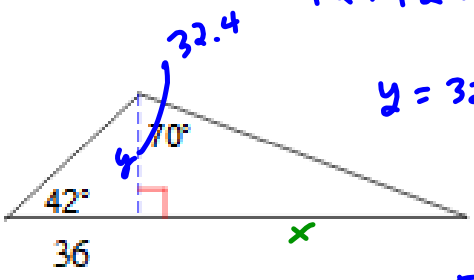
# Warm Up:

Solve for x.

1.




$\tan 42 = \frac{y}{36}$

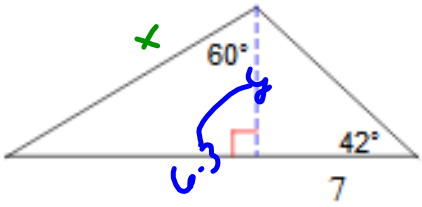
$y = 32.4$

$\tan 70 = \frac{x}{32.4}$

$32.4 \tan 70 = x$

$x = 89.0$

2.




$\tan 42 = \frac{y}{7}$

$7 \tan 42 =$

$\cos 60 = \frac{6.3}{x}$

$x = \frac{6.3}{\cos 60}$

$x = 12.6$

Learning Goal: Today I will learn about angles of elevation and depression.

Success Criteria: I am able to correctly label angles of elevation and depression.

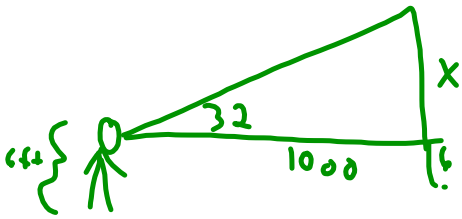
# 8.4 Angles of Elevation and Depression

Angle of Elevation

YS

The angle from a horizontal line up to an object or feature.

You sight a rock climber on a cliff at a 32 angle of elevation. Your eye level is 6 ft above the ground and you are 1000 feet from the base of the cliff. What is the approximate height of the rock climber from the ground?




$\tan 32 = \frac{x}{1000}$

$1000 \tan 32 = x$

624.9

+ 6

630.9 ft

Angle of Depression

Ys

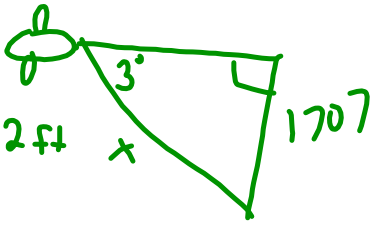
The angle from a horizontal line down to an object or feature.

To approach runway 17 of Ponca City Municipal Airport in Oklahoma, the pilot must begin a 3 degree decent starting at 1707 feet above the ground. To the nearest tenth of a mile, how far from the runway is the airplane at the start of this approach?

