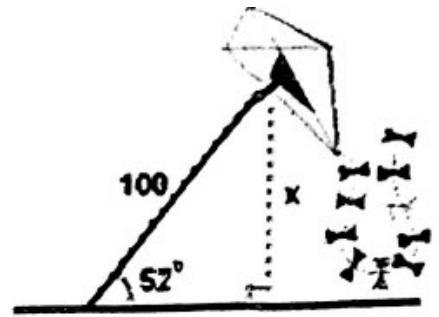


Angle of Elevation & Depression Worksheet #3

Find all values to the nearest tenth.

1. A man flies a kite with a 100 foot string. The angle of elevation of the string is 52° . How high off the ground is the kite?

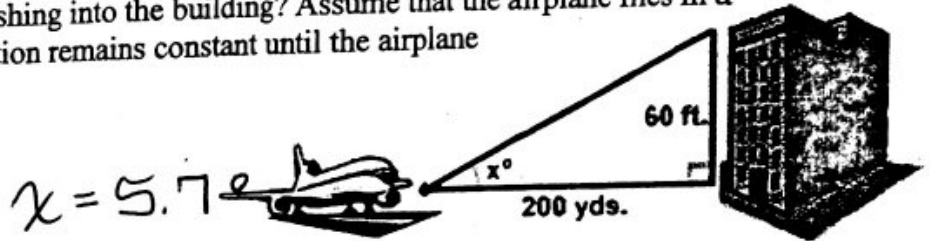


$$x = 78.8 \text{ ft}$$

2. From the top of a vertical cliff 40 m high, the angle of depression of an object that is level with the base of the cliff is 34° . How far is the object from the base of the cliff?

$$x = 59.3 \text{ m}$$

3. An airplane takes off 200 yards in front of a 60 foot building. At what angle of elevation must the plane take off in order to avoid crashing into the building? Assume that the airplane flies in a straight line and the angle of elevation remains constant until the airplane flies over the building.



$$x = 5.7^\circ$$

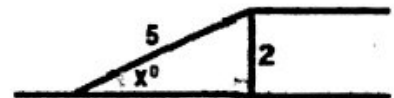
4. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall?

$$\theta = 68.2^\circ$$

5. A person stands at the window of a building so that his eyes are 12.6 m above the level ground. An object is on the ground 58.5 m away from the building on a line directly beneath the person. Compute the angle of depression of the person's line of sight to the object on the ground.

$$\theta = 12.2^\circ$$

6. A ramp is needed to allow vehicles to climb a 2 foot wall. The angle of elevation in order for the vehicles to safely go up must be 30° or less, and the longest ramp available is 5 feet long. Can this ramp be used safely?



$$\angle x = 23.6^\circ$$

Yes \angle of elevation is $< 30^\circ$

7. A wire attached to the top of a pole reaches a stake in the ground 20 feet from the foot of the pole and makes an angle of 58° with the ground. Find the length of the wire.

$$x = 37.7 \text{ ft}$$

8. Henry is flying a kite. The kite string makes an angle of 43° with the ground. If Henry is standing 100 feet from a point on the ground directly below the kite, find the length of the kite string.

$$x = 136.7 \text{ ft}$$

9. A 25 foot ladder leans against a building. The ladder's base is 13.5 feet from the building. Find the angle which the ladder makes with the ground.

$$\angle \theta = 57.3^\circ$$

10. In order to reach the top of a hill which is 250 feet high, one must travel 2000 feet straight up a road which leads to the top. Find the number of degrees contained in the angle which the road makes with the horizontal.

$$\angle \theta = 7.2^\circ$$

11. A ladder leans against a building. The top of the ladder reaches a point on the building which is 18 feet above the ground. The foot of the ladder is 7 feet from the building. Find the measure of the angle which the ladder makes with the level ground.

$$\angle \theta = 68.7^\circ$$

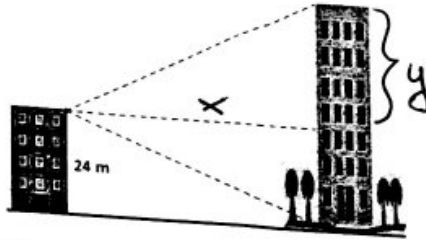
NAME: _____

For each problem, first complete the diagram and then solve for the requested information.

