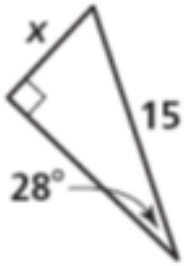
Trigonometry
Day 2

Need Class Sets (1/2 set for sleeves) for today:
Applications for Trig. – Angles of Elev. & Depr.

Warm Up

Find the value of x. Round to the nearest hundredth.

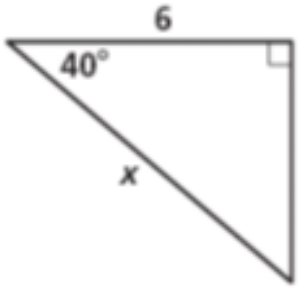
1.



X = 7.04

sin

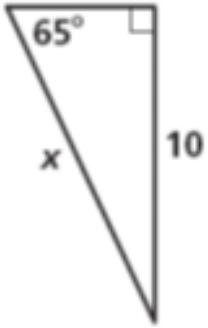
2.



X = 7.83

cos

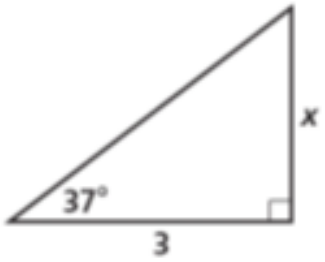
3.



X = 11.03

sin

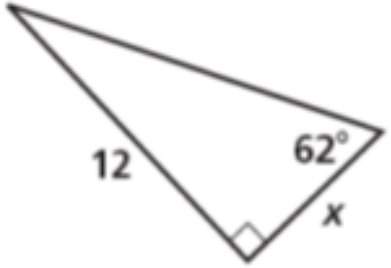
4.



X = 2.26

tan

5.



X = 6.38

tan

Homework

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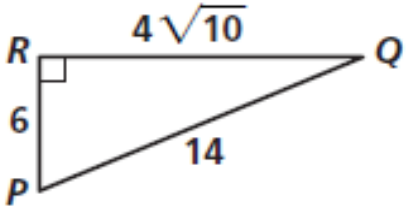
1. 3/4 3. 4/5 5. 15/17 7. 3/5

9.

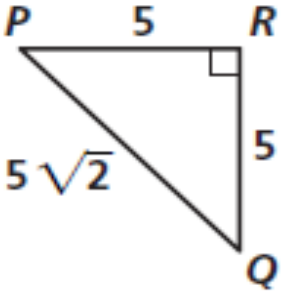


$$\sin(P) = \frac{4\sqrt{10}}{14} = \frac{2\sqrt{10}}{7}$$

$$\cos(P) = \frac{6}{14} = \frac{3}{7}$$

$$\tan(P) = \frac{4\sqrt{10}}{6} = \frac{2\sqrt{10}}{3}$$

11.



$$\sin(P) = \frac{5}{5\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{5\sqrt{2}}{10} = \frac{\sqrt{2}}{2}$$

$$\cos(P) = \frac{5}{5\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\tan(P) = \frac{5}{5} = 1$$

Homework Continued…

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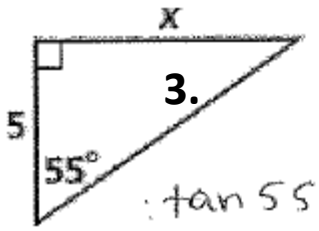
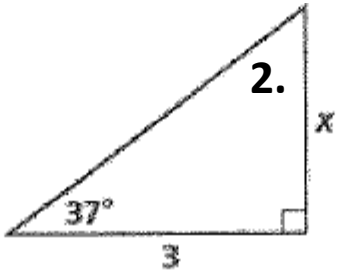
1.



$\tan 55 = \frac{x}{5}$

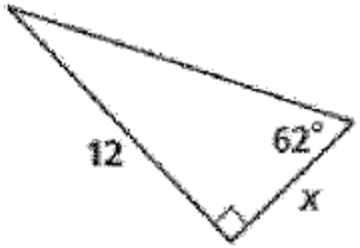
$x = 7.14$

2.



$\tan 37 = \frac{x}{3}$

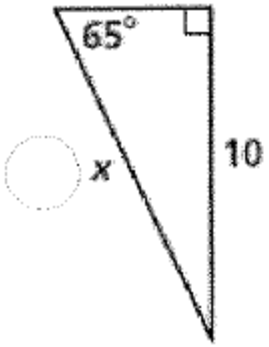
$x = 2.26$



$\tan 62 = \frac{12}{x}$

$x = 6.38$

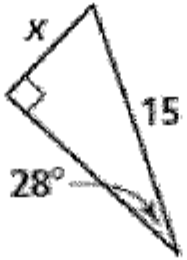
4.