$\sin 3 = \frac{1707}{x}$

$x = \frac{1707}{\sin 3}$

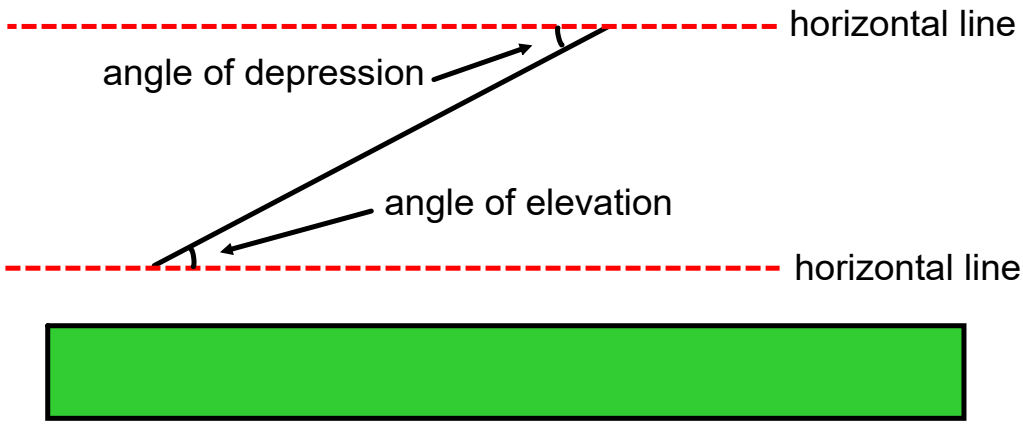
$x = 32614.2 \text{ ft}$



# Angle of Elevation and Depression

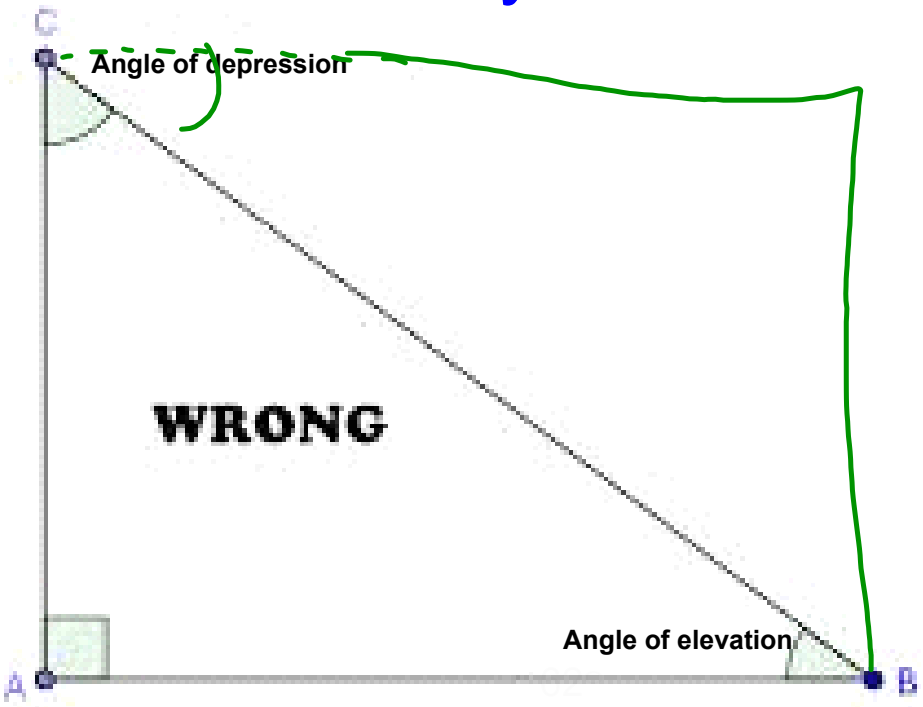
Angle of elevation - from horizontal line up

