Date: _____

Trigonometry Word Problems

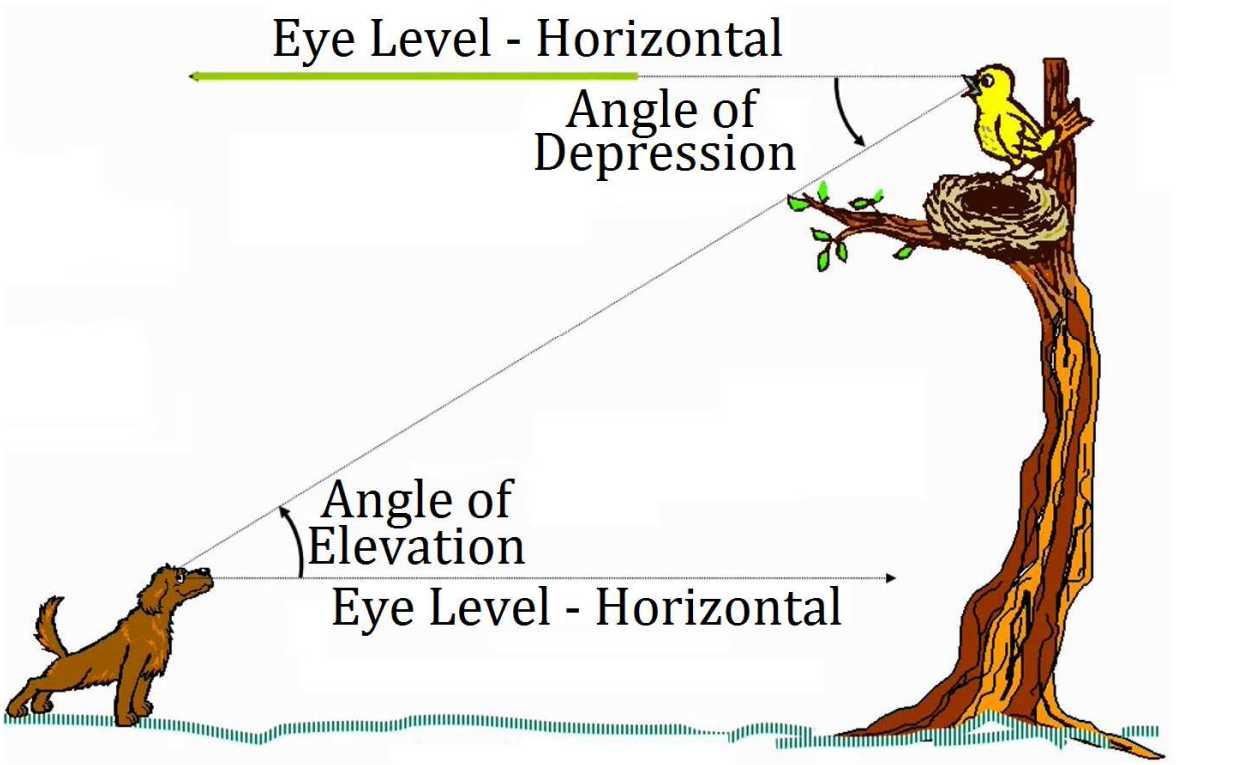
Process

1) Draw a diagram if one is not given. DO NOT skip this step!
2) Label the diagram with all important info.
3) Mark the given angle, name the sides and choose the right trig ratio.
4) Write an equation to represent the problem.
5) Solve for the missing value.
6) Write a concluding statement.

Important Vocabulary

Angle of Elevation:
The angle between the horizontal and the line of sight up to an object.

Angle of Depression:
The angle between the horizontal and the line of sight down to an object.



Example 1
Evelyn Granville, who is 1.5 m tall, is standing 20 m from the base of a building. She sights the top of the building with an angle of elevation of 58°. Find the height of the building.

Example 2
When the sun's angle of elevation is 38°, a building casts a shadow of 48 m. How high is the building?

Example 3
From the top of a 20 m tall lighthouse, a sailboat is sighted at an angle of depression of 40°. How far from the lighthouse is the boat?

Example 4
A video camera is mounted on the top of a 120 m tall building. When it tilts down 36° from the horizontal, it views the base of another building. When it tilts up 47° from the horizontal, it views the top of the same building.

a) How far apart are the two buildings?
b) How tall is the building viewed by the camera?

Example 5
A pilot heading north spots two fires. The fire to the east is found at an angle of depression of 47°. The fire to the west is found at an angle of depression of 38°. Given that the plane's elevation is 2400 m, determine the distance between the two fires.

Homework

1. From the top of a cliff 88 m above the canyon floor, the angle of depression to the edge of the river is 37°. How far away is the river from the cliff top the nearest metre.

2. From the window of one building, the angle of elevation of the top of a second building is 38°. From the same window, the angle of depression of the bottom of the second building is 51°. Find the height of the second building if the two buildings are 42 m apart.

3. Two wires, 20 m long and 15 m long, are fastened to a pole at different points and then secured to the ground at the same spot. If the 20 m wire makes an angle of 60° with the ground and the 15 m wire makes an angle of 50° with the ground, find the distance between the points of attachment on the pole.

4. A flagpole is on the top of a building. From a point 120 m from the foot of the building, the angles of elevation of the top and bottom of the flagpole are 49° and 46° respectively. Find the height of the building and the flagpole.

5. From the top of a cliff 185 m high, the angles of depression to two buoys in the same line of sight on the water are 63° and 75°. How far apart are the buoys?

6. Jack is on one side of an 88 metre deep canyon and Jill is on the other. Jack can see the trail guide at an angle of depression of 45° and Jill can see the trail guide at an angle of depression of 60°. How far apart are they from each other?

Answers

1. 117 m
2. 85 m
3. 6 m
4. Building – 124 m Flagpole – 14 m
5. 44.69 m
6. 139 m