$\sin 65 = \frac{10}{x}$

$x = 11.03$

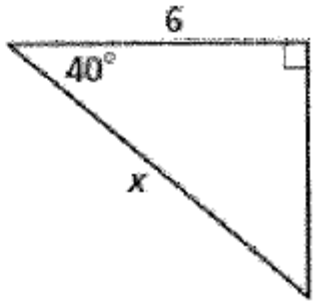
5.



$\sin 28 = \frac{x}{15}$

$x = 7.04$

6.



$\cos 40 = \frac{6}{x}$

$x = 7.83$

Homework Continued…

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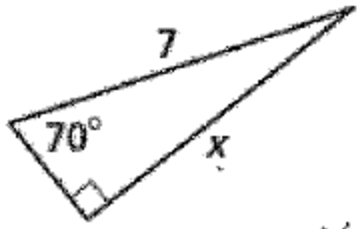
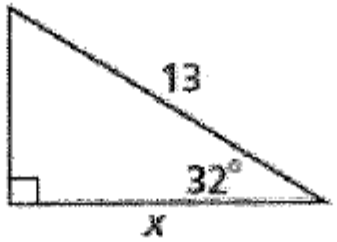
7.



$\sin 70 = \frac{x}{7}$

$x = 6.6$

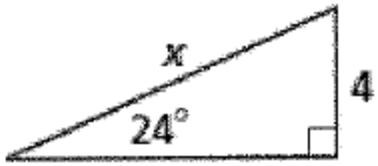
8.



$\cos 32 = \frac{x}{13}$

$x = 11.02$

9.



$\sin 24 = \frac{4}{x}$

$x = 9.83$

Tonight's Homework

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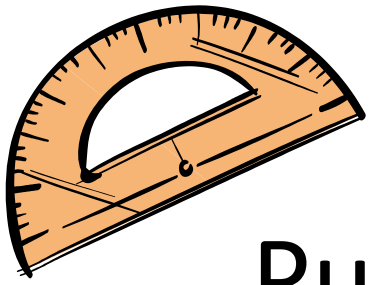


Clinometer

Put your clinometer in a safe place. We'll complete the lab using our clinometers on

Monday November 28.

NOTE: Be sure it has ALL its parts still **assembled** and ready BEFORE class! ☺

Finding missing ANGLES with the Trigonometric Ratios

To find missing angle measures,

1. Set up the trigonometric ratios.

2. Solve to isolate the trig. function

3. Then, you'll have to do the inverse of the trig. function to both sides.

NOTE: the inverse of the trig. function and the trig. function cancel each other out!

TIP: The inverse looks like the trig function with a -1 exponent.

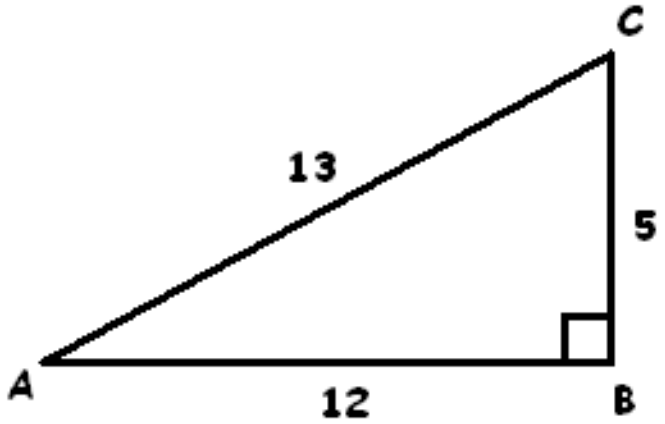
In your calculator to use inverse trig ratio, enter in the following, 2^{nd} "Trig. Function for the particular problem"

Finding angles using Tangent (TOA)

Ex 1: Find tan A and tan C.

$$\tan(A) = \frac{Opposite}{Adjacent} = \frac{5}{12}$$

$$\tan(C) = \frac{Opposite}{Adjacent} = \frac{12}{5}$$



Ex 2: Find A and C.