Angle of depression - from horizontal line down

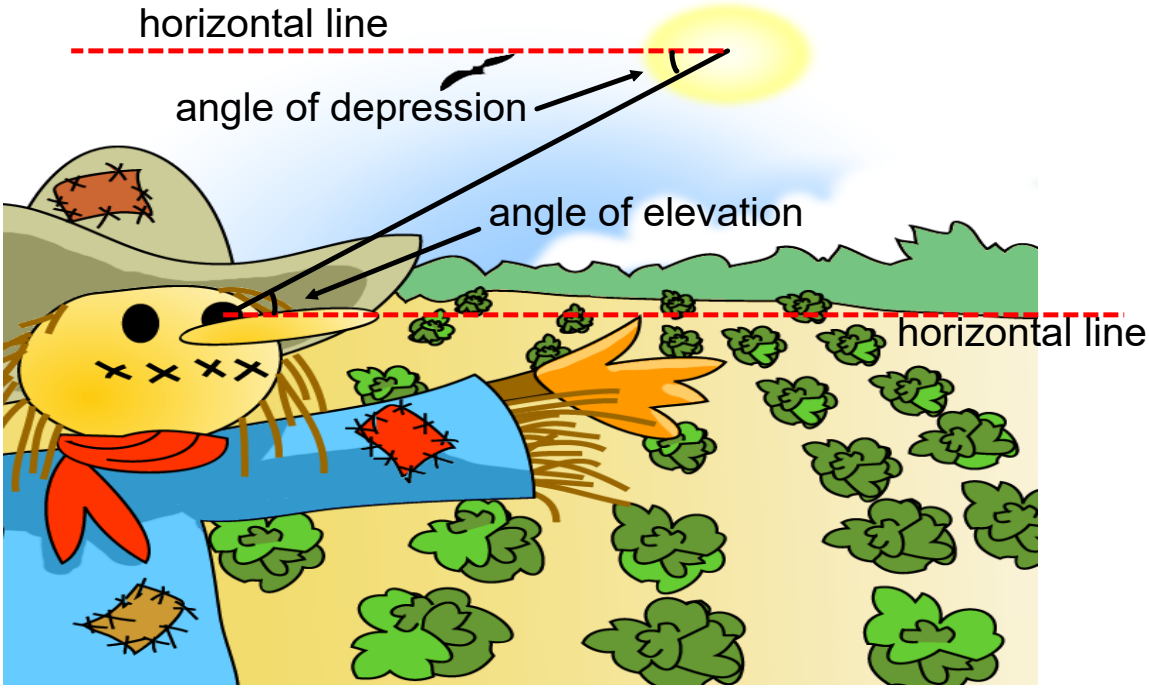



Alternate interior angles

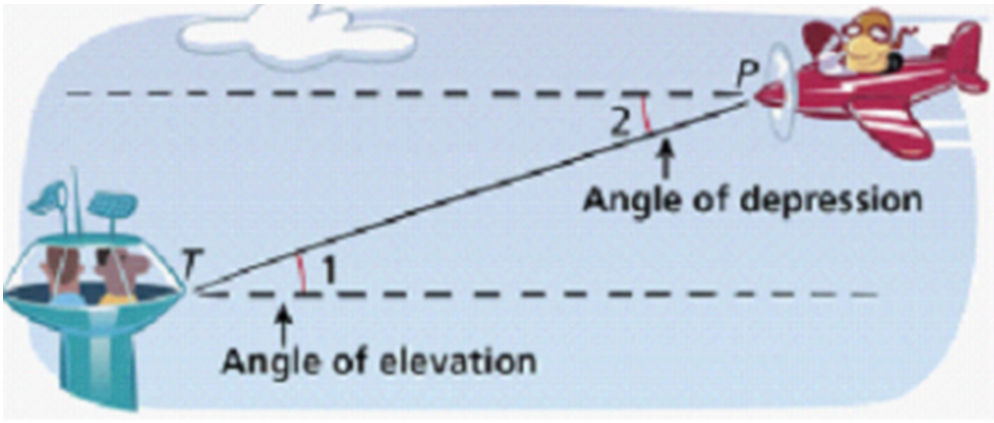
# Why?



