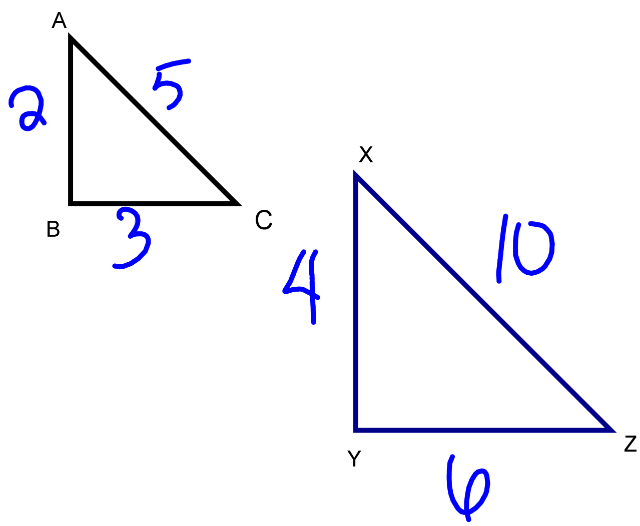
Properties of Similar Triangles

Similar Triangles:

If $\triangle ABC \sim \triangle XYZ$ and the scale factor is $n = \dfrac{AB}{XY}$ then:

- the length of any side or altitude of

  $\triangle ABC = n$(length of corresponding side or altitude of $\triangle XYZ$)



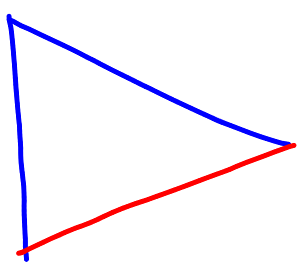
$n = \dfrac{XY}{AB} = \dfrac{4}{2} = 2$

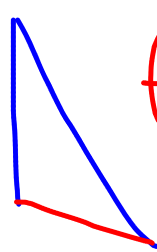
$n = \dfrac{XZ}{AC} = \dfrac{10}{5} = 2$

$n = \dfrac{YZ}{BC} = \dfrac{6}{3} = 2$

MUST TEST

ALL 3

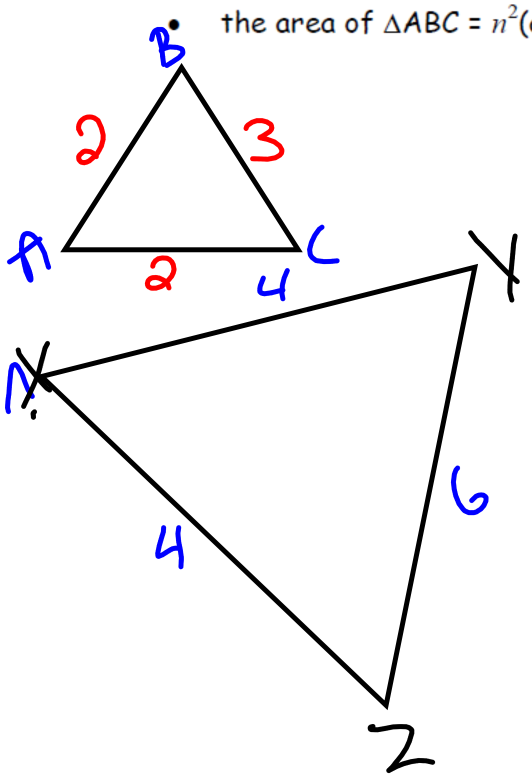




Properties of Similar Triangles

If $\triangle ABC \sim \triangle XYZ$ and the scale factor is $n = \frac{AB}{XY}$ then:

- the perimeter of $\triangle ABC$ = n(perimeter of $\triangle XYZ$)
- the area of $\triangle ABC$ = n^2(area of $\triangle XYZ$)