1. From an apartment window 24 m above the ground, the angle of depression of the base of a nearby building is 38° and the angle of elevation of the top is 63° . Find the height of the nearby building (to the nearest meter).

$$x = 30.7 \text{ m}$$

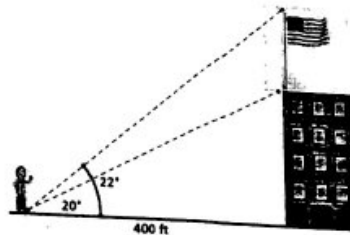
$$y = 60.3 \text{ m}$$



2. A flagpole is at the top of a building. 400 ft from the base of the building, the angle of elevation of the top of the pole is 22° and the angle of elevation of the bottom of the pole is 20° . Determine the length of the flagpole (to the nearest foot).

height of flag

16 ft

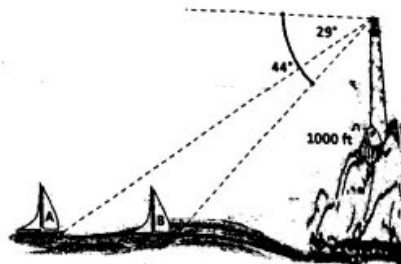


3. From a lighthouse 1000 ft above sea level, the angle of depression to a boat (A) is 29° . A little bit later the boat has moved closer to the shore (B) and the angle of depression measures 44° . How far (to the nearest foot) has the boat moved in that time?

$$x = 1035.53 \text{ ft}$$

$$x_2 = 1804.05 \text{ ft}$$

$$= 768.52 \text{ ft apart}$$



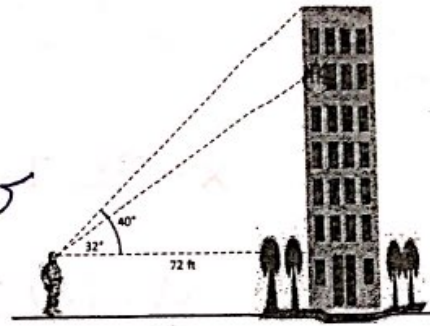
4. Two trees are 100 m apart. From the exact middle between them, the angles of elevation of their tops are 12° and 16° . How much taller is one tree than the other (2 decimal places)?

One is ~ 3.71 ft taller

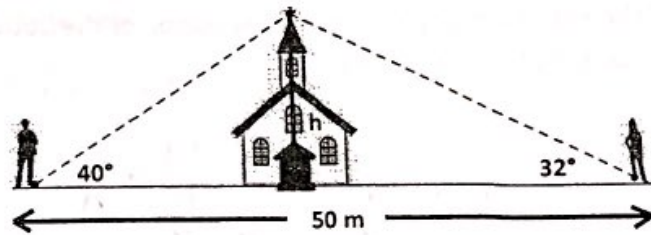


5. A firefighter on the ground sees the fire break through a window. The angle of elevation to the windowsill is 32° . The angle of elevation to the top of the building is 40° . If the firefighter is 72 ft from the building, what is the distance from the roof to the window sill?

15.4 ft from the roof to the window



6. Jack and Jill are on either side of the church and 50 m apart. Jack sees the top of the steeple at 40° and Jill sees the top of the steeple at 32° . How high is the steeple?



$$h = 17.91 \text{ m}$$

7. Jack and Jill are 20 m apart. Jack sees the top of the building at 30° and Jill sees the top of the building at 40° . What is the height of building?

$$h = 37.01 \text{ m}$$

