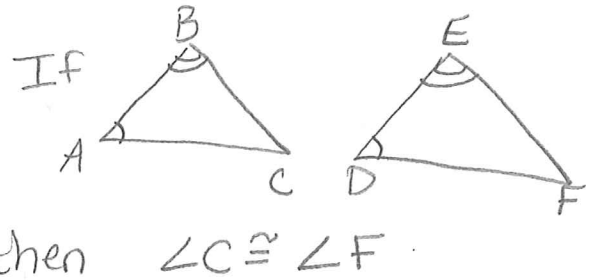


Section 6.4: Use Prove Triangles are Similar by Angle-Angle (AA)

Essential Question: If two figures are similar, how do you find the length of a missing side?

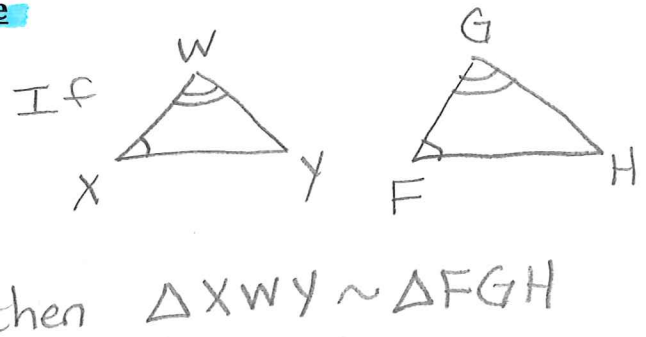
Theorem 4.3: Third Angles Theorem

If 2 angles of one triangle are congruent to 2 angles of a second triangle, then the third angles of the two triangles are congruent.



Postulate 22: Angle-Angle (AA Sim) Similarity Postulate

If 2 angles of one triangle are congruent to 2 angles of a second triangle, then the two triangles are similar.



EXAMPLES:

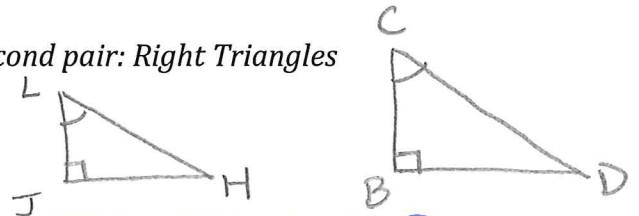
A1. Sketch two pairs of labeled triangles similar by AA Similarity and give a similarity statement.

First pair: Scalene Triangles



$\triangle FGH \sim \triangle JKL$

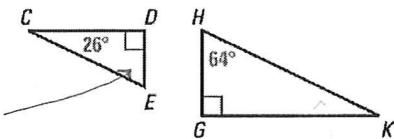
Second pair: Right Triangles



$\triangle JHL \sim \triangle BCD$

A2. Determine whether or not the triangles are similar. Give the reason for their similarity and a similarity statement.

a)



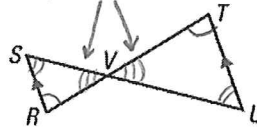
180
-90
-26

64°

Yes, $AA \sim$

$\triangle DEC \sim \triangle GHK$

b) Vertical L's

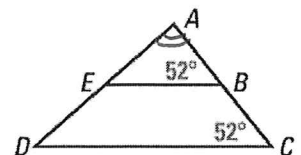


if \parallel $AA \cong$

Yes, $AA \sim$

$\triangle RSV \sim \triangle TUV$

c)



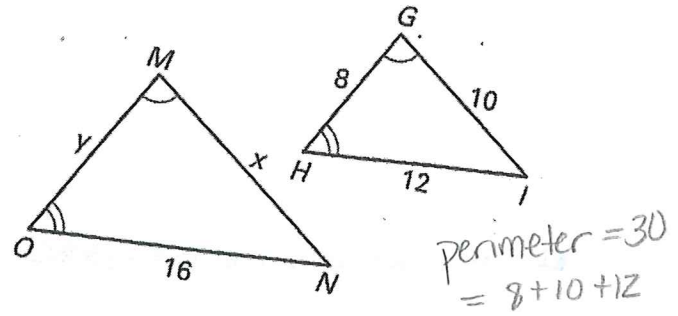
Yes, $AA \sim$

$\triangle ABE \sim \triangle ACD$

A3. Use the figure to answer a-d.

- a) Are the two triangles similar?
Why or why not?

Yes, AA similarity
 $\triangle MON \sim \triangle GHI$



- b) What is the scale factor?

$$\frac{\triangle M}{\triangle G} = \frac{ON}{HI} = \frac{16}{12} = \frac{4}{3} = k$$

- c) Find the value of x.

$$\frac{4}{3} = \frac{MN}{GI} \rightarrow \frac{4}{3} = \frac{x}{10}$$

$$3x = 40$$

$$x = 13.3 \text{ un}$$

- d) What is the perimeter of $\triangle MNO$?

$$\frac{4}{3} = \frac{\text{per } \triangle MNO}{\text{per } \triangle GHI} \rightarrow \frac{4}{3} = \frac{P}{30}$$

$$\frac{3P}{3} = \frac{120}{3}$$

$$P = 40 \text{ un}$$

- A4. The A-frame house in the figure has a balcony that is 16 feet long, 16 feet high, and parallel to the ground. If the building is 28 feet wide at its base, how tall is the house?

$$\text{height} = h = x + 16$$

$$\frac{16}{x} = \frac{28}{x+16}$$

$$28x = 16(x+16)$$

$$28x = 16x + 256$$

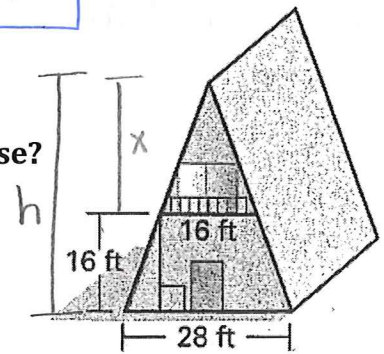
$$-16x$$

$$\frac{12x}{12} = \frac{256}{12}$$

$$x = 21.3$$

$$h = x + 16$$

$$21.3 + 16 = 37.3 \text{ ft}$$



- A5. Russell (5' 9" tall) notices that his shadow is 9 feet long (3 paces) while a nearby light pole has a shadow of 17 paces. About how tall is the light pole?

Russell
Light Pole

$$\frac{5'9''}{x} = \frac{3 \text{ paces}}{17 \text{ paces}}$$

$$\rightarrow \frac{69}{x} = \frac{3}{17} \quad 3x = 1173$$

$$5'9'' = 5(12) + 9'' = 60'' + 9'' = 69''$$

$$\text{or } \frac{391}{12} = 32 \frac{7}{12} = 32'7''$$

$$x = 391''$$

Section 6.4 Summary:

Set up a proportion using the scale factor and the given corresponding side to the missing side.
 Cross multiply and divide to solve. (See example #3c)