

p. 78-79 Angle of Elevation & Depression 13.1

Angle of Elevation and Depression

LINE OF SIGHT: eye level.

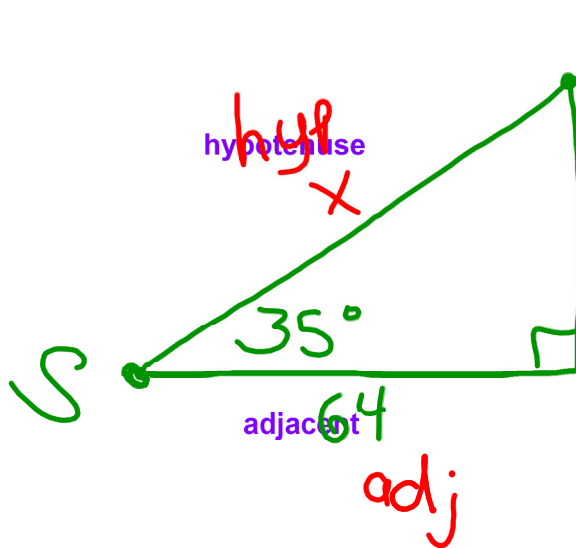
ANGLE OF ELEVATION: seeing an object above your line of sight.

ANGLE OF DEPRESSION: seeing an object below your line of sight.



EX 1

Superman is standing 64 meters from the base of a bank where the villainous Lex Luther is about to fly away with a stash of money he just stole. Superman's angle of elevation to the top of the building is 35° . Find the distance Superman needs to exert his heat vision to stop Lex Luthor from getting away.



S O C A T O
H C H T A

$$\cos 35^\circ = \frac{64}{x}$$

