Day 2 - Find missing sides of triangles using trigonometry

DIRT - Do I Remember This?

1. Solve for the variable: $-(1 + 7x) - 6(-7 - x) = 36$

$-1 - 7x + 42 + 6x = 36$

$-1x + 41 = 36$

$ - 41 = -41$

$\dfrac{-1x}{-1} = \dfrac{-5}{-1}$

$\boxed{x = 5}$

2. Solve the following for the variable: $\dfrac{7}{(x + 3)} = \dfrac{5}{(2x-1)}$

$7(2x - 1) = 5(x + 3)$

$14x - 7 = 5x + 15$

$ + 7$

$14x = 5x + 22$

$-5x \quad -5x$

$\dfrac{9x}{9} = \dfrac{22}{9}$

$\boxed{x = \dfrac{22}{9}}$

3. Identify the relationship between the following angles:

<1 & <4 ___Corr___

<1 & <10 ___SS Ext___

<9 & <6 ___Alt Ext___

<6 & <7 ___linear pair___

<8 & <2 ___None___

<4 & <5 ___Vert___

<4 & <3 ___linear pair___

<3 & <10 ___None___
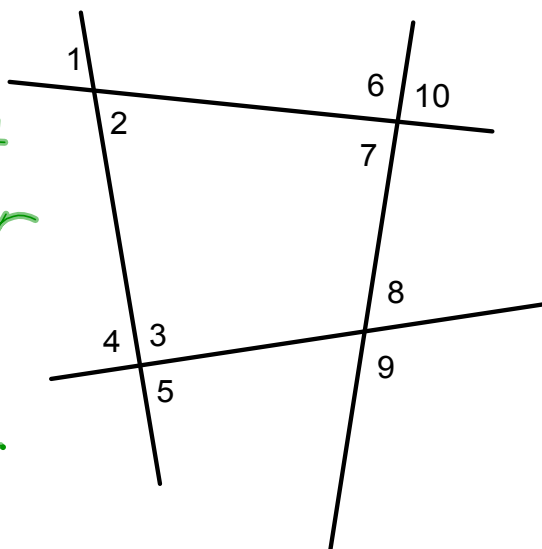
9.2 Sine, Cosine, and Tangent Ratios

Objective: To use tangent, sine and cosine to find missing side lengths.

G.1.A.
Performance Standard: 1.6, 3.4 DOK-2
Knowledge Level: MA 2, MA 4

SOH-CAH-TOA   or   Ollie Hit A Homerun
Over Andy

SIN θ = opposite side
hypotenuse side

SIN θ = O - Ollie
H - Hit
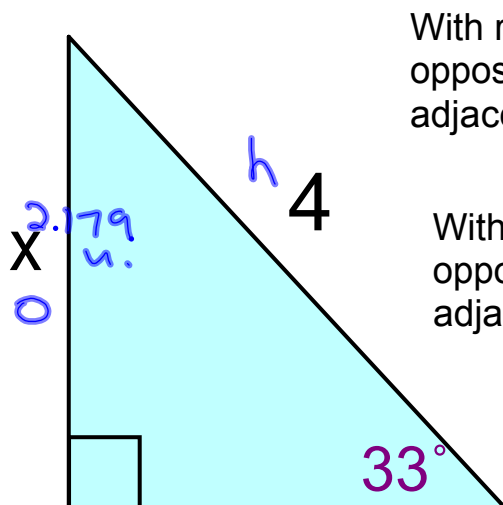
COS θ = adjacent side
hypotenuse side

COS θ = A - A
H - Homerun

TAN θ = opposite side
adjacent side

TAN θ = O - Over
A - Andy

Find the values of the missing variables.

With regard to 33°, is the "x" on the opposite side, the hypotenuse, or the adjacent side? __Opposite__

h 4

x $^{2.179}_{u.}$

o

With regard to 33°, is the "4" on the opposite side, the hypotenuse, or the adjacent side? __hypotenuse__

33°

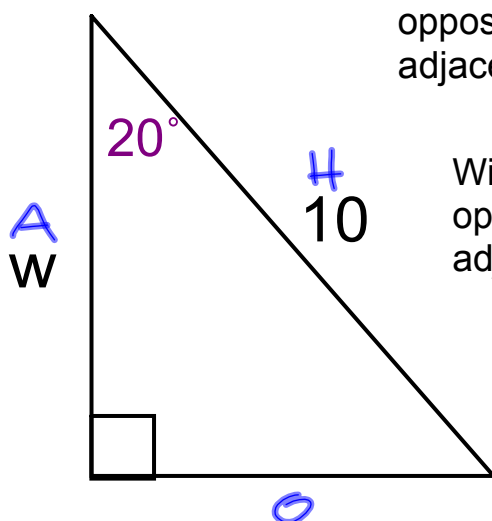Which trig ratio should we use to find the value of "x"? __Sine__

