Homework Questions- (WB Pg 77)

① $\dfrac{x}{\cancel{3}_{1}} \cdot \dfrac{\cancel{15}^{5}}{y} = \dfrac{5x}{y}$

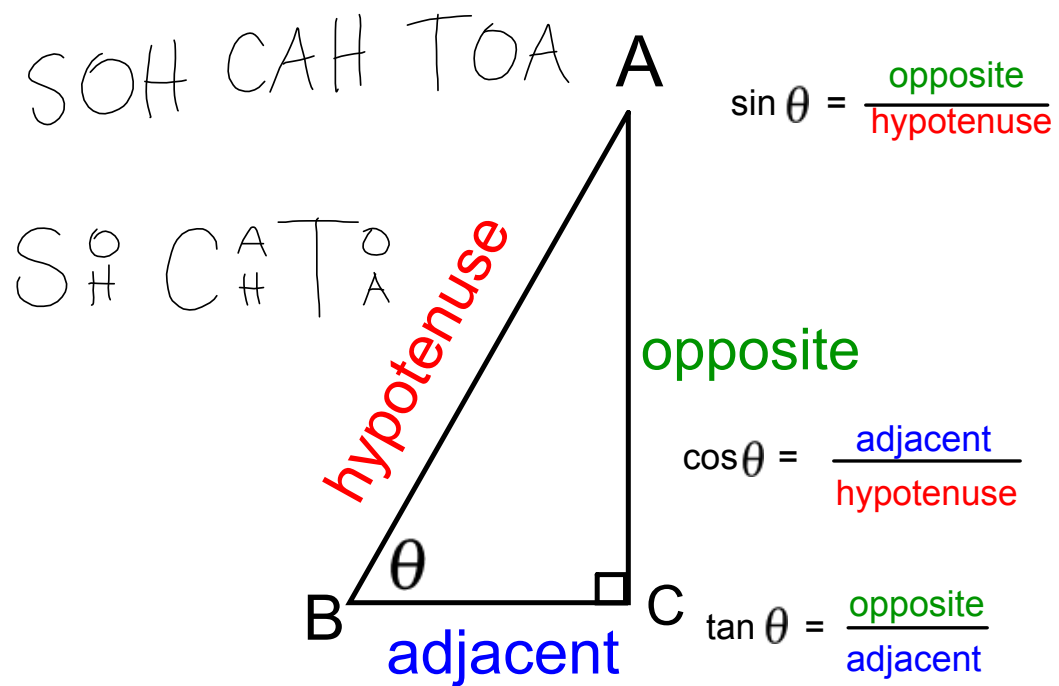⑮ $\dfrac{6x-9}{2x} = \dfrac{3}{5}$

$30x - 45 = 6x$

$-45 = -24x$

$x = \dfrac{45}{24}$

14.3 Right Triangles and Trigonometric Ratios

RIGHT TRIANGLE TRIGONOMETRY

Trigonometry comes from the Greek words *trigonon* and *metria* meaning "triangle measurement."

SOH CAH TOA

S_H^O C_H^A T_A^O

A

$\sin \theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$

hypotenuse

opposite

$\cos \theta = \dfrac{\text{adjacent}}{\text{hypotenuse}}$

θ

B

adjacent

C

$\tan \theta = \dfrac{\text{opposite}}{\text{adjacent}}$

There are 3 more trig functions which are the reciprocals of sin, cos and tan

$\sin \theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$ $\cos \theta = \dfrac{\text{adjacent}}{\text{hypotenuse}}$ $\tan \theta = \dfrac{\text{opposite}}{\text{adjacent}}$

$\csc \theta = \dfrac{\text{hyp}}{\text{opp}}$ $\sec \theta = \dfrac{\text{hyp}}{\text{adj}}$ $\cot \theta = \dfrac{\text{adj}}{\text{opp}}$

cosecant   secant   cotangent

Find the following Trigonometric ratios.

B

$\bigcirc$

13

12

C $\underset{H}{\overset{A}{\cdot}}$

θ

C   5   A

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

$S\overset{O}{\underset{H}{}}$

$\csc A = \dfrac{13}{12}$

$\sec A = \dfrac{13}{5}$

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

$\cot B = \dfrac{12}{5}$

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

$COSA = \dfrac{5}{13}$
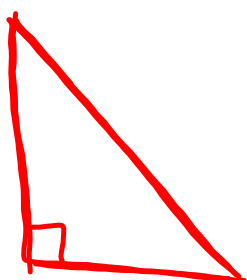
Important things to remember:

$\sin \dfrac{}{h}$

$\cos \dfrac{}{h}$
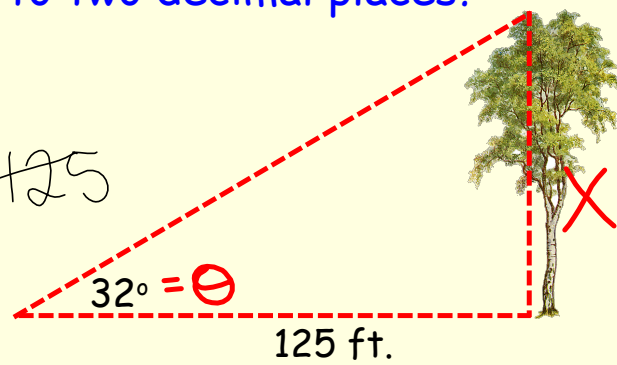
1. Only the tangent can be greater than one.
2. Have your calculator in degrees mode.

