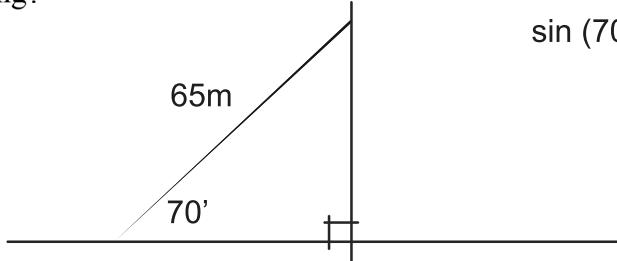


Angle of Elevation & Depression Trig Worksheet***Draw and label a picture for each problem**

1. Brian's kite is flying above a field at the end of 65 m of string. If the angle of elevation to the kite measures 70° , and Brian is holding the kite 1.2 m off the ground. How high above the ground is the kite flying?



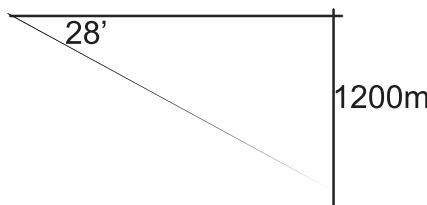
$$\sin(70) = 0.94 \quad \text{sin} = \text{opposite/hypotenuse}$$

$$0.94 = ?/65$$

$$65 \cdot 0.94 = 61.1$$

$$61.1 + 1.2 = \underline{\underline{62.3m}}$$

2. From an airplane at an altitude (height) of 1200 m, the angle of depression to a rock on the ground measures 28° . Find the distance from the plane to the rock.



$$\sin(28) = 0.47 \quad \text{sin} = \text{opposite/hypotenuse}$$

$$0.47 = 1200/?$$

$$1200/0.47 = \underline{\underline{2553.19m}}$$

3. From a point on the ground 12 ft from the base of a flagpole, the angle of elevation of the top of the pole measures 53° . How tall is the flagpole?

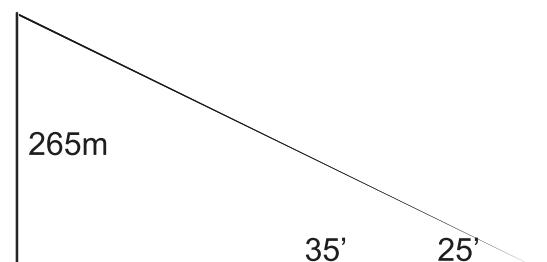


$$\tan(53) = 1.33 \quad \tan = \text{opposite/adjacent}$$

$$1.33 = 12\text{ft}/?$$

$$12/1.33 = \underline{\underline{9.02ft}}$$

4. From a plane flying due east at 265 m above sea level, the angles of depression of two ships sailing due east measure 35° and 25° . How far apart are the ships?



$$\tan(35) = 0.70$$

$$\tan = \text{opposite/adjacent}$$

$$0.70 = 265/?$$

$$265/0.70 = 378.57$$

$$\tan(25) = 0.47$$

$$\tan = \text{opposite/adjacent}$$

$$0.47 = 265/?$$

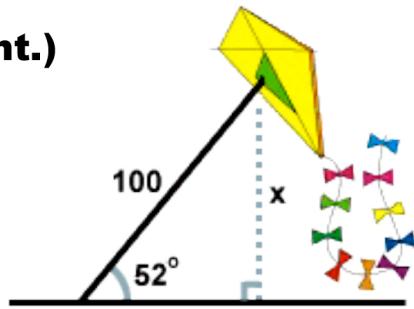
$$265/0.47 = 563.83$$

$$563.83 - 378.57 = \underline{\underline{185.26m}}$$

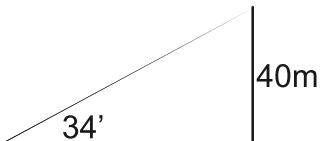
Angle of Elevation & Depression Worksheet (Cont.)**Find all values to the nearest tenth.**

5. 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?

$$\sin(52) = 0.78 \quad 0.78 = 100/? \quad 100/0.78 = 128.20\text{ft}$$



6. 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?



$$\tan(34) = 0.67 \quad 40/0.67 = 59.70\text{m}$$

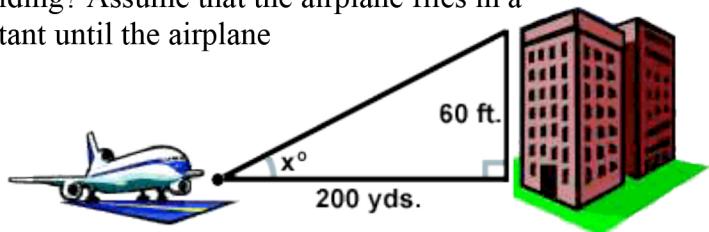
$$0.67 = 40/?$$

7. 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.

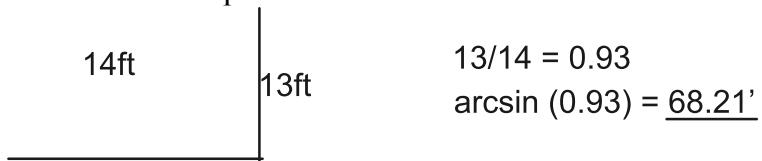
$$60\text{ft} = 20 \text{ yards}$$

$$20/200 = 0.1$$

$$\arctan(0.1) = 5.71'$$



8. 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?



$$13/14 = 0.93$$

$$\arcsin(0.93) = 68.21'$$

9. 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.



$$12.6/58.5 = 0.21$$

$$\arctan(0.21) = 11.86'$$

10. 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?

$$2/5 = 0.4 \quad \arcsin(0.4) = 23.57' \quad \text{YES}$$

