Geometry 2H

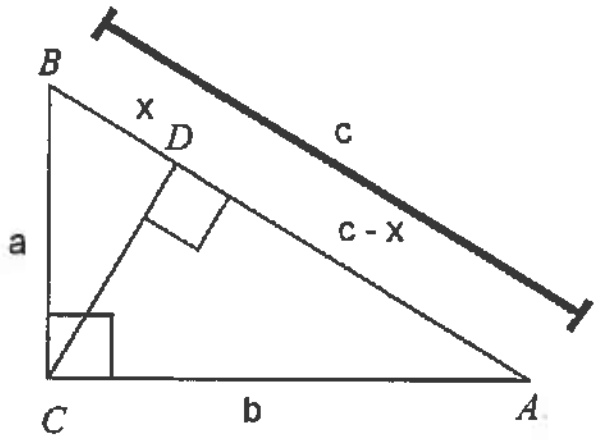
Similarity Part II - REVIEW

Name: _____

Period: 1 2 3 4 5 6 7 8

G-SRT.4. Learning Target: *I can prove the following theorems in narrative paragraphs, flow diagrams, in two column format, and/or using diagrams without words: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem using triangle similarity.*

1. Given the triangle below, prove the Pythagorean Theorem using similar triangles.

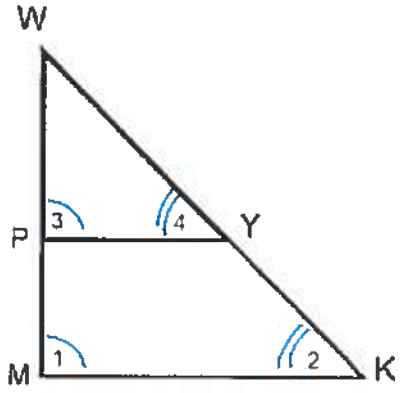


Statement	Reasons
1) $\angle B \cong \angle B; \angle A \cong \angle A$	Reflexive Property
2) $\angle BCA \cong \angle CDB \cong \angle CDA$	All right angles are congruent
3) $\Delta ABC \sim \Delta ACD; \Delta ABC \sim \Delta CBD$	AA~
4) $\frac{x}{a} = \frac{a}{c}$	Corresponding sides of similar Δs are proportional
5) $cx = a^2$	Multiplication Property Cross multiply.
6) $\frac{b}{c} = \frac{c-x}{b}$	Corresponding sides of similar Δs are proportional
7) $b^2 = c^2 - cx$	Multiplication Property Cross-Multiply
8) $b^2 = c^2 - a^2$	Substitution Property
9) $a^2 + b^2 = c^2$	Addition Property of Multiplication.

2. Given the triangle below, prove that a line parallel to one side of a triangle divides the other two proportionally.

Given: $\overline{PY} \| \overline{MK}$

Prove: $\frac{MP}{PW} = \frac{KY}{YW}$



Statement	Reasons
1) $\overline{PY} \| \overline{MK}$	Given
2) $\angle 1 \cong \angle 3, \angle 2 \cong \angle 4$	Corresponding $\angle$s are Congruent
3) $\Delta WMK \sim \Delta WPY$	AA~
4) $\frac{MW}{PW} = \frac{KW}{YW}$	Corresponding Sides of Similar Triangle, R Proportional
5) $MW = MP + PW$ $KW = KY + YW$	Segment Addition Postulate
6) $\frac{MP+PW}{PW} = \frac{KY+YW}{YW}$	Substitution Property
7) $\frac{MP}{PW} = \frac{KY}{YW}$	Subtraction Property

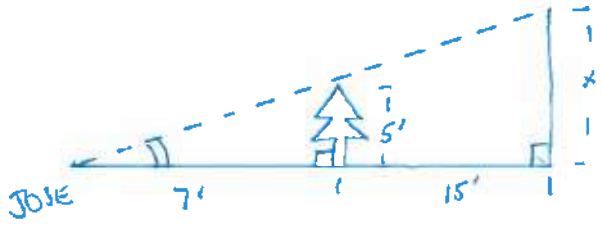
Geometry 2H: Triangle Similarity REVIEW

Name: _____

G-SRT.5. Learning Target: *I can solve problems using similarity criteria for triangles. I can prove relationships in geometry figures using similarity criteria for triangles.*

3. Jose wants to find the height of a building. There is a tree 7 feet in front of him, which he knows is 5 feet tall. The tree is 15 feet from the building.

(a) Draw a picture with the information given.



(b) How are the two triangles similar? AA~

(b) What is the height of the building? (Round to the nearest foot.)

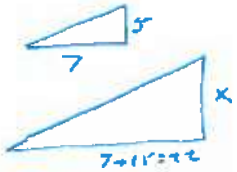
$\frac{7}{5} = \frac{22}{x}$

$5 \cdot 22$

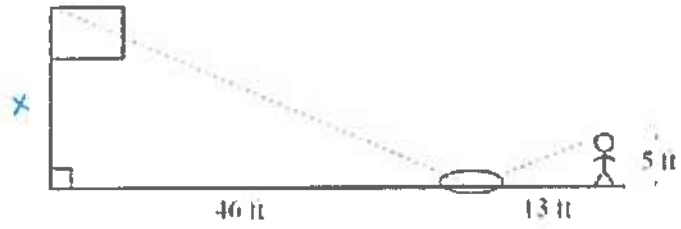
$\frac{110}{7} = \frac{7x}{7}$

$X = 15.7$

X = 16 Feet



4. Karen wanted to measure the height of her school's flagpole. She placed a mirror on the ground 46 feet from the flagpole, and then walked backwards until she was able to see the top of the pole in the mirror. Her eyes were 5 feet above the ground and she was 13 feet from the mirror. Using similar triangles, find the height of the flagpole to the nearest tenth of a foot. (Figures may not be drawn to scale)



