7-1 Solving for Sides of a Triangle
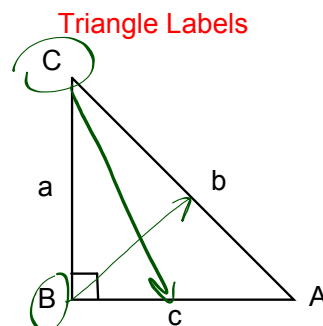
Objectives:

1. I can set up and solve a trig ratio

2. I can set up and solve pythagorean theorem

Triangle Labels

Upper Case= Angles   Lower Case= Sides

The side is always opposite the angle

Feb 26-11:19 AM   Feb 26-11:20 AM

We can solve for the sides of a triangle by:

- Trigonometric Ratio

     sinA

     cosA

     tanA

Pythagorean Theorem

$$a^2 + b^2 = c^2$$

$$leg^2 + leg^2 = hyp^2$$

SOH CAH TOA
sine   Cosine   tangent

Trigonometric Ratios

$$\sin A = \frac{opp.}{hyp.} = \quad\quad \csc A = \frac{hyp.}{opp.} =$$

angle

$$\cos A = \frac{adj.}{hyp.} = \quad\quad \sec A = \frac{hyp.}{adj.} =$$

$$\tan A = \frac{opp.}{adj.} = \quad\quad \cot A = \frac{adj.}{opp.} =$$

opp   hyp

adj   A
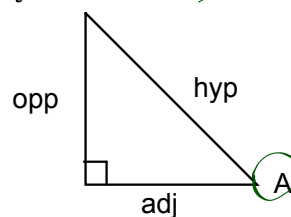
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Find all trig ratios for X

opp
12 Z
y

$\sin x = \dfrac{12}{13}$

5 adj

$\cos x = \dfrac{5}{13}$

13 hyp

X

$\tan x = \dfrac{12}{5}$

Solve for x

$X \sin 32° = \dfrac{5}{x}$

$\dfrac{X \cdot \sin 32°}{\sin 32°} = \dfrac{5}{\sin 32°}$

$X = \dfrac{5}{\sin 32°}$

$x = 9.4$

opp x hyp
5
32°

Solve for p

$12 \cdot \cos 57° = \dfrac{p}{12} \cdot 12$

hyp
12 57°

p adj

$P = 12 \cdot \cos 57°$

$P = 6.5$
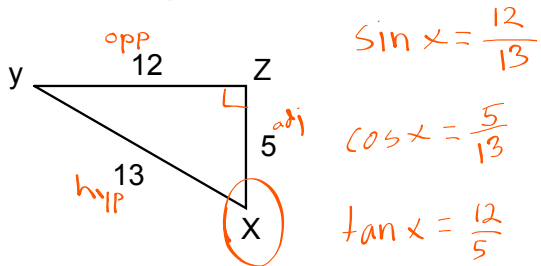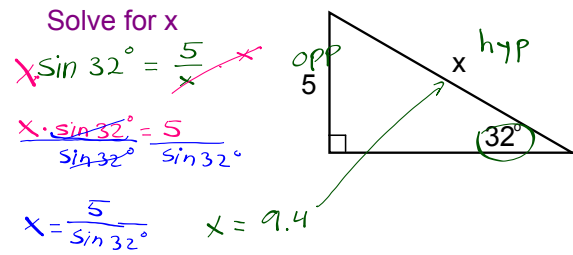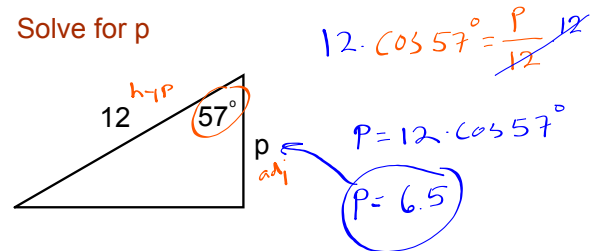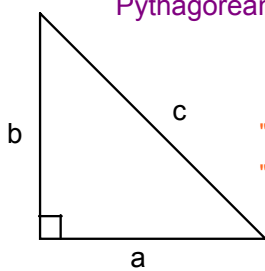
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Pythagorean Theorem
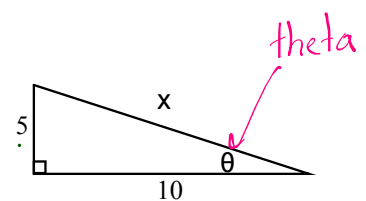
$$a^2 + b^2 = c^2$$

b   c

"a" and "b" are the sides

"c" is always the hypotenuse

a

*Can only use when there is 1 missing side.

If there are 2 missing sides, then use a trig ratio

Solve for x
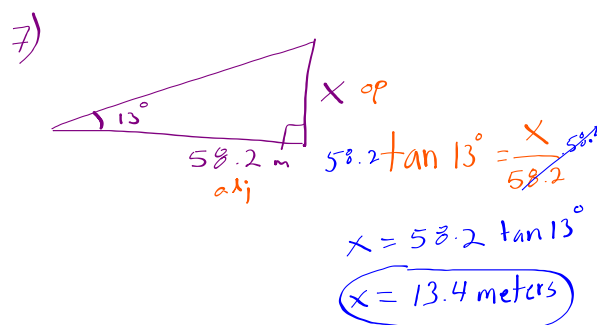
$5^2 + 10^2 = x^2$

$25 + 100 = x^2$

$\sqrt{125} = \sqrt{x^2}$

$11.2 = x$

x theta
5
θ
10

15

$x^2 + 15^2 = 17^2$

$x^2 + 225 = 289$

$-225 \quad -225$

$\sqrt{x^2} = \sqrt{64}$

x = 8

17

x = 8

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Standing 12ft from a tree you must look up at 43° to see the top of the tree. How tall is the tree?

7)

$$58.2 \tan 13° = \frac{x}{58.2}$$

$$x = 58.2 \tan 13°$$

$$\boxed{x = 13.4 \text{ meters}}$$

Dec 16-9:39 AM   Feb 1-9:32 AM