$$\tan(A) = \frac{5}{12}$$

$$\tan^{-1}(\tan(A)) = \tan^{-1}(\frac{5}{12})$$

$$A = 22.6°$$

$$\tan(C) = \frac{12}{5}$$

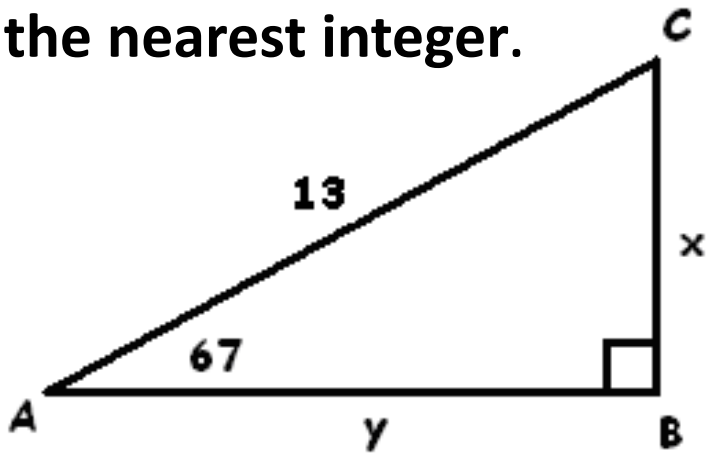
$$\tan^{-1}(\tan(C)) = \tan^{-1}(\frac{12}{5})$$

$$C = 67.4°$$

The Sine and Cosine Ratios

You Try!

Ex 3: Find x and y. **Round to the nearest integer.**



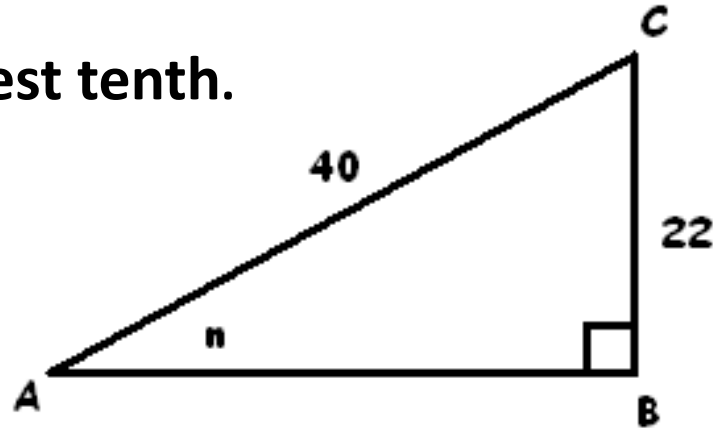
X = 12

(sin)

Y = 5

(cos)

Ex 4: Find n. **Round to the nearest tenth.**



n = 33.4°

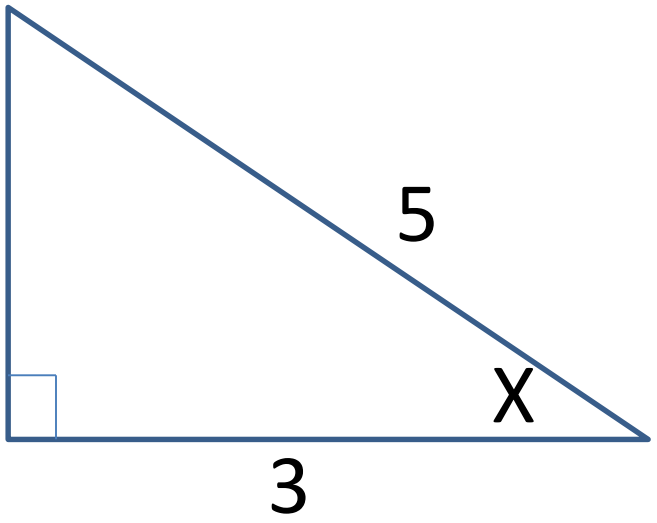
(sin)

Finding Missing Angles

Ex 5: Find x. Round to the nearest tenth.

x = 53.1°

(cos)