$\frac{5}{13} = \frac{x}{46}$

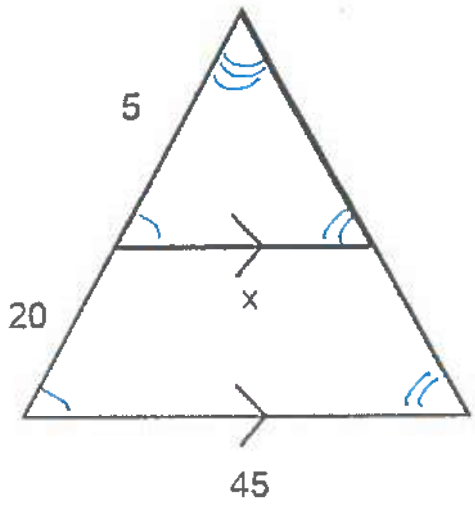
$5 \cdot 46 = 13 \cdot x$

$230 = 13x$

$X = 17.69$

Height of the Flagpole is 17.7 Ft

5. Use the picture below to answer the following questions.



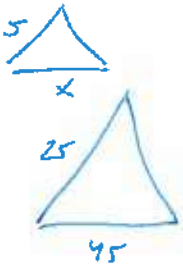
(a) Is there enough information to prove the two triangles are similar? Yes Corresponding Angle AA~ Share ∠ Angle

(b) If so, find the value of x. If not, what additional information would be needed?

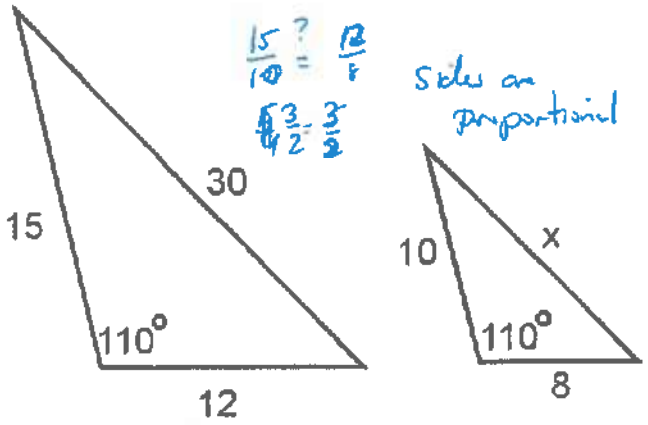
$\frac{5}{20+5} = \frac{x}{45}$

$30x = 225$

X = 7.5 Ft



6. Given the two triangles shown below,



$\frac{15}{10} \stackrel{?}{=} \frac{12}{8}$

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

Sides are proportional

(a) What similarity method makes it possible to find the value of x? SAS~

(b) Find the value of x.

$\frac{15}{10} = \frac{30}{x}$

$10 \cdot 30 = 15 \cdot x$

$\frac{300}{15} = \frac{15x}{15}$

X = 20

Geometry 2H: Triangle Similarity REVIEW

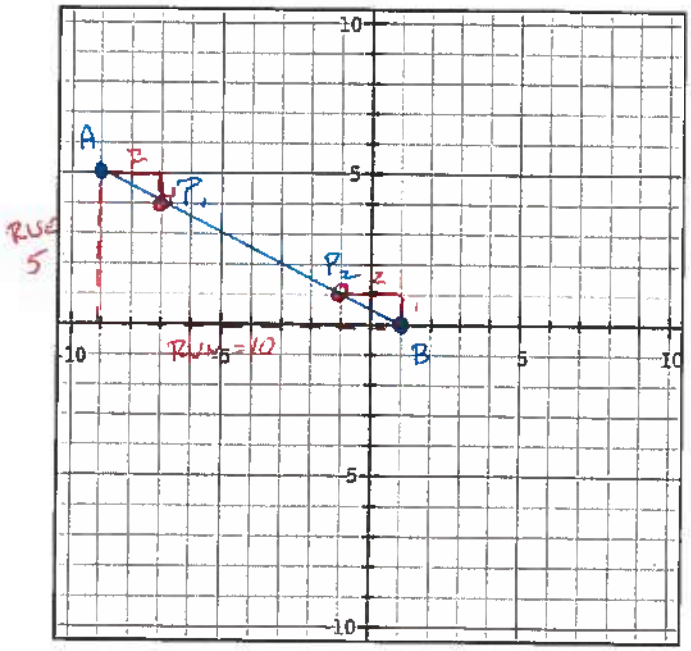
Name: _____

G-GPE.6. Learning Target: *I can find the point on a directed line segment between two given points that partitions the segment in a given ratio.*

7. Line segment AB in the coordinate plane has endpoints with coordinates A $(-9,5)$ and $B(1,0)$ Graph $\overline{AB}$ and find the locations of point P so that P divides $\overline{AB}$ into two parts with lengths in a ratio of 1:4.

NOTE: There are TWO possible answers. You must find both for full credit.

Show all of your work.



RATIO TO FRACTION $1:4 \Rightarrow \frac{1}{1+4} = \frac{1}{5}$

RISE = 5 RUN = 10

NEW RISE = $5 \cdot \frac{1}{5}$ NEW RUN = $10 \cdot \frac{1}{5}$

= 1 = 2

POINT 1 $P_1(-7,4)$

POINT 2 $P_2(-1,1)$