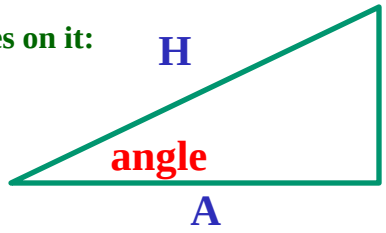
Steps for solving Trig problems **Trig Worksheet #4**

0. If it's a word problem, then draw this triangle (and only this triangle)

the hypotenuse has slant distances on it: string to kites, things leaning

angle in problem goes here



the vertical side has vertical distances on it: height, altitude, tall, up the wall, etc

the horizontal side has ground distances on it: distances from bases, shadows, any thing on the ground

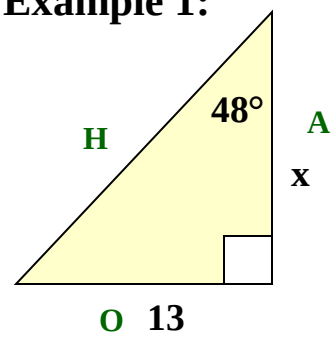
1. **Label each side of the triangle as H for hypotenuse (opposite 90°)**
   O for opposite the given angle **A for side adjacent to given angle**
2. **Determine using the information (sides and angles) given in the problem which of the trig functions you need to solve for variable**

$$\sin(\text{angle}) = \frac{\text{opp}}{\text{hyp}} \qquad \cos(\text{angle}) = \frac{\text{adj}}{\text{hyp}} \qquad \tan(\text{angle}) = \frac{\text{opp}}{\text{adj}}$$

3. **Set up an equation using the trig function and the variable**

4. **Solve for the variable (remember the shortcut shown in example 2!)**

Example 1:



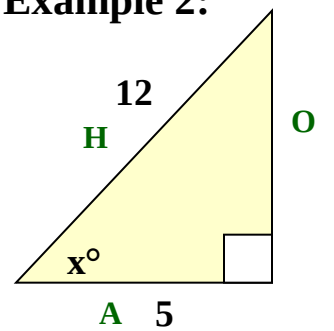
1) 13 is O , x is A and no value for H
2) Since we have no H we need to use tan

3) tan (48°) = 13 / x (if x is on bottom then
4) x = 13 / tan (48°) = 11.71 switch it with the other side of the = sign)

Use 90 – 48 = 42 to find the other angle
Use Pythagorean Theorem to find one missing side

A *12 foot* ladder is leaning against the barn. When the bottom is *5 feet* away from the base of the wall, what is the *angle* of elevation?

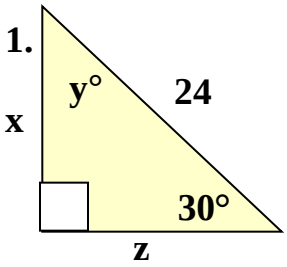
Example 2:



0) Draw and label distances in triangle
1) 12 is H , 5 is A and no value for O
2) Since we have A and H, we use cos

3) cos (x°) = 5 / 12 (since x is the angle
4) $x = \cos^{-1}(5/12) = 65.38°$ use inverse trig)

1.



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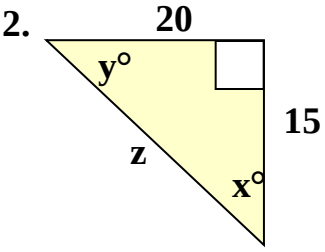

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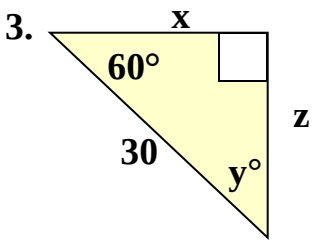

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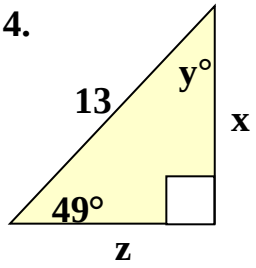

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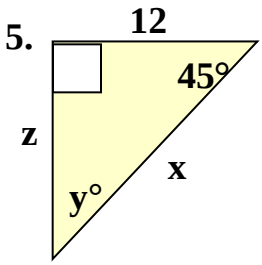

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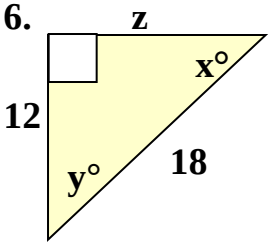

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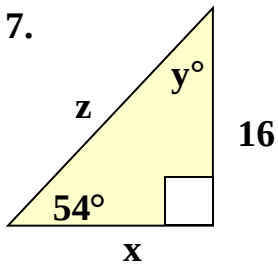

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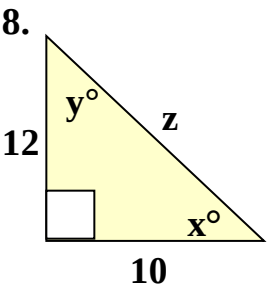
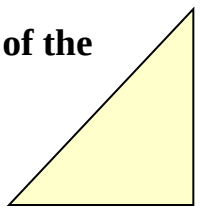


9. What angle is formed between a 18 foot ladder and the floor, if the end of the ladder is 12 feet up the wall of the auditorium?



50 pts -- Work problems on separate sheet of paper for turn-in