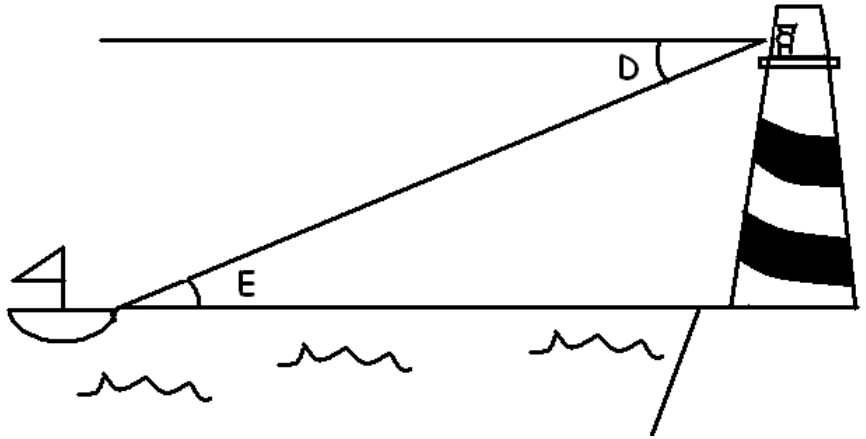


Applying Right Triangle Trigonometry

The top of a lighthouse is 50 feet above sea level. Suppose a lighthouse operator sees a sailboat at an angle of 22^{o} with a horizontal line straight out from his line of vision.

The angle between the horizontal line and the line of sight is called the **ANGLE OF DEPRESSION**

At the same time, a person in the boat looks up at an angle of **22 °** with the horizon and sees the operator in the lighthouse. This angle is called the **ANGLE OF ELEVATION**

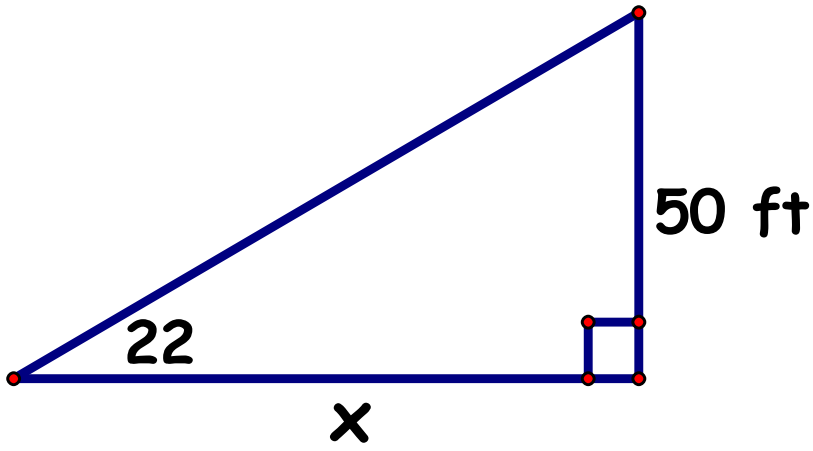


NOTE: The measure of the angle of depression = the measure of the angle of elevation.

