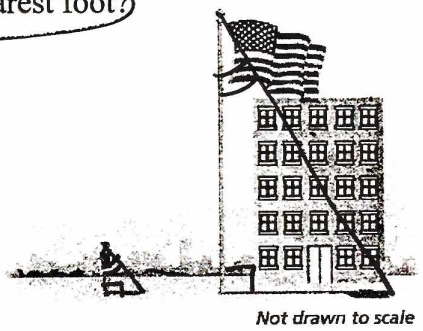
4. A flagpole casts a shadow that is 50 ft long. At the same time, a woman standing nearby who is 5 feet 4 inches tall casts a shadow that is 40 inches long. How tall is the flagpole to the nearest foot?



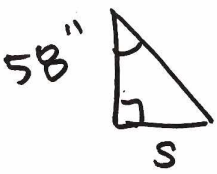
$\frac{64}{f} = \frac{40}{600}$

$f = 960$ in

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


Not drawn to scale

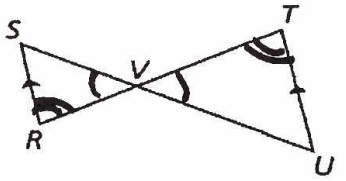
5. What if a child who is 58 inches tall is standing next to the woman in example #4? How long is the child's shadow?



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

$\boxed{s = 36.25 \text{ inches}}$

3. Write a two-column proof.
Given: $\overline{SR} \parallel \overline{UT}$
Prove: $\Delta SVR \sim \Delta UVT$



Statements	Reasons
① $\overline{SR} \parallel \overline{UT}$	① given
② $\angle SVR \cong \angle UVT$	② vert. $\angle$s $\cong$
③ $\angle R \cong \angle T$	③ $\parallel \rightarrow$ alt. int. $\angle$s $\cong$
④ $\Delta SVR \sim \Delta UVT$	④ AA$\sim$