# Angle of Elevation and Depression

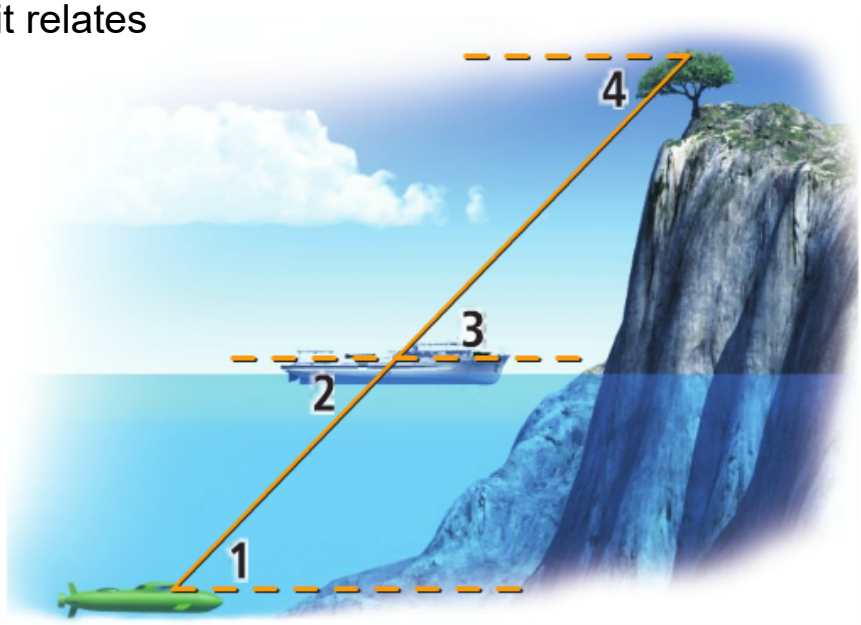


# Angle of Elevation and Depression



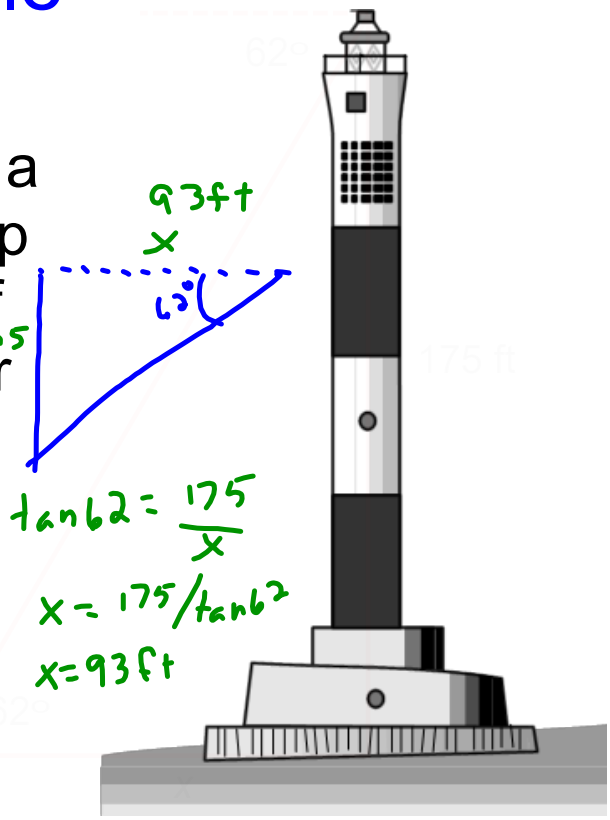
# Example

Describe each angle as it relates to the situation.



