Suppose that you have $\Delta TRA\ and\ \Delta SED$, and $\frac{TR}{SE} = \frac{AT}{DS}$. Identify the criterion that proves that the two triangles are similar given each additional statement.

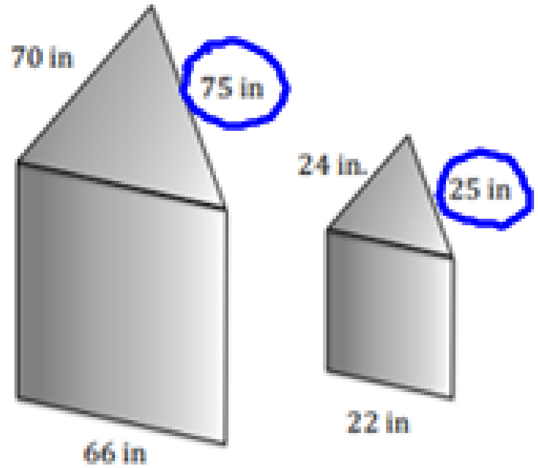
$\angle R \cong \angle E$

SAS~

$\frac{TR}{SE} = \frac{RA}{ED}$

SSS~

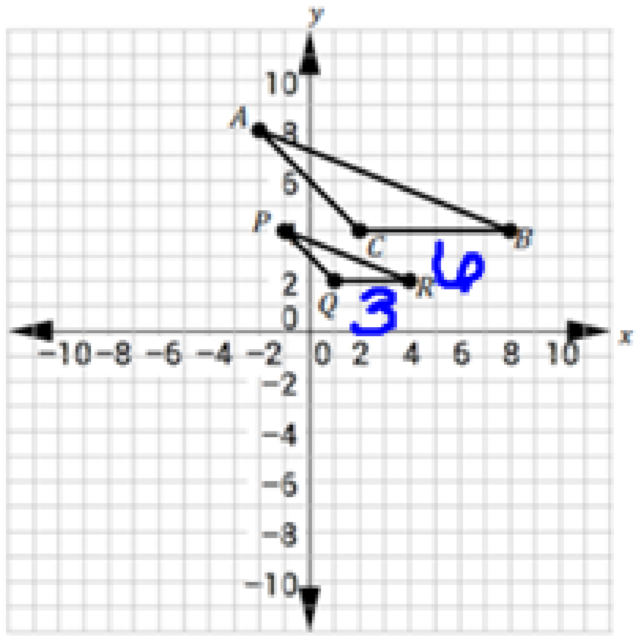
1. An artist is designing a sculpture for the town square that will contain two triangular solids. The artist wants the triangles in the bases of each solid to be similar.



a. Are the triangles similar? Justify your answer.

$\frac{75}{25} = 3 \quad \frac{70}{24} = 2.9$ Not $\sim$

b. If the triangles are not similar, what measurement(s) could be changed to make them similar? Justify your answer. 70 to 72 $\quad \frac{72}{24} = 3$



2 times bigger

2.

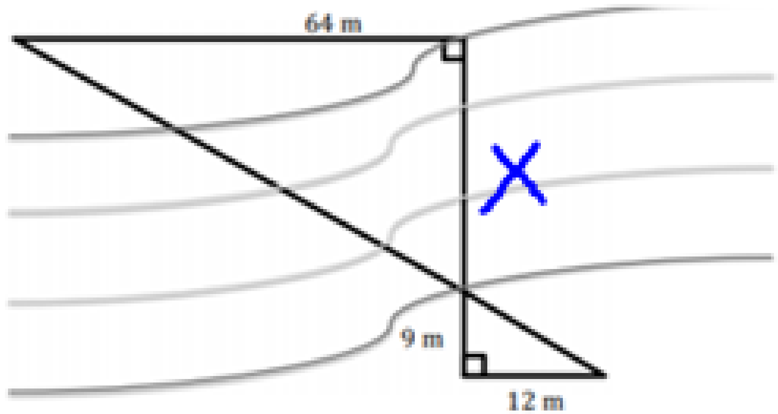
Prove $\Delta ACB \sim \Delta PQR$ by applying properties of transformations. Justify your steps.

P(−1, 4) A(−2, 8)

×2 ×2

(−2, 8) (x, y) → (2x, 2y)

3. A surveyor is measuring the width of a river for a future bridge.



a. What similarity criterion can be used to prove that the triangles are similar?

SAS~ or AA~

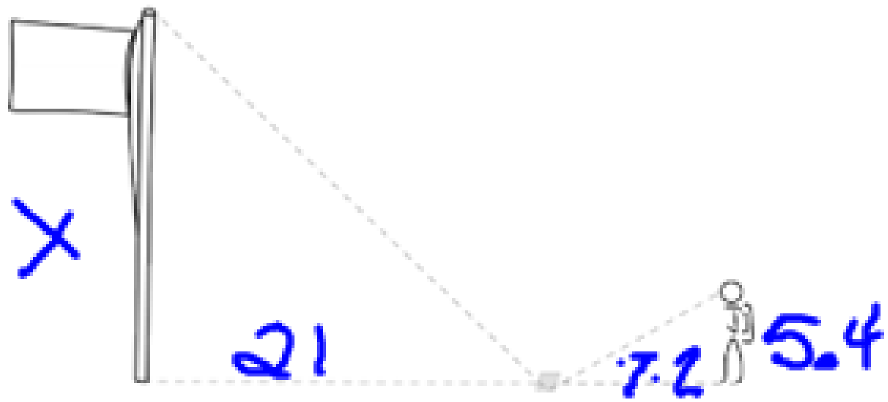
b. Use the properties of similar triangles to set up a proportion and determine the width of the river.

