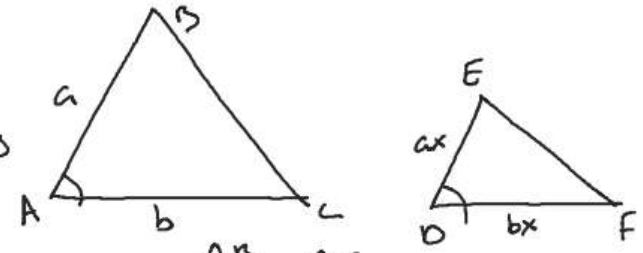
Ways to prove Triangles Similar

Side-Angle-Side (SAS)

2 pairs of corresponding Sides proportional and an included Angle ≅ then Δ are ~

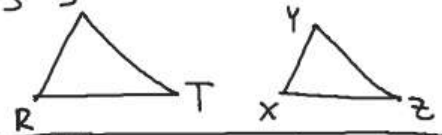


$\frac{AB}{DE} = \frac{AC}{DF}$ $\angle A \cong \angle D$

$\Delta ABC \sim \Delta DEF$ SAS

Side-Side-Side (SSS)

3 pairs of corresponding Sides proportional.

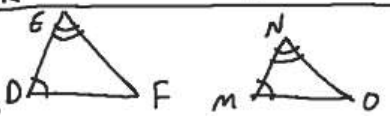


$\frac{RS}{XY} = \frac{ST}{YZ} = \frac{RT}{XZ}$

$\Delta RST \sim \Delta XYZ$ SSS

Angle-Angle (AA)

2 pairs of corresponding Angles ≅.



$\angle D \cong \angle M$

$\angle E \cong \angle N$ AA

$\Delta DEF \sim \Delta MNO$

Proving Triangles Similar

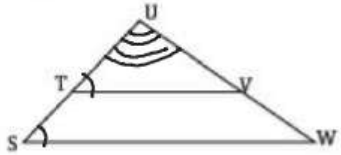
Vertical ∠'s

Reflexive Property
Something is ≅ to itself

$\angle A \cong \angle A$

$\overline{DF} \cong \overline{DF}$

6. Given: $\angle S \cong \angle UTV$



Prove: $\Delta SUW \sim \Delta TUV$

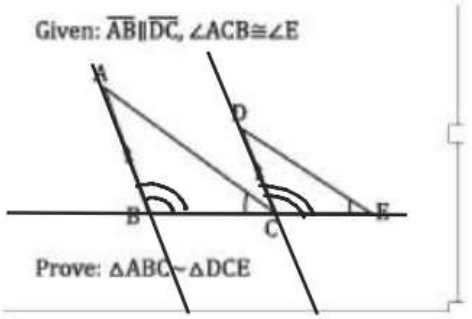
~~SAS~~ AA ~~SSS~~

Statement	Reason
1) $\angle S \cong \angle UTV$	1) Given
2) $\angle U \cong \angle U$	2) Reflexive prop.
3) $\Delta SUW \sim \Delta TUV$	3) AA

~~SSS~~
SAS
AA

7.

Given: $\overline{AB} \parallel \overline{DC}$, $\angle ACB \cong \angle E$

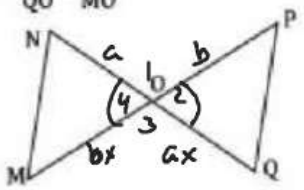


Prove: $\triangle ABC \sim \triangle DCE$

Statement	Reason
1) $\overline{AB} \parallel \overline{DC}$, $\angle ACB \cong \angle E$	1) Given
2) $\angle B \cong \angle DCE$	2) Corresponding $\angle$'s
3) $\triangle ABC \sim \triangle DCE$	3) AA

8.

Given: $\frac{NO}{QO} = \frac{PO}{MO}$



Prove: $\triangle MNO \sim \triangle PQO$

SAS
~~SSS~~

Statement	Reason
1) $\frac{NO}{QO} = \frac{PO}{MO}$	1) Given
2) $\angle 2 \cong \angle 4$	2) Vertical $\angle$'s $\cong$
3) $\triangle MNO \sim \triangle PQO$	3) SAS

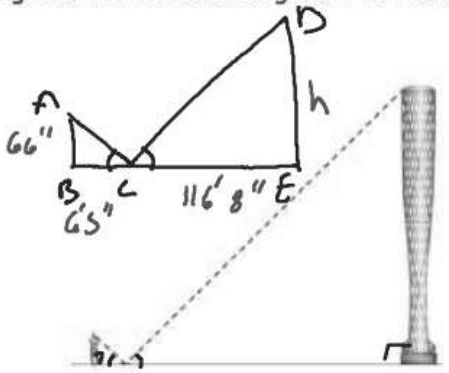
Using Similarity to Find Measure

66"

6'5" = 77"

116' 8" = 1400"

Suppose a mirror is placed on the ground as shown. You position yourself to see the top of the sculpture reflected in the mirror. An important property of physics states that in such a case, the angle of incidence is congruent to the angle of reflection.



9. Prove that the two triangles are similar. $\triangle ABC \sim \triangle DEC$

Statement	Reason
1) $\angle ACB \cong \angle DCE$	1) Given
2) $\angle B \cong \angle E$	2) All Rt $\angle$'s $\cong$
3) $\triangle ABC \sim \triangle DEC$	3) AA

10. Add to your diagram the following measurements.
    - The ground distance between you and the mirror image of the top of the column is 6 feet 5 inches.
    - The ground distance between the mirror image and the base of the column is 116 feet 8 inches.
    - Assume that the distance from the ground up to your eyes is 66 inches.

About how tall is the column?

$\frac{66}{h} = \frac{77}{1400}$

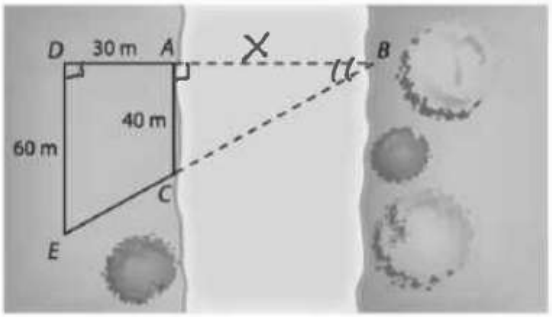
$77h = 92{,}400$

$h = 1200''$

$h = 100'$

11. As part of their annual October outing to study the changing colors of trees in northern Maine, several scinece club members from Pland Regional High School decided to test what they were learning in their math class by finding the width of the Penobscot River at a particular point A as shown below.

Pacing from point A, they located points D, E, and C as shown in the diagram below.



What is your estimate of the width of the river at point A?

6
20
45
60