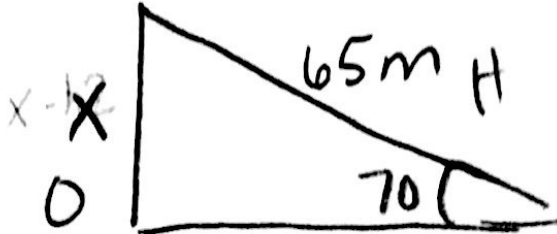


Day 8: Angle of Elevation and Depression

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?

(A)

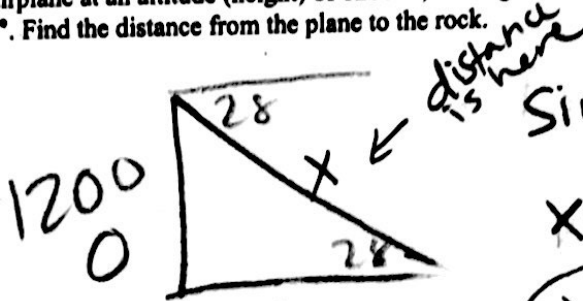


$$\sin(70) = \frac{x}{65}$$

$$x = 61.08 + 1.2$$

$$x = 62.28 \text{ m}$$

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.



$$\sin(28) = \frac{1200}{x}$$

$$x = 1200 / \sin(28)$$

$$x = 2556.07$$

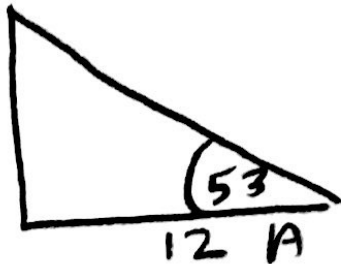
3. From a point on the ground 12 ft from the base of a flagpole, the angle of elevation of the top of the pole measures 53°. How tall is the flagpole?

$$\tan(53) = \frac{x}{12}$$

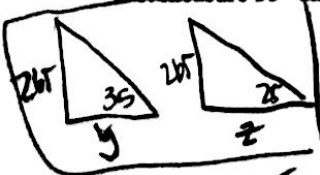
$$x = 12 \tan(53)$$

$$x = 15.92 \text{ ft}$$

Pictures separate for reference!



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?



$$\tan(25) = \frac{265}{z}$$

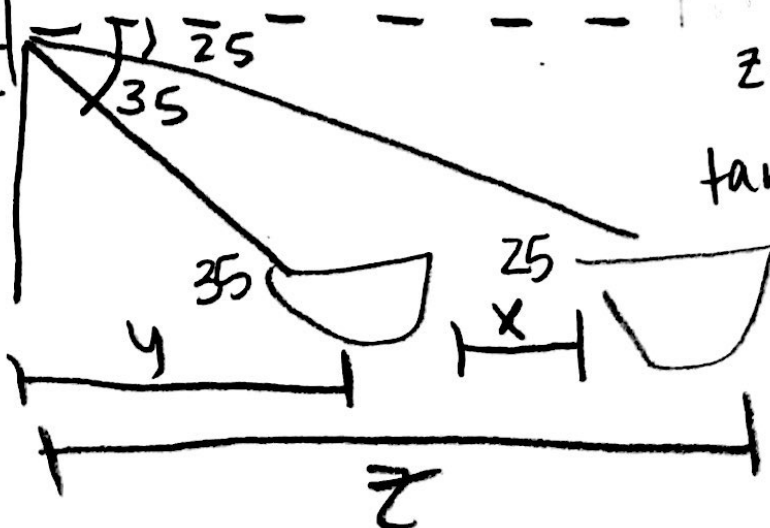
$$z = 568.29$$

$$\tan(35) = \frac{265}{y}$$

$$y = 378.46$$

$$x = z - y$$

$$x = 189.84 \text{ m}$$

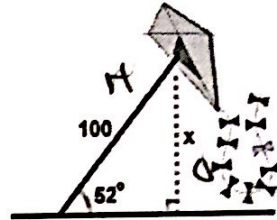


1. set.

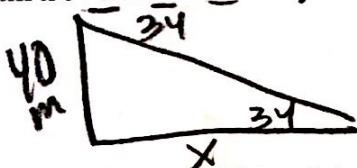
5. A man lies a kite with a 100 foot string. The angle of elevation of the string is 52° . How high off the ground is the kite?

$$\sin(52) = \frac{x}{100}$$

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



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?



$$\tan(34) = \frac{40}{x}$$

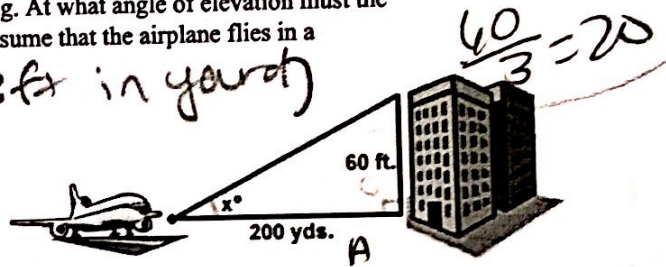
$$x = 59.3 \text{ m}$$

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.

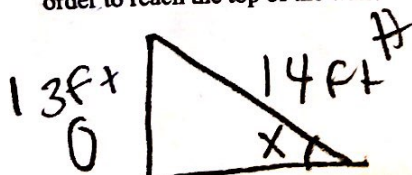
$$\tan(x) = \frac{20}{200}$$

$$x = 5.71^\circ$$

(3 ft in yards)



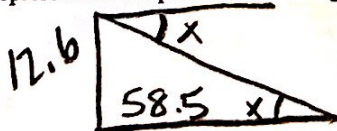
8. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall?



$$\sin(x) = \frac{13}{14}$$

$$x = 68.21^\circ$$

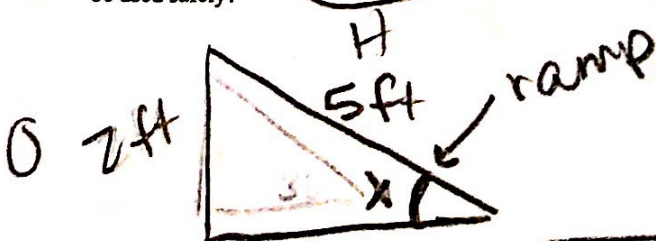
9. A person stands at the window of a building so that his eyes are 12.6 m above the level ground. An object is on the ground 58.5 m away from the building on a line directly beneath the person. Compute the angle of depression of the person's line of sight to the object on the ground.



$$\tan(x) = \frac{12.6}{58.5}$$

$$x = 12.15^\circ$$

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?



$$\sin(x) = \frac{2}{5}$$

Yes! less than 30° | $x = 23.58^\circ$