

INVERSE Soh Cah Toa 25 APR 2017
 Starter Find the measure of the indicated angle.
 Round to the nearest tenth.

$x = \underline{\hspace{2cm}}$

$\sin X = \frac{36}{52} \frac{o}{h}$

$X = \sin^{-1}\left(\frac{36}{52}\right)$

$X = 43.8^\circ$

Angle of elevation Down-looking Up

Angle of depression Up-looking Down

the angle of elevation & the angle of depression are =.

Example 1 **Soh Cah Toa**

A man is standing on a cliff looking out at a ship at sea. The captain of the ship spots the man on the cliff and measures the angle of elevation to be 15° . The cliff is 50 feet high. How far is the ship from the base of the cliff?

$\tan 15 = \frac{50}{x}$

$x \tan 15 = 50$

$x = 186.6 \text{ ft}$

Example 2 Soh Cah Toa

A boy flies a kite at an angle of elevation of 18° . The boy has let out 300 feet of string. What is the maximum height of the kite?

Hyp 300ft string
height X opp. leg
 18°

$$\frac{\sin 18^\circ = \frac{X}{300}}{1} \quad \frac{0}{\#}$$

$$X = 300 \sin 18^\circ = 92.7 \text{ ft}$$

Example 3 $2.5(5280) = \#$
 $1 \text{ mi} = 5,280 \text{ ft.}$

A plane is coming in for a landing at the airport. The plane is at an altitude of 5000 feet. If the ground distance to the airport is 2.5 miles, what is the angle of depression to the airport from the plane? altitude = high elevation

5000 ft. opp. leg
2.5 mi = 13,200 ft adj. leg
X°
altitude = high elevation

Soh Cah Toa

$$\tan X = \frac{5000}{13,200} \quad \frac{0}{\#}$$

$$X = \tan^{-1} \left(\frac{5000}{13,200} \right)$$

$$X = 20.7^\circ$$

Name: _____ WORKSHEET: Trigonometric Word Problems

For each word problem 1-6: **Do # 1,2,& 3**

- 1) Make a sketch of each situation.
- 2) Solve by using either a SINE, COSINE, or TANGENT ratio.
- 3) Round all answers to the NEAREST HUNDRETH.

1. Duke is standing on a cliff that is 50 meters high. He looks down at an angle of 30° and sees a boat on the water. How far away is the boat from the foot of the cliff?
2. We need to attach a support wire to the top of Parkway West's flagpole, which is 24 feet high. The wire must make a 50° angle with the ground. How long must the wire be?
3. A ramp is 7 feet high and 20 feet long on the ground. What is the angle of elevation of the ramp?
4. A jet takes off at a 20° angle from the ground. The jet is traveling 300 ft/s. After 5 seconds, what is the height of the plane?
5. A park ranger is standing at the top of a 150 foot tower. Looking down at a 15° angle, he sees a forest fire. What is the distance of the fire from the base of the tower?
6. If Angel is standing 20 meters from the base of a tower, and she is looking up at the top at an angle of 60° , what is the height of the tower?