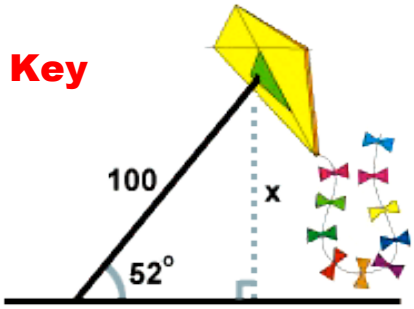
Unit 6 Activity #1

Angle of Elevation & Depression Worksheet Answer Key

Find all values to the nearest tenth.



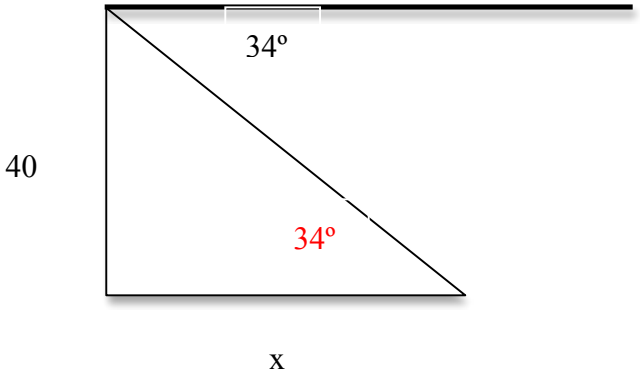
1. A man flies a kite with a 100 foot string. The angle of elevation of the string is 52°. How high off the ground is the kite?

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

$$100 \bullet \sin 52 = x$$

$$x \approx 78.8 \, feet$$

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?

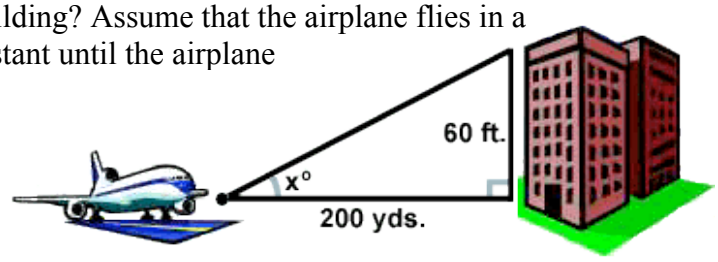


$$\tan 34 = \frac{40}{x}$$

$$x \bullet \tan 34 = 40$$

$$x \approx 59.3 \ \ m$$

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.



$$\tan x = \frac{60}{200}$$

$$\tan^{-1}\left(\frac{60}{200}\right) = x$$

$$x \approx 16.7^{\circ}$$

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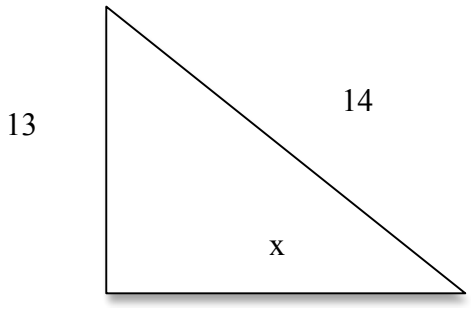
4. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall?



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

$$\sin^{-1}\left(\frac{13}{14}\right) = x$$

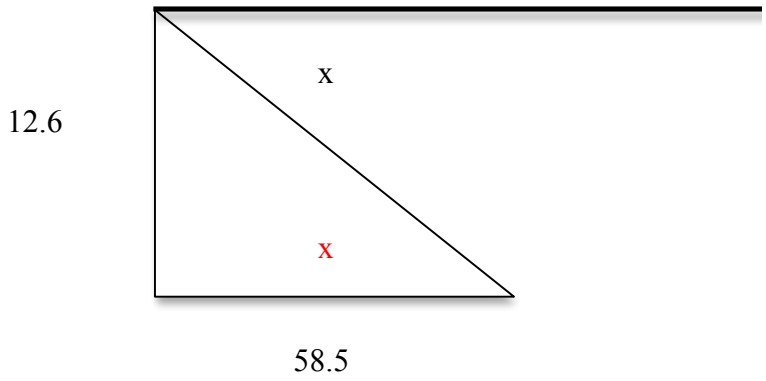
$$x \approx 68.2°$$

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.

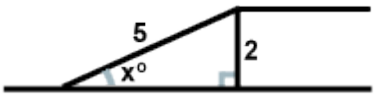
$$\tan x = \frac{12.6}{58.5}$$

$$\tan^{-1}\left(\frac{12.5}{58.5}\right) = x$$

$$x \approx 12.1°$$



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? **yes**



$$\tan x = \frac{2}{5}$$

$$\tan^{-1}\left(\frac{2}{5}\right) = x$$

$$x \approx 21.8°$$