1) How tall is this tree to two decimal places?
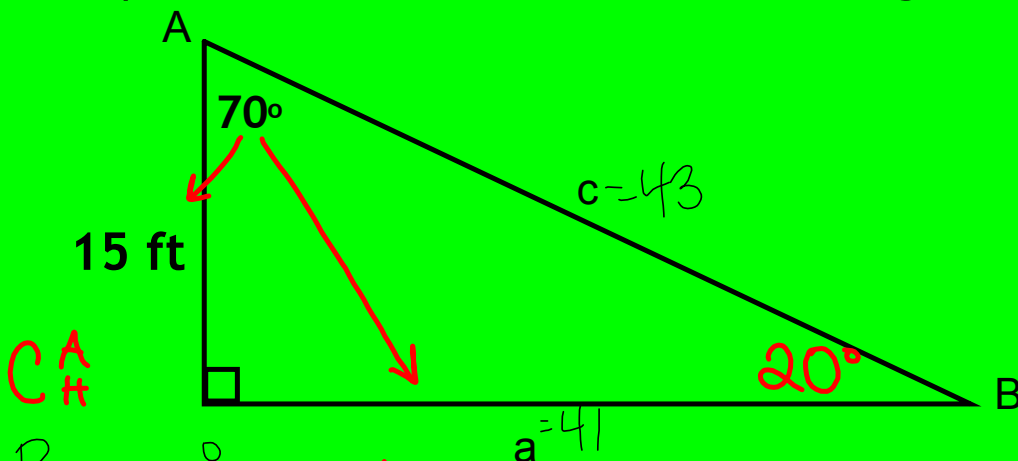
T^O_A

$125° \tan 32 = \dfrac{x}{125} \cdot 125$

32° = Θ

125 ft.

$\boxed{x = 78.11 ft}$

$\tan 32° = \dfrac{x}{125}$

125 * (tan 32°) = x

About 78.11 feet

2) Find all the sides and angles.

A

70°

15 ft

c = 43

20°

B

a = 41

$C \overset{A}{H}$

$B = 70 + 90 = 160 , \; 180 - 160 = 20$
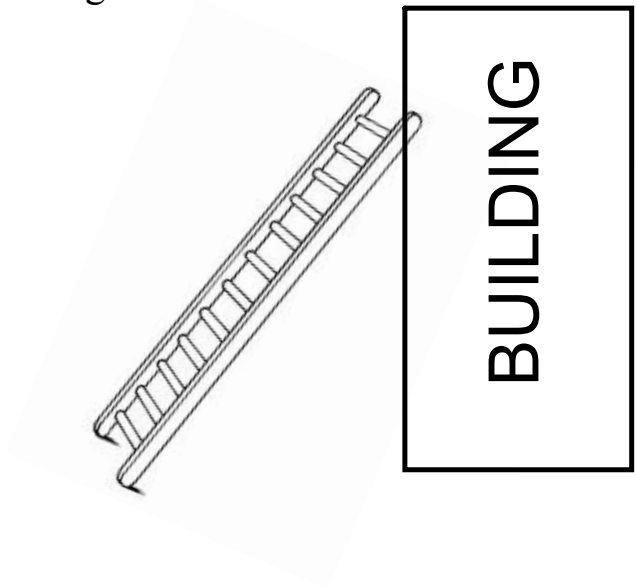
$a = \tan 70 = \dfrac{a}{15} = 15 \cdot \tan 70 = 41.21$

$C = \cos 70 = \dfrac{15}{c} \cdot c$

$\dfrac{C \cdot \cos 70}{\cos 70} = \dfrac{15}{\cos 70}$

$C = 43.86$

3)   A 10-foot ladder is to be placed against the side of a building. The base of the ladder must be placed at an angle of 72° with the level ground for a secure footingThe base of the ladder shouldbe placed _____ feet **from** the side of the building and should reach _____ feet **up** the side of the building.

BUILDING

4) To find the angle, use the INVERSE.