Find x: $\sin \theta = \dfrac{o}{h}$

$4 \cdot \sin 33° = \dfrac{x}{4} \cdot 4$

$4 \cdot \sin 33° = x$

$\boxed{2.179_u = x}$

With regard to 20°, is the "w" on the opposite side, the hypotenuse, or the adjacent side? __adjacent__

20°

A
W

H
10

With regard to 20°, is the "10" on the opposite side, the hypotenuse, or the adjacent side? __hypotenuse__

o

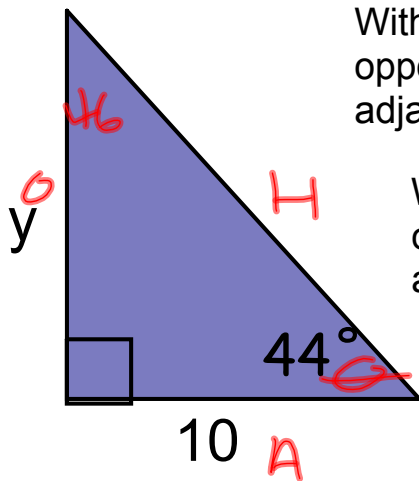Which trig ratio should we use to find the value of "w"? __Cosine__

Find w: $\cos \theta = \dfrac{a}{h}$

$10 \cdot \cos 20° = \dfrac{w}{10} \cdot 10$

$10 \cos 20° = w$

$9.397_u = w$

With regard to 44°, is the "y" on the opposite side, the hypotenuse, or the adjacent side? _____ OPP _____

With regard to 44°, is the "10" on the opposite side, the hypotenuse, or the adjacent side? _____ Adj _____

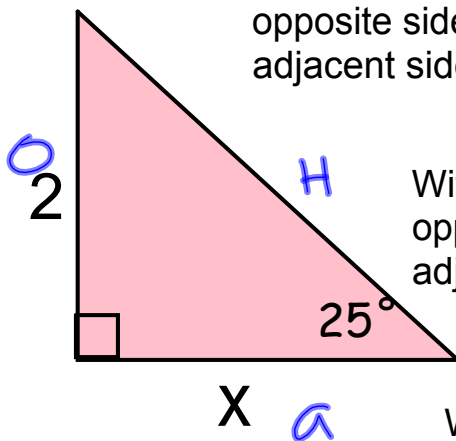Which trig ratio should we use to find the value of "y"? __ TAN __

SOH CAH TOA

Find y: 9.657 $\tan \theta = \dfrac{OPP}{ADJ}$

units

$10 \tan 44 = \dfrac{y}{10}$

With regard to 25°, is the "x" on the opposite side, the hypotenuse, or the adjacent side? __ adjacent __

With regard to 25°, is the "2" on the opposite side, the hypotenuse, or the adjacent side? __ opposite __

Which trig ratio should we use to find the value of "x"? __ tangent __
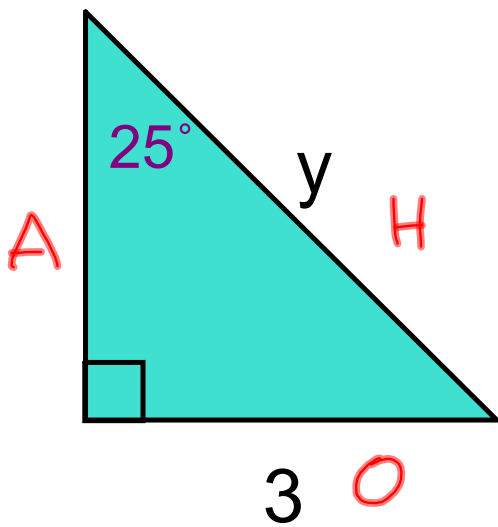
Find x:

$\tan \theta = \dfrac{O}{a}$

$x \cdot \tan 25 = \dfrac{2}{x} \cdot x$

$\tan 25 = \dfrac{2}{x}$ $\dfrac{x \tan 25}{\tan 25} = \dfrac{2}{\tan 25}$

$X = \dfrac{2}{\tan 25}$

$X = 4.289$

Find y:

25° A y H 3 O

$$\sin \theta = \frac{O}{H}$$

$$\sin 25° = \frac{3}{y}$$

$$y = \frac{3}{\sin 25}$$

$$y = 7.099 \text{ u}$$

Find m:

