Lesson 9.6- SWBAT use trigonometry to solve real world applications.

Kick off-

1) Solve $\sqrt{5x+1} - 9 = 0$

2) Complete the square: $x^2 + 4x - 37 = 0$

3) Simplify: $\sqrt{50} - 6\sqrt{2} + \sqrt{6}$

4) Find $f^{-1}(x)$ of $f(x) = 2x - 7$

Apr 11-7:16 AM

SOH CAH TOA

$\sin\theta = \frac{opp}{hyp}$ $\cos\theta = \frac{adj}{hyp}$

$\tan\theta = \frac{opp}{adj}$

Pythagorean Theorem

$a^2 + b^2 = c^2$ (*c must be the hypotenuse)

- Use when solving for a side when there is no degrees in the triangle

Solving for a Side	Solving for an angle
① Pythagorean Thm $a^2+b^2=c^2$	Trig
② Trig *cross multiply	*2nd button

Apr 11-11:06 AM

Trigonometric Ratios

$\sin\theta = \frac{opp}{hyp}$ $\cos\theta = \frac{adj}{hyp}$ $\tan\theta = \frac{opp}{adj}$

Guided Examples:

1) A surveyor needs to determine the distance across the pond shown in the accompanying diagram. She determines that the distance from her position to point P on the south shore of the pond is 175 meters and the angle from her position to point X on the north shore is 32°. Set up the trig ratio you would use to determine the distance, PX, across the pond.

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2) The angle of elevation of the top of the building at a distance of 50 m from its foot on a horizontal plane is found to be 60 degrees. Find the height of the building.

3) A kite is flying 115 ft above the ground. The length of the string to the kite is 150 ft, measured from the ground. Find the angle, to the nearest degree, that the string makes with the ground.

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Objective: SWBAT solve real world applications with trig.

Kickoff

Complete your participation rubric and put it on my desk! Then take out your homework :)

Apr 12-6:57 AM

How to Solve a Word Problem:

1) Draw a triangle.
2) Label the triangle using the given information
3) Solve for the missing side or angle asked for. (Label this x)

4) A 15-foot ladder is placed on the side of a building. The ladder makes an angle of 71° with the ground. Find the trig ratio you would use to find how high up the wall the ladder will reach.

5) Michael and Jarrett are building a ramp for performing skateboard stunts. The ramp is 7 feet long and 3 feet high. Set up the trig ratio you would use to find the measure of the angle, x, that the ramp makes with the ground.

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6) An airplane rises at an angle of 12° with the ground. Set up the trig ratio you would use to find the distance it has flown when it has covered a horizontal distance of 1700 feet.

$\cos 12 = \frac{1700}{x}$ $x = 1738$

7) A building 14.5 m tall casts a shadow of 11.4 m along the level ground. At what angle do the rays of the sun hit the ground?

$\tan^{-1}(11.4/14.5) = 38.17 \rightarrow 38°$

8) A 5.2 m ladder leans against a wall. The bottom of the ladder is 1.9 m from the wall. What angle does the ladder make with the ground?

$\cos^{-1}(1.9/5.2) = 68.56 \rightarrow 69°$

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9) An observation tower is 75 m high. A support wire is attached to the tower 20 m from the top. If the support wire and the ground form an angle of 46 degrees, what is the length of the support wire, to the nearest tenth?

$a^2 + b^2 = c^2$ $\sqrt{x^2} = \sqrt{8775}$

$75^2 + x^2 = 120^2$ $x = 93.67$

$5625 + x^2 = 14400$ 93.7

$-5625 \quad -5625$

10) At a point 30 feet from the base of a tree, the angle formed with the ground looking to the top measures 53°. Find, to the nearest foot, the height of the tree.

$\tan 53 = \frac{x}{30}$

$x = 30 \tan 53$

$x = 39.81$ 39.8

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11) The angle of elevation of the top of a flagpole from a point on the ground 30 meters from the base of the flagpole is 18 degrees. What is the height of the flagpole, to the nearest meter?

12) An observer is 120 feet from the base of a television tower, which is 150 feet tall. Find, to the nearest degree, the angle of elevation of the top of the tower from the point where the observer is standing.

13) The sides of a rectangle are 25 cm and 8 cm. What is the measure, to the nearest degree, of the angle formed by the short side and a diagonal of the rectangle?

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14) A ladder, 500 cm long, leans against a building. If the angle between the ground and the ladder is 57 degrees, how far from the wall is the bottom of the ladder? Round the answer to the nearest tenth.

15) Henry is flying a kite. The kite string makes an angle of 43° with the ground. If Henry is standing 100 feet from a point on the ground directly below the kite, find the length of the kite string

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