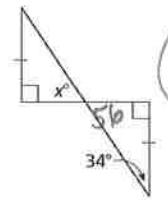
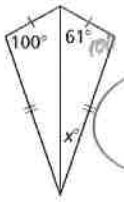
8.2 - AA Similarity

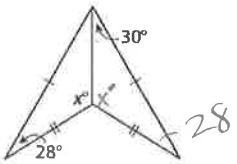
Bellwork - Find the value of x.

1. 

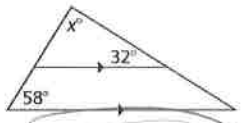
x = 56°

2. 

x = 19°

3. 

122°

4. 

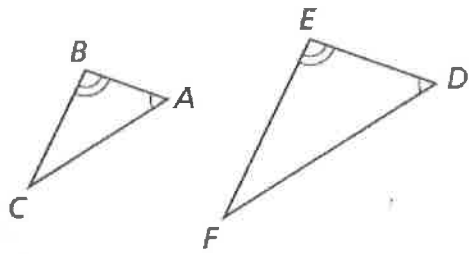
x = 90°

Theorem 8.3 Angle-Angle (AA) Similarity Theorem

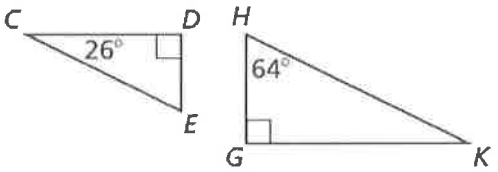
If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.

If $\angle A \cong \angle D$ and $\angle B \cong \angle E$, then $\triangle ABC \sim \triangle DEF$.

Proof p. 428



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



$\angle D \cong \angle G$

$26° + 90° + m\angle E = 180$

$m\angle E = 64°$

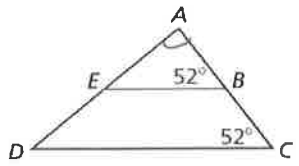
because of Δ Sum Thrm.

So, $\angle E \cong \angle H$

So $\Delta CDE \sim \Delta KGH$

Show that the two triangles are similar.

a. $\triangle ABE \sim \triangle ACD$

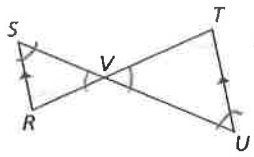


$\angle A \cong \angle A$ by Reflex. POC

$m\angle ABE = m\angle C = 52°$

$\triangle ABE \sim \triangle ACD$, by AA ~ Thrm.

b. $\triangle SVR \sim \triangle UVT$



$\angle S \cong \angle U$, Alt Int. $\angle$'s Thrm.

$\angle SVR \cong \angle UVT$ Vert. $\angle$'s $\cong$ Thrm

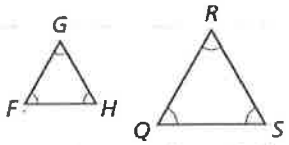
So, $\triangle SVR \sim \triangle UVT$ by $\triangle$ Sim. Thrm.

3. WHAT IF? Suppose that $\overline{SR} \not\parallel \overline{TU}$ in Example 2 part (b). Could the triangles still be similar? Explain.

No, because you can't prove $\angle S \cong \angle U$ or $\angle R \cong \angle T$

Show that the triangles are similar. Write a similarity statement.

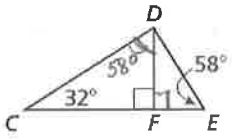
1. $\triangle FGH$ and $\triangle RQS$



$\angle F \cong \angle R$ and $\angle G \cong \angle Q$

So, $\triangle FGH \sim \triangle RQS$ because AA Sim. Thrm.

2. $\triangle CDF$ and $\triangle DEF$



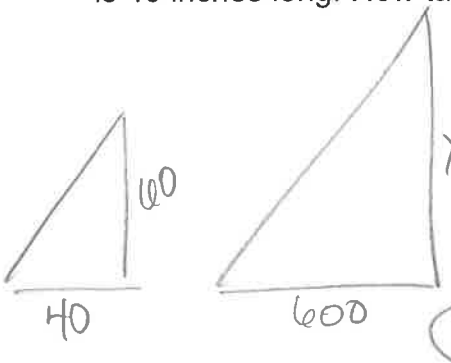
$m\angle CDF + 32 = 90$

$m\angle CDF = 58°$

$\angle CDF \cong \angle DEF$ and $\angle CFE \cong \angle DFE$

So, $\triangle CDF \sim \triangle DEF$

A flagpole casts a shadow that is 50 feet 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?

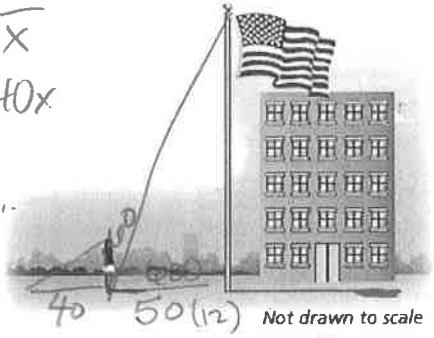


$\frac{40}{600} = \frac{60}{x}$

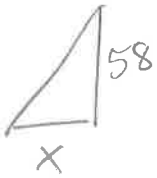
$36{,}000 = 40x$

$x = 900$ in.

75 ft.



4. WHAT IF? A child who is 58 inches tall is standing next to the woman in Example 3. How long is the child's shadow?



$\frac{60}{58} = \frac{40}{x}$

$2320 = 60x$

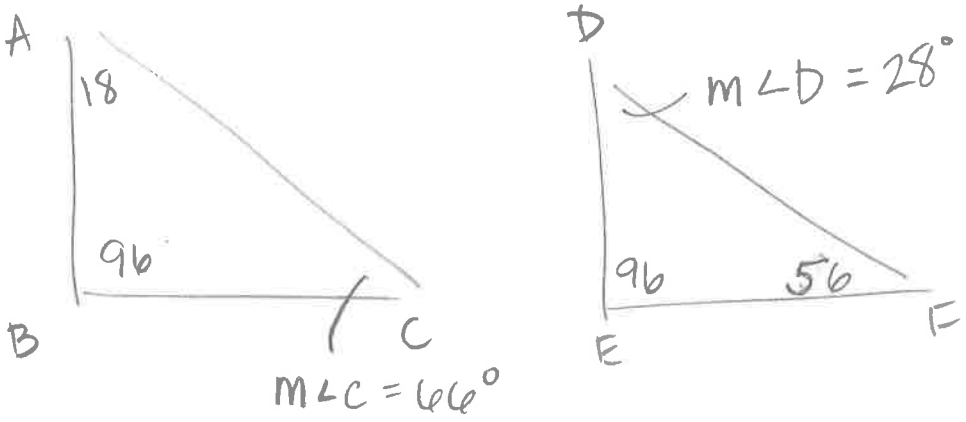
$38\frac{2}{3} = x$

$38\frac{2}{3}$ inches

5. You are standing outside, and you measure the lengths of the shadows cast by both you and a tree. Write a proportion showing how you could find the height of the tree.

Sample, $\frac{\text{my height}}{\text{tree height}} = \frac{\text{my shadow}}{\text{tree shadow}}$

Exit Ticket: One triangle has angles of 18° and 96°, and a second triangle has angles of 56° and 96°. Are the triangles similar? Explain.



The Δ's are not similar because 2 out of the 3 angles are not congruent.

Homework

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