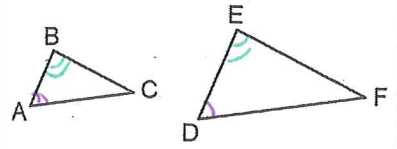
Geometry - 6.3 - Similar Triangles

TRIANGLE SIMILARITY POSTULATES/THEOREMS

AA Similarity Post. (6.1)

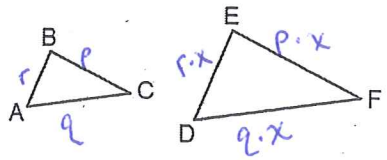


$\angle A \cong \angle D$
$\angle B \cong \angle E$
$\rightarrow \triangle ABC \sim \triangle DEF$

{ AA~ }

SSS Similarity Thm (6.1)

x = scale factor



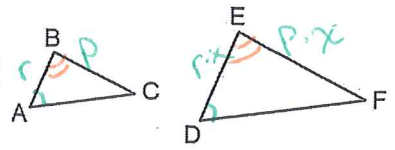
$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

$\downarrow$

$\triangle ABC \sim \triangle DEF$

SSS~

SAS Similarity Thm (6.2)



$\frac{AB}{DE} = \frac{BC}{EF}$
and $\angle B \cong \angle E$
$\rightarrow \triangle ABC \sim \triangle DEF$

SAS~

- Similarity of triangles is also reflexive, symmetric, and transitive.

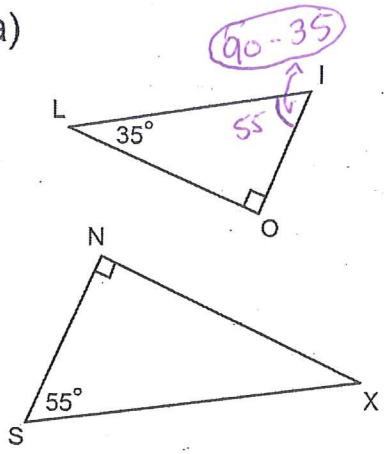
reflexive: $\triangle ABC \sim \triangle ABC$

symmetric: $\triangle ABC \sim \triangle DEF$, $\triangle DEF \sim \triangle ABC$

transitive: $\triangle ABC \sim \triangle DEF$, $\triangle DEF \sim \triangle HJK$, $\triangle ABC \sim \triangle HJK$

Ex 1 - Determine whether the triangles are similar.

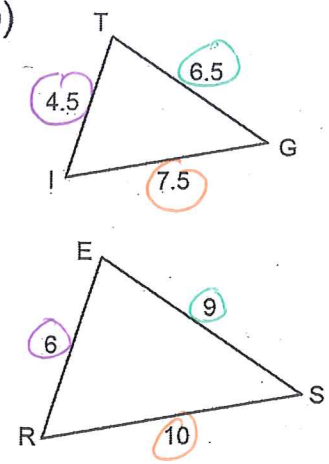
a)



Yes, by AA~

$\triangle LIO \sim \triangle XSN$

b)



$\frac{4.5}{6} = 0.75$

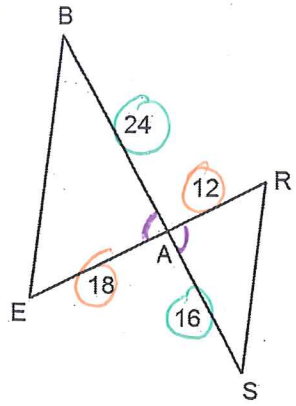
$\frac{6.5}{9} = 0.72$

$\frac{7.5}{10} = 0.75$

- Not the same

$\therefore$ Not similar

c)



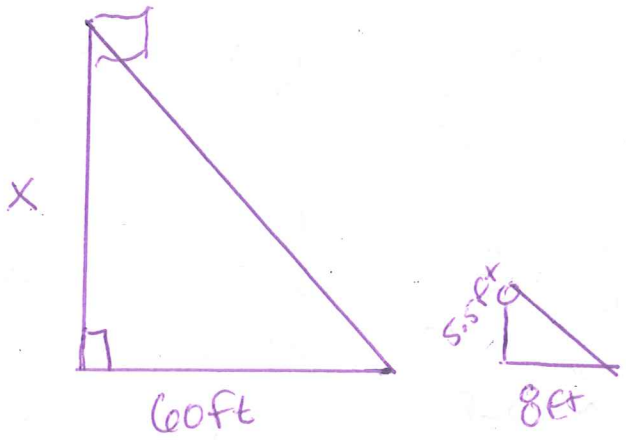
$\frac{24}{16} = \frac{3}{2}$

$\frac{18}{12} = \frac{3}{2}$

- sides proportional

yes by SAS~

Ex 2 - Sadie wants to find out the height of the flagpole at her school. The flagpole is currently casting a shadow that is ~~45~~ 60 feet long. Sadie is 5'6" tall, and her shadow is currently 8 feet long. Find the height of the flagpole.



Flagpole → $\frac{X}{5.5\text{ ft}} = \frac{60\text{ ft}}{8\text{ ft}}$

Sadie →

$$\frac{8x}{8} = \frac{330}{8}$$

$$x = 41.25\text{ ft}$$

$$= 41'3"$$