

Learning Objective:	To: Use trigonometry to find angles of elevation and depression	Name:	
		Date:	

Do NOW Activity:

- 1 What is total of $200 + 5 + 0.5 + 0.06$?
- 2 **Work out** 75×28
- 3 **Simplify** $3a + a + a + b + 2b$
- 4 If $x = 4$ work out the value of $4x - 2$
- 5 **Round** 6450 correct to 1 significant figure

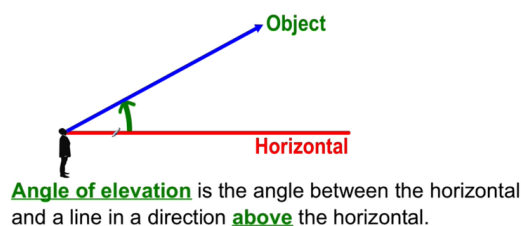
PRIOR KNOWLEDGE CHECK:

1. I can identify and use the correct trigonometric ratio to find lengths and angles.

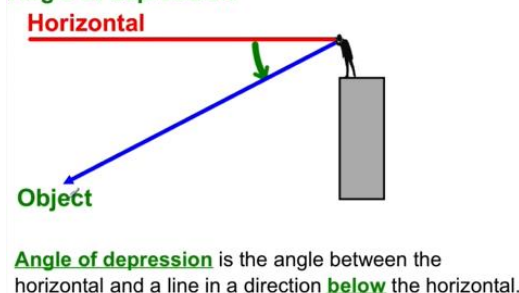
THE MAIN EVENT

FACTS

Angle of elevation



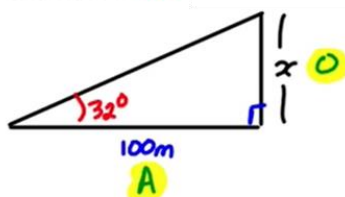
Angle of depression



EXAMPLE #1:

From a distance of 100m the angle of elevation to the top spire of a tower is 32° . How high is the tower?

$S^{\circ}HC^{\wedge}HT^{\circ}A$



$S^{\circ}HC^{\wedge}HT^{\circ}A$

$$\tan \theta = \frac{O}{A}$$

$$\tan 32 = \frac{x}{100}$$

$$100 \tan 32 = x$$

$$x = 62.486...$$

$$\text{Heig} = 62.5\text{m}$$

From the top of a tower an **object** which is 92m away from the base of the tower is at an angle of depression from the tower of 37° . How high is the tower (1DP)?

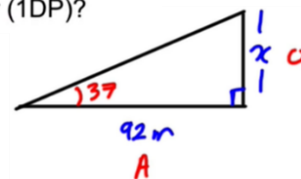
$$\tan \theta = \frac{O}{A}$$

$$\tan 37 = \frac{x}{92}$$

$$92 \tan 37 = x$$

$$x = 69.326$$

$$\text{Height} = 69.3\text{m}$$



PRACTICE #1:

1) A student can see a tower from the closet point of the soccer field at his high school. The edge of the soccer field is about 105m from the water tower and the water tower stands at a height of 51m. What is the angle of elevation from the student's feet?

2) Find the angle of elevation of the sun when a 8.5 meter flagpole cast at 23.5 meter shadow

3) A 20 foot ladder leans against a wall so that the base of the ladder is 8 feet from the base of the building. What is the ladder's angle of elevation?

4) An airplane rises vertically 1000 feet over a horizontal distance of 5280 feet. What is the angle of elevation of the airplane's path?

5) A sledding run is 280 yards long with a vertical drop of 18.5 yards. What is the angle of depression of the run?

PRACTICE #2:

6) A golfer is standing at the tee, looking up to the green on a hill. If the tee is 38 yards lower than the green and the angle of elevation is 15° , find the distance from the tee to the hole.

7) A roofer props a ladder against a wall so that the base of the ladder is 4 feet away from the building. If the angle of elevation from the bottom of the ladder to the roof is 63° , how long is the ladder?

8) The tailgate of a moving van is 4.25 feet above the ground. A loading ramp is attached to the rear of the van at an incline of 12° . What is the length of the ramp?

9) At the circus, an acrobat is standing on a platform that is 27 feet off the ground when he sees a peanut on the ground below. How far is the peanut from the base of the platform if the angle of elevation from the peanut to the top of the acrobat's platform is 25° ?

10) The top of a signal tower is 135 meters above sea level. The angle of depression from the top of the tower to a passing ship is 20° . How many meters from the foot of the tower is the ship?

APPLICATION

Question 1: Two small boats are 28m apart.
The angle of elevation of the boats to the top of the lighthouses are 24° and 40° respectively.

Calculate the height of the lighthouse.