The distance to the lighthouse from the sailboat can be found by

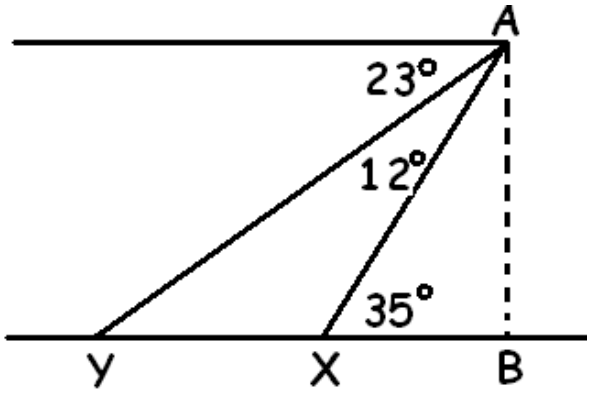
$$\tan 22 = \frac{50}{x}$$

$$x = \frac{50}{\tan 22}$$



$$x = 123.75\ ft$$

People at points X and Y see an airplane at A



The angle of elevation from X to A is 35 degrees **.**

The angle of depression from A to X is 35 degrees **.**

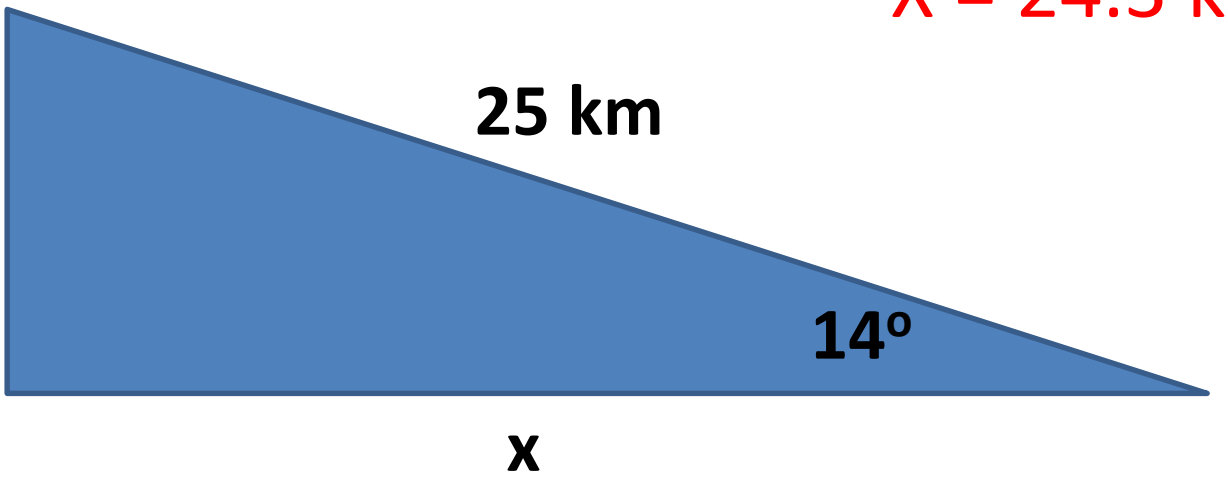
The angle of depression from A to Y is 23 degrees **.**

The angle of elevation from Y to A is 23 degrees **.**

You Try!

Ex. Karen drives 25 km up a hill that is a grade of 14. What horizontal distance has she covered?

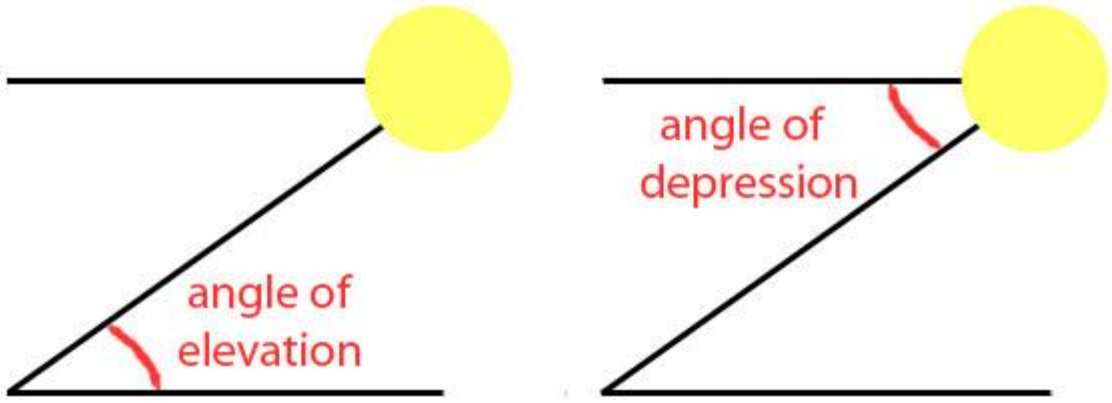
X = 24.3 km



Practice

Notes p. 5

Angle of Elevation and
Angle of Depression Practice



angle of elevation = angle of depression

Practice Notes p. 5

1) The leg opposite the 50 degree angle in a right triangle measures 8 meters. Find the length of the hypotenuse.

10.44 m (sin)

2) A cliff is 90 feet above the sea. From the cliff, the angle of depression to a boat measures 46 degrees. How far is the boat from the base of the cliff?

86.91 ft (tan)

3) A ramp is 60 feet long. It rises a vertical distance of 8 feet. Find the angle of elevation.

7.66° $(\sin^{-1})$

4) A tree casts a 50-foot shadow while the angle of elevation of the sun is 48. How tall is the tree?

55.53 ft (tan)

Triangle Trig Applications Practice

Practice Worksheet

- Applications for Trig – Angles of Elev. & Depr.

HINT: Draw a picture first!!

**Round to the nearest TENTH!

- Complete with a partner on a separate sheet of paper!

Triangle Trig Applications Answers

1. 25.9 m (tan)

2. 21.3 m (tan)

3. 51.4 m (sin)

4. 48.2^{o} ($\cos^{-1}$)

5. 134.7 m (sin)

6. 2400 m (cos)
   (2377.6 m)

7. 140 m (tan)
   (141.8 m)

Tonight's Homework

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