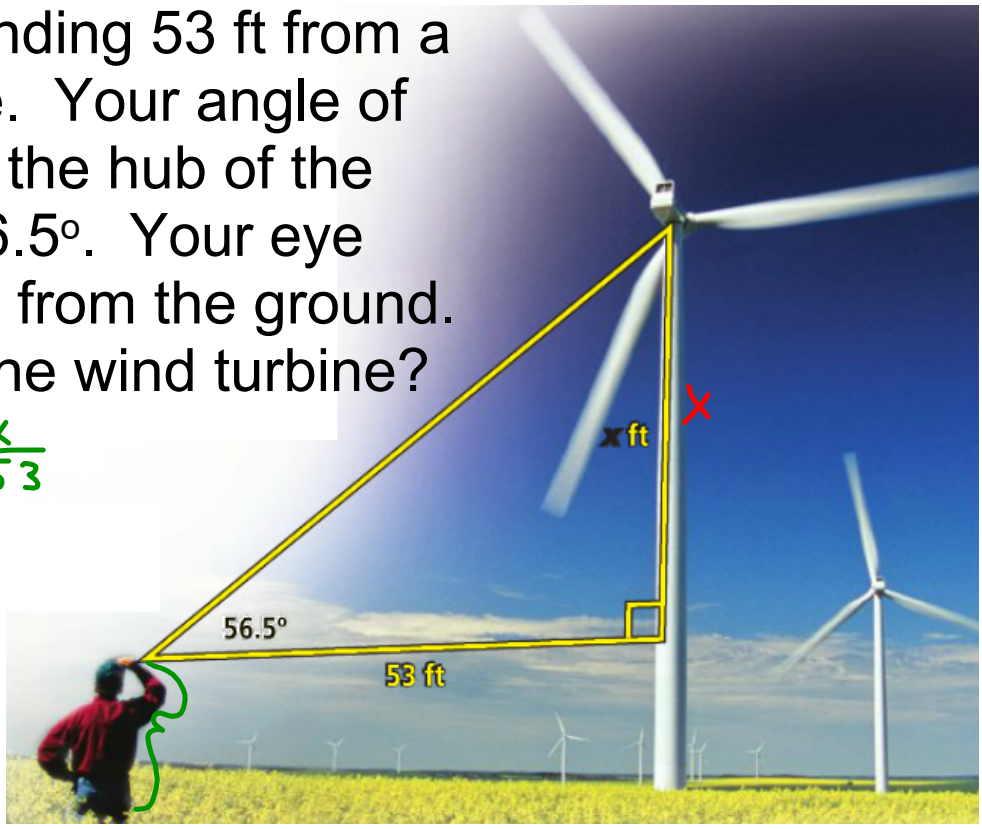
# Example

A rescue worker is located 175 ft above the ground in a lighthouse. He spots a ship on the water at an angle of depression of 62°. How far from the base of the lighthouse is the ship? Round to the nearest foot.



# Example

You are standing 53 ft from a wind turbine. Your angle of elevation to the hub of the turbine is 56.5°. Your eye level is 5.5ft from the ground. How tall is the wind turbine?




$\tan 56.5 = \frac{x}{53}$

$53 \tan 56.5 = x$

$80.1$

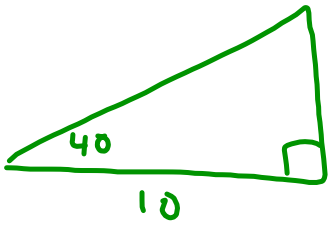
$+ \quad 5.5$

$85.6$ ft

Closure: Today I learned how to label the angle of elevation and depression.

Quiz on Block Day!

Angle of elevation 40°. Horizontal distance is 10ft. What is the vertical distance.



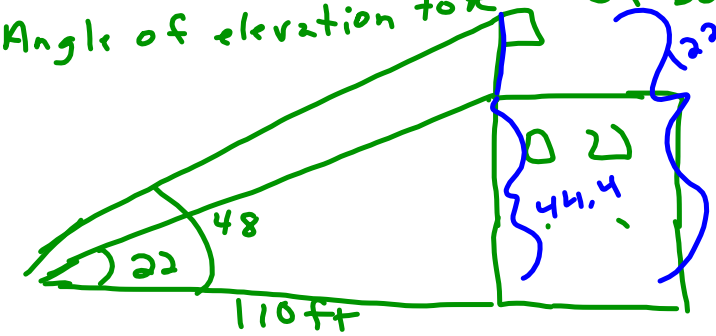

$x = 8.4$ ft

$\tan 40 = \frac{x}{10}$

$10 \tan 40 = x$

Angle of elevation to top of flag is 48°

Angle of elevation to top of building is 22°




What is the height of the flag pole

$\tan 22 = \frac{x}{110}$

$110 \tan 22 = x$

$x = 44.4$

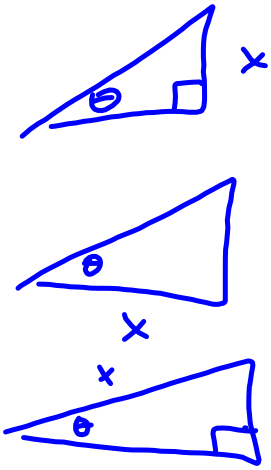
$\tan 48 = \frac{x}{110}$

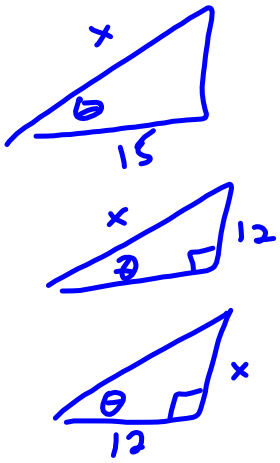
$110 \tan 48 = x$

$x = 122.2$

$122 - 44.4$

$77.8$ ft




$\sin 25 = \frac{x}{10}$

$\cos 23 = \frac{15}{x}$