Scale Factor is 2 for $\triangle ABC \sim \triangle XYZ$

$P_{\triangle ABC} = 2+3+2 = 7$

$P_{\triangle XYZ} = 4+6+4 = 14$

$2P_{\triangle ABC} = P_{\triangle XYZ}$

OR

$P_{\triangle ABC} = \frac{1}{2} P_{\triangle XYZ}$

$2x = y$

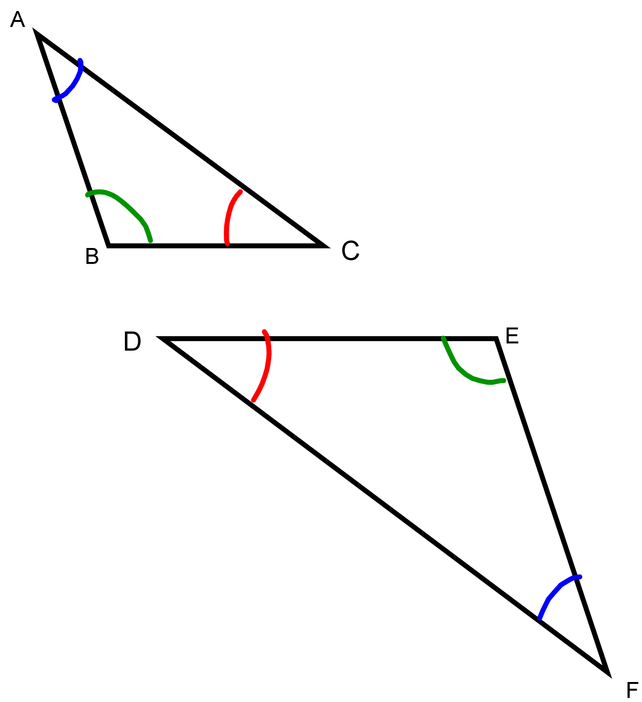
$x = \frac{y}{2}$

$x = \frac{1}{2}y$

Properties of Similar Triangles

To prove that 2 triangles are similar.

- Angle-Angle Similarity (AA~) -- Two corresponding pairs of angles share the same measure.



$\angle B = 110^\circ$

$\angle C = 36^\circ$

$\angle E = 110^\circ$

$\angle D = 36^\circ$

$\therefore \angle B = \angle E$

and $\angle C = \angle D$

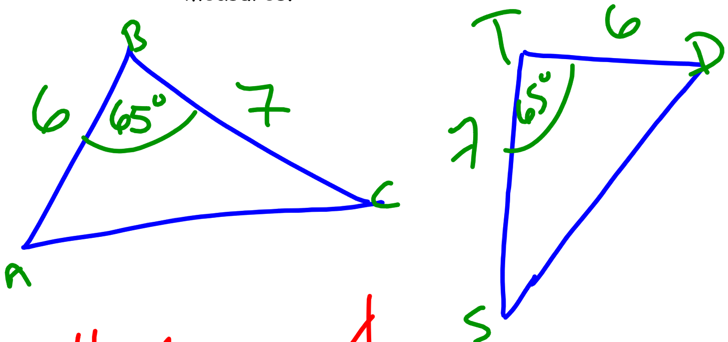
$\Delta ABC \sim \Delta XYZ$

Properties of Congruent Triangles

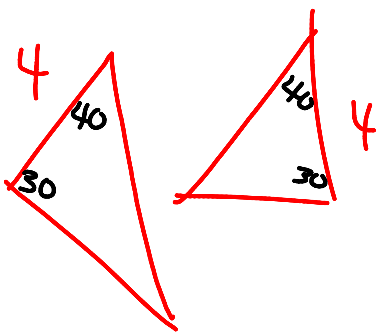
$\cong$

Congruent Triangles:

- Side-Side -Side Congruity (SSS≅)
  - Two triangles are congruent if all three sides have equal measures.
- Side-Angle -Side Congruity (SAS≅)
  - Two triangles are congruent if two sides and the contained angle have the same measures.
- Angle-Side-Angle Congruity (ASA≅) Alyssa Super Awesome
  - Two triangles are congruent if two angles and the contained side have the same measures.



$\therefore \triangle ABC \cong \triangle DTS$ by SAS

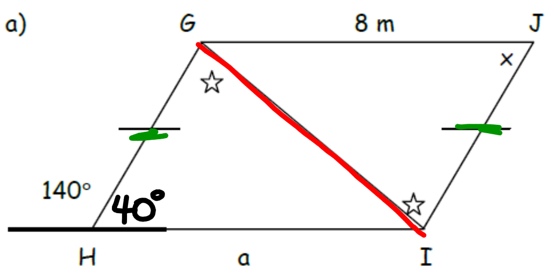


$\therefore \cong$ by ASA

Properties of Congruent Triangles

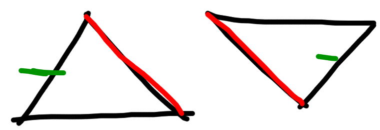
Ex. 2 Prove the following triangles congruent and determine the value of each lower-case letter.

a)



Looking to prove

$\triangle HGI \cong \triangle JIG$



$\angle G = \angle I$

$GI = IG$

$HG = JI$

$\therefore \triangle HGI \cong \triangle JIG$ by SAS.

$\therefore a = 8$ since $\triangle HGI \cong \triangle JIG$

$\therefore x = 40^\circ$ by SAT & $\triangle HGI \cong \triangle JIG$

2L_Similar and Congruent Triangles