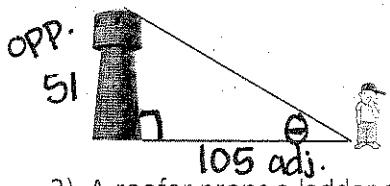
Notes: Angles of Elevation & Depression
a.k.a. Trig Word Problems

Name _____

Angles of Elevation and Depression – round to the nearest hundredth.
SHOW ALL WORK

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 105 feet from the water tower and the water tower stands at a height of 51 feet. What is the angle of elevation from the student's feet?



$\tan\theta = \frac{51}{105}$

$\theta = \tan^{-1}\left(\frac{51}{105}\right)$

$\theta = 25.91°$

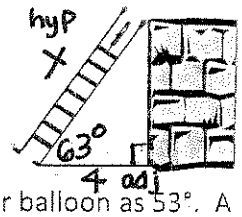
2) A roofer props a ladder against a wall so that the base of the ladder is 4 feet away from the building. If the angle of elevation from the bottom of the ladder to the roof is 63°, how long is the ladder?

$\cos(63) = \frac{4}{x}$

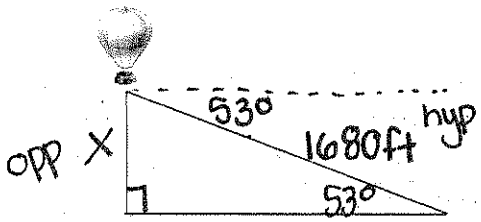
$x\cos(63) = 4$

$x = \frac{4}{\cos(63)}$

$x = 8.81\text{ft}$



3) A meteorologist measures the angle of depression of a weather balloon as 53°. A radio signal from the balloon indicates that it is 1680 feet from his receiver. How high is the weather balloon from the ground?

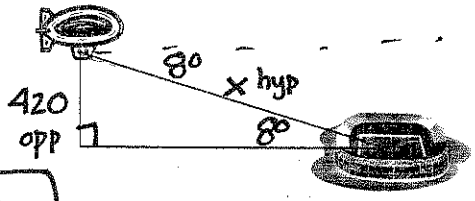


$\frac{\sin(53)}{1} = \frac{x}{1680}$

$x = 1680\sin(53)$

$x = 1{,}341.71\text{ft}$

4) A blimp is flying to cover a football game. The pilot sights the stadium at an 8° angle of depression. The blimp is flying at an altitude of 420m. How many meters is the blimp from the stadium?



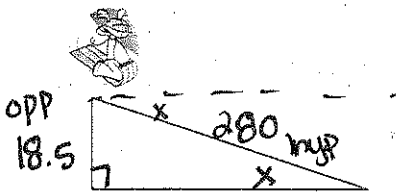
$\sin(8) = \frac{420}{x}$

$x\sin(8) = 420$

$x = \frac{420}{\sin(8)}$

$x = 3{,}017.82\text{m}$

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?



$\sin(x) = \frac{18.5}{280}$

$x = \sin^{-1}\left(\frac{18.5}{280}\right)$

$x = 3.79°$

More Examples:

Name_____

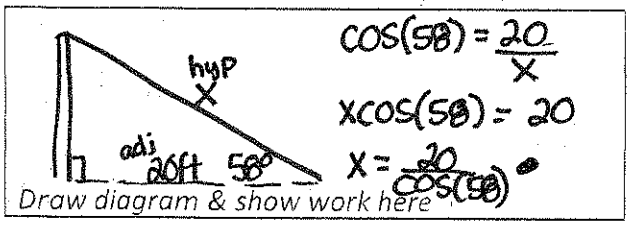
Angles of Elevation and Depression PART 2

Draw a diagram, SHOW ALL WORK, and tell whether each is an example of elevation or depression. Round to the nearest hundredth.

1) A string of lights is attached from the top of a pole and creates a 58° angle with the ground. From the stake to the bottom of the pole measures 20 feet. How long is the string of lights?

ELEVATION OR DEPRESSION???

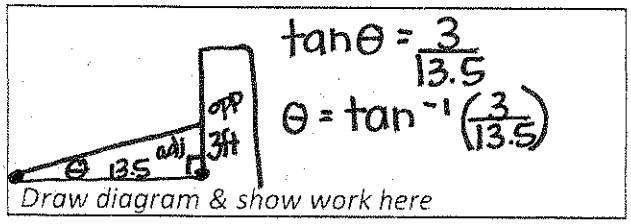
$x = 37.74$ ft



2) The front of a wheelchair ramp is 13.5 feet from the building and reaches a height of 3 feet off of the ground. Find the angle that the ramp makes with the ground.

ELEVATION OR DEPRESSION???

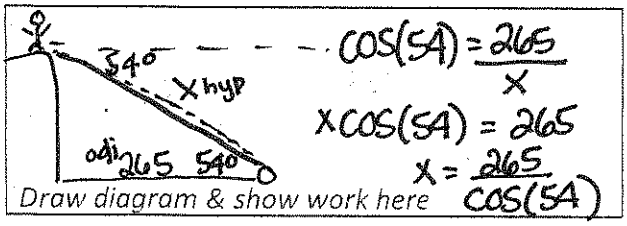
$\theta = 12.53°$



3) Josiah is standing on top of a cliff and throws a rock off of a cliff. The rock lands 265 feet away from the base of the cliff. If Josiah creates an angle of 54° with a line parallel to the ground, how far is he away from the rock.

ELEVATION OR DEPRESSION???

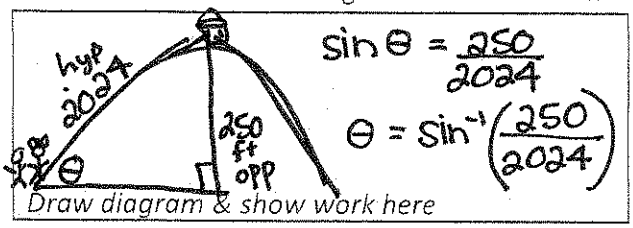
$x = 450.84$ ft



4) In order to reach the top of a hill which is 250 feet high, Jack and Jill must travel 2024 feet up the hill to reach their pail of water. Find the number of degrees contained in the angle that is created by the hill.

ELEVATION OR DEPRESSION???

$\theta = 7.10°$



5) A fireman leans his ladder against the wall and makes an angle of 74° with the ground. If the foot of the ladder is 6.5 feet away from the wall, how high on the wall does the ladder reach?

ELEVATION OR DEPRESSION???

$x = 22.67$ ft