$\tan^{-1}$ $\cos^{-1}$ $\sin^{-1}$

arctan   arccos   arcsin

A

20

θ 46.4°
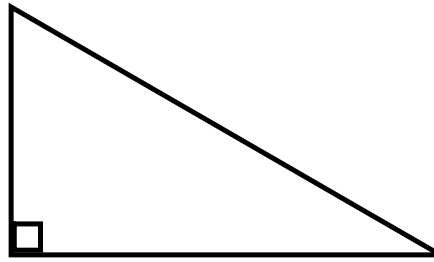
43.6°

T^{O}_{A} C   21   B

180
- 90
___
90

- 46.4
___
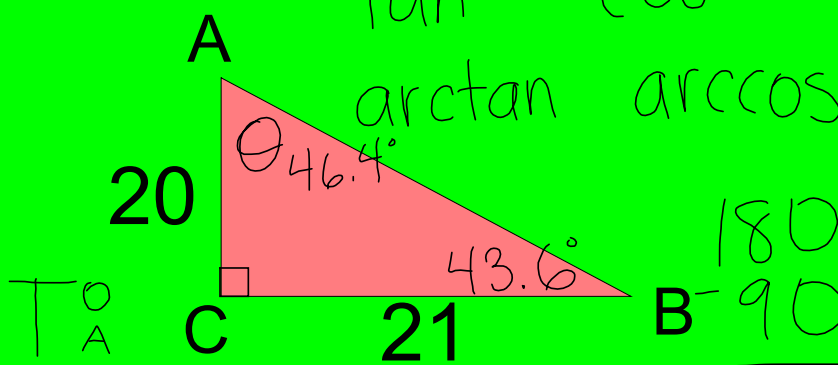
$\tan^{-1}(\tan(\theta)) = \dfrac{21}{20}$

$\theta = \tan^{-1}\left(\dfrac{21}{20}\right)$

$\theta = 46.40°$

Sketch a right triangle with θ as the measure of one acute angle. Find the other five trigonmetric ratios of θ .

$\sin \theta =$

$\tan \theta =$

$\csc \theta =$

$\sec \theta =$

$\cos \theta =$

$\cot \theta = \dfrac{12}{5}$

HW 14.3

P. 796 #1, 2, 5-8, #19-23 odd, 25-28 all, 35-41 odd

EXTRA RIGHT TRIANGLE TRIG PROBLEMS
on the following slides

WARM UP

You are at a parade looking up at a large balloon floating directly above the street. You are 60 feet from a point on the street directly beneath the balloon. To see the top of the balloon, you look up at an angle of 53°. To see the bottom of the balloon, you look up at an angle of 29°. Find the height of the balloon to the nearest foot.
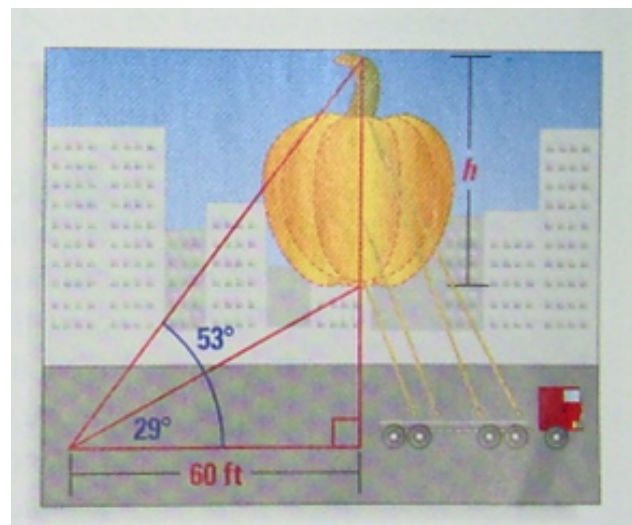
Trig Worksheet

A lighthouse is built on the edge of a cliff near the ocean, as shown in the accompanying diagram. From a boat located 200 feet from the base of the cliff, the angle of elevation to the top of the cliff is 18° and the angle of elevation to the top of the lighthouse is 28°. What is the height of the lighthouse, x, to the *nearest tenth of a foot*?
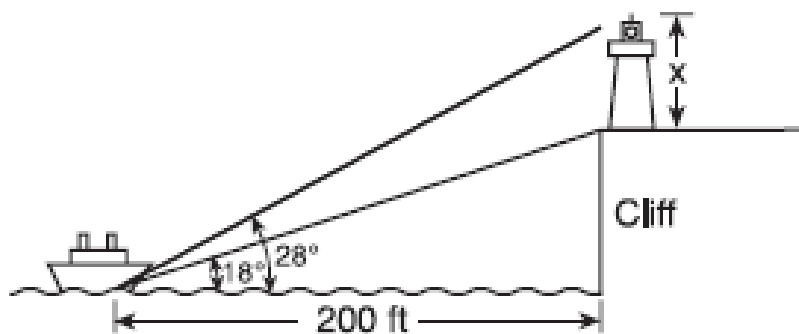
Attachments

Trig work sheet.doc