17° A 5 m H O
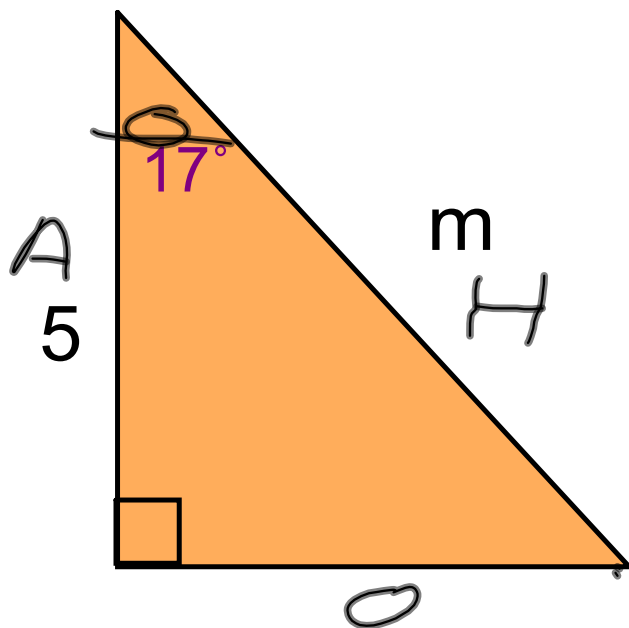
$$\cos \theta = \frac{ADJ}{HYP}$$

$$\cos 17 = \frac{5}{M}$$
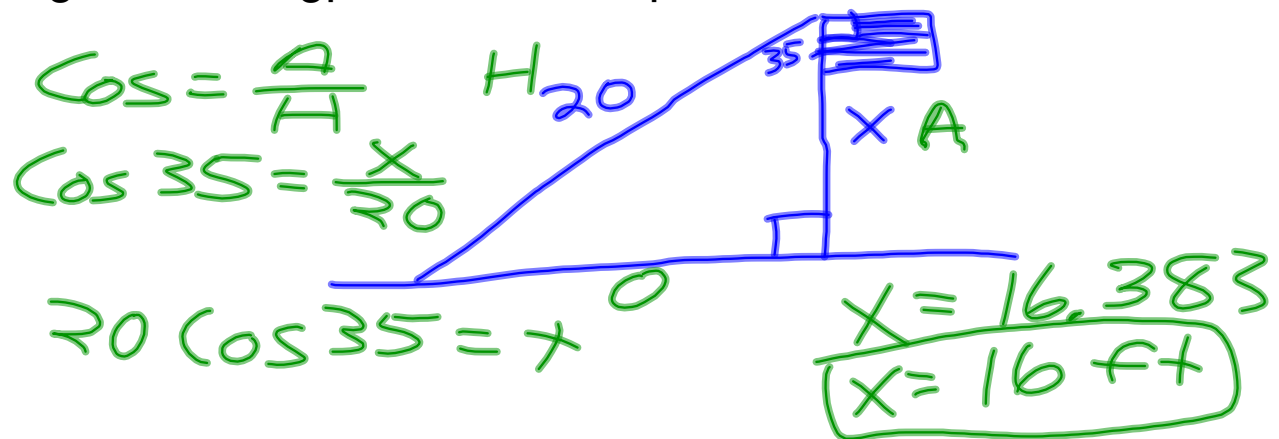
$$M = \frac{5}{\cos 17}$$

$$M = 5.228 \text{ units}$$

To measure the height of a tree, Alma walked 125 ft from the tree and measured a 32° angle from the ground to the top of the tree. Estimate the height of the tree.

H

x O

32°

125 ft

A
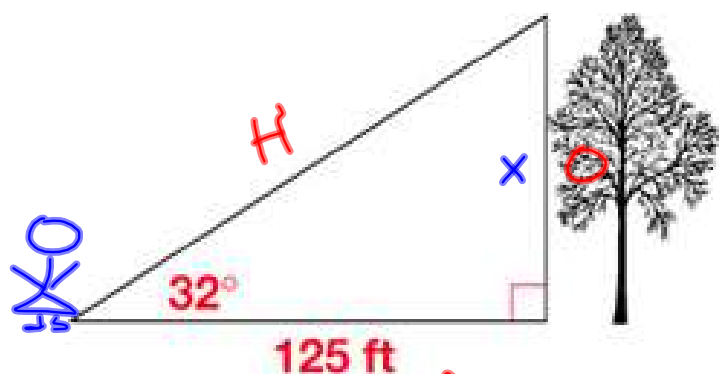
∴, the tree
is 78.109 ft
tall.

$$\tan\theta = \frac{O}{A}$$
$$\tan 32 = \frac{x}{125}$$
$$125\tan 32 = x$$
$$78.109 = x$$

A 20-ft. wire supporting a flagpole forms a 35° angle with the flagpole. To the nearest foot, how high is the flagpole? Draw a picture and solve.

$$Cos = \frac{A}{H}$$

$$Cos\ 35 = \frac{x}{20}$$

$$20\ Cos\ 35 = x$$

$$x = 16.383$$

$$x = 16\ ft$$

Assignment: WS#3