$$\frac{x}{9} = \frac{64}{12}$$

$12x = 576$

$x = 48m$

4. Mrs. Robinson assigned her class a project to find the height of the flagpole. The students could not easily measure the height, so they had to use their knowledge of similar triangles to determine the height of the flagpole. One student placed a mirror on the ground 21 feet from the base of the flagpole and backed up until the reflection of the top of the pole was centered in the mirror.



Part A: If the student is 5.4 feet tall and is standing 7.2 feet from the mirror, how tall is the flagpole?

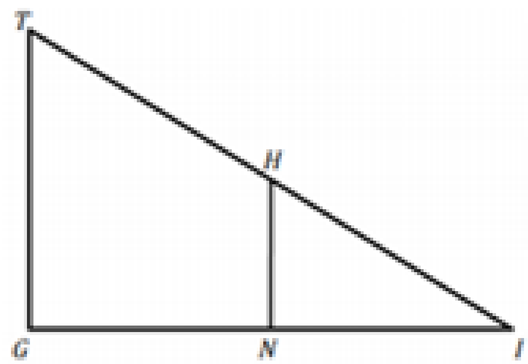
$$\frac{21}{7.2} = 2.9167(5.4) = 15.8\text{ ft}$$

Part B: Describe another way to use similarity of triangles to find the height of the flagpole.

$$\frac{x}{5.4} = \frac{21}{7.2}$$

Your turn:

Which of the following could be used to prove that ΔHIN *and* ΔTIG are similar? Select all that apply.

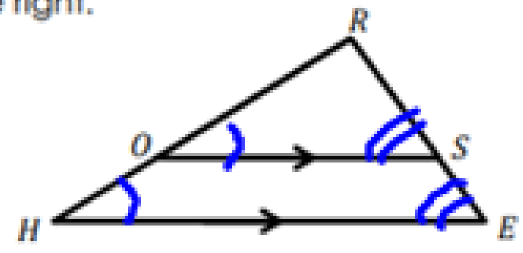


- ☐ N is the midpoint of $\overline{GI}$
- ☐ $\overline{TG} \parallel \overline{HN}$
- ☐ $\angle T \cong \angle I$
- ☐ $\overline{TG} \perp \overline{IG}$
- ☐ $\overline{HN}$ bisects $\overline{IG}$ and $\overline{TI}$
- ☐ ΔTIG is dilated by a scale factor less than 1 centered at point I.

Consider the diagram to the right.

Given: $\overline{OS} \parallel \overline{HE}$

Prove: $\frac{OH}{OR} = \frac{SE}{RS}$



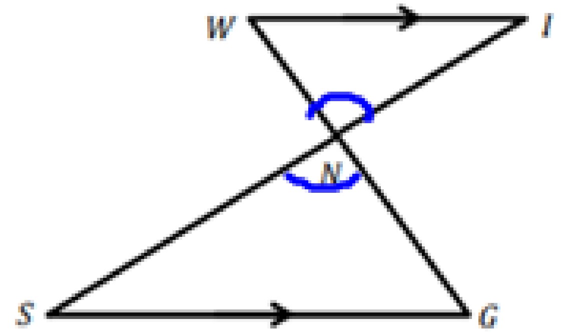
Complete the following two-column proof.

Statements	Reasons
1. $\overline{OS} \parallel \overline{HE}$	1. Given
2. $\angle ROS \cong \angle H$, $\angle RSO \cong \angle E$	2. Corr $\angle$'s
3. $\triangle ROS \sim \triangle RHE$	3. AA Similarity Criterion
4. $\frac{HR}{OR} = \frac{RE}{RS}$	4. Def of $\sim$ $\triangle$'s
5. $\frac{OR+HO}{OR} = \frac{RS+SE}{RS}$	5. Segment Addition Postulate
6. $\frac{OR}{OR} + \frac{HO}{OR} = \frac{RS}{RS} + \frac{SE}{RS}$	6. Substitution
7. $1 + \frac{HO}{OR} = 1 + \frac{SE}{RS}$	7. Substitution
8. $\frac{OH}{OR} = \frac{SE}{RS}$	8. Subtraction Property of Equality

2. Consider the diagram to the right.

Given: $\overline{WI} \parallel \overline{SG}$

Prove: $\frac{WN}{NG} = \frac{WI}{SG}$



Complete the following two-column proof.

Statements	Reasons
1. $\overline{WI} \parallel \overline{SG}$	1. Given
2. $\angle WNI \cong \angle GNS$	2. Vertical <'s
3. <G ≅ <W	3. Alternate Interior Angles Theorem
4. ΔWNI ~ ΔGNS	4. AA~ Criterion
5. $\frac{WN}{NG} = \frac{WI}{SG}$	5. Def of ~ Δ's