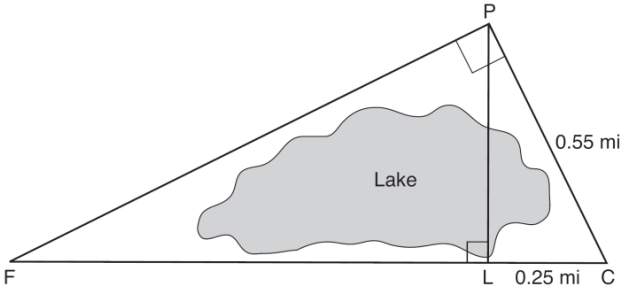
Name: _____ Date: _____

UNIT 5 **LESSON 5**

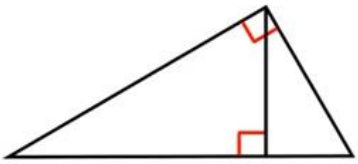
AIM: HOW DO WE SOLVE PROPORTIONS IN SIMILAR RIGHT TRIANGLES (DAY 1- SAAS)?

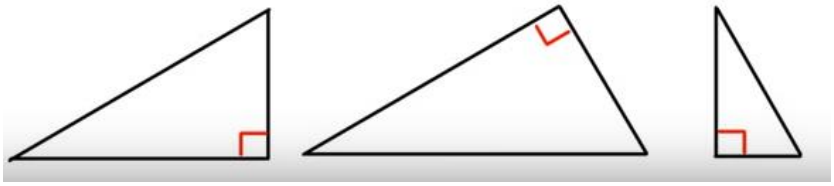
Do Now: Determine and state to the nearest hundredth of a mile the length of $\overline{PL}$.



Follow along with the video to complete the following *(STOP @ 9:48)*:

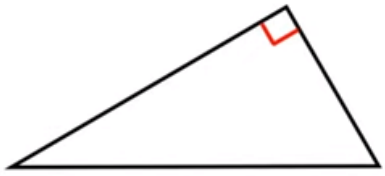
- Define **ALTITUDE**: _____
- Follow along and mark the diagrams below with the video:

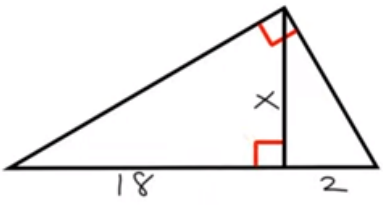


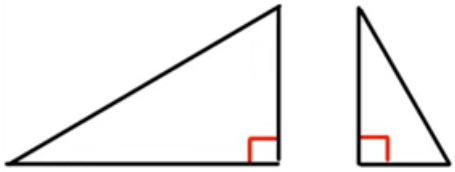


- Therefore, whenever you have a _____ triangle with an altitude drawn to the _____, all 3 triangles will be _____! Sides of similar triangles are in proportion!

Solve for x:







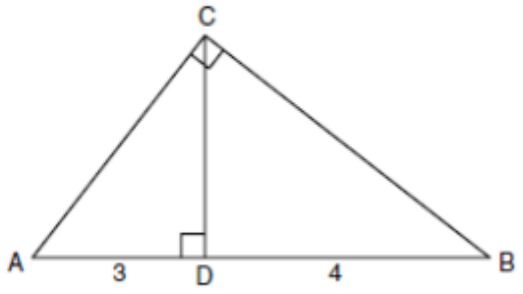
WHAT IS A FASTER WAY TO DO THIS?!

Definition: The **mean proportional, or geometric mean,** of two positive numbers a and b is the positive number x such that $\frac{a}{x} = \frac{x}{b}$. When solving, $x = \sqrt{a \cdot b}$.

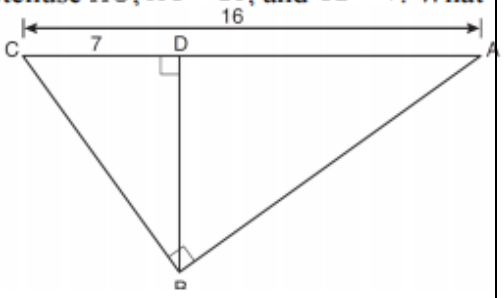
Notice that the x value appears TWICE in the "means" positions of the proportion.

PRACTICE PROBLEMS!

1 In the diagram below of right triangle ACB, altitude $\overline{CD}$ intersects $\overline{AB}$ at D. If $AD = 3$ and $DB = 4$, find the length of $\overline{CD}$ in simplest radical form.

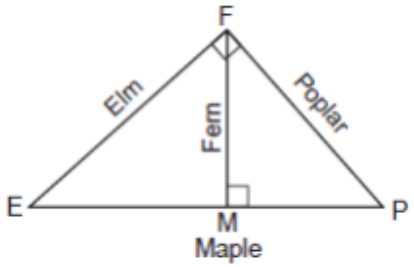


2 In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $AC = 16$, and $CD = 7$. What is the length of $\overline{BD}$ in simplest radical form?



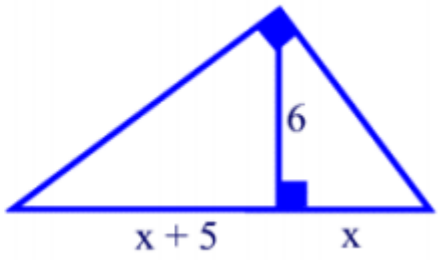
3 In right triangle ABC, $\overline{CD}$ is the altitude to the hypotenuse, $\overline{AB}$. If the length of the altitude is 8 feet and the length of the shorter segments is 2 feet, find the length of the longer segment.

4 Four streets in a town are illustrated in the accompanying diagram. If the distance from F to M is 12 miles and the distance on Maple Street from E to M is 10 miles, find the distance on Maple Street, in miles, from M to P.



5 In right triangle ABC, $\overline{CD}$ is the altitude to the hypotenuse, $\overline{AB}$. The segments of the hypotenuse, $\overline{AB}$, are in the ratio of 1:4. The altitude is 6. Find the two segments of the hypotenuse.

6 Given the diagram to the right, solve for x.

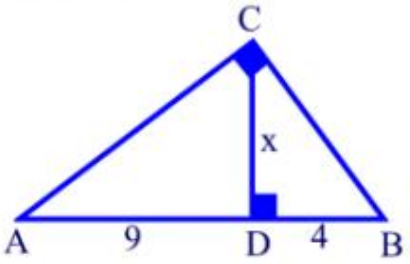


Name: _____ Date: _____

UNIT 5 **LESSON 5**

HOMEWORK

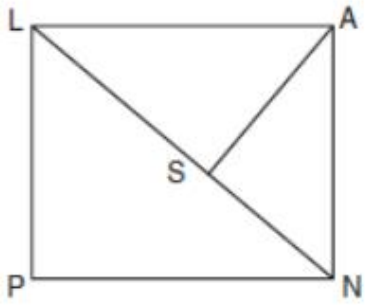
1. In the diagram below of right triangle ACB, altitude $\overline{CD}$ intersects $\overline{AB}$ at D. Find the length of $\overline{CD}$.



2. The accompanying diagram shows part of the architectural plans for a structural support of a building. $PLAN$ is a rectangle and $\overline{AS} \perp \overline{LN}$. Which equation can be used to find the length of $\overline{AS}$?

1) $\frac{LS}{AS} = \frac{AS}{SN}$ 3) $\frac{AS}{SN} = \frac{AS}{LS}$

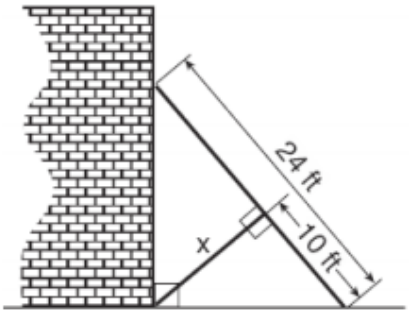
2) $\frac{AN}{LN} = \frac{AS}{LS}$ 4) $\frac{AS}{LS} = \frac{LS}{SN}$



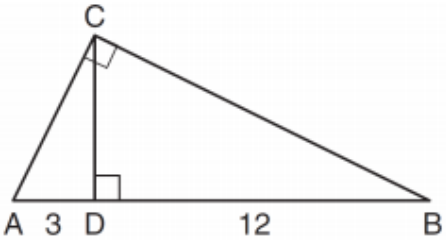
3. The accompanying diagram shows a 24-foot ladder leaning against a building. A steel brace extends from the ladder to the point where the building meets the ground. The brace forms a right angle with the ladder. If the steel brace is connected to the ladder at a point that is 10 feet from the foot of the ladder, which equation can be used to find the length, x, of the steel brace?

(1) $\frac{10}{x} = \frac{x}{14}$ (3) $10^2 + x^2 = 14^2$

(2) $\frac{10}{x} = \frac{x}{24}$ (4) $10^2 + x^2 = 24^2$



4. In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?



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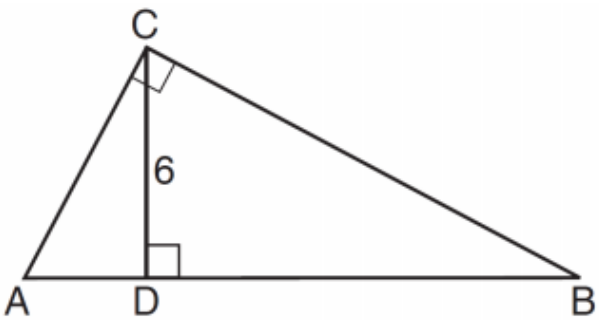
5. In right triangle ABC below, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If $CD = 6$ and the ratio of AD to AB is 1:5, determine and state the length of $\overline{BD}$.



6. What is the solution set for the equation $x^2 - 5x = 6$?

https://www.youtube.com/watch?v=9d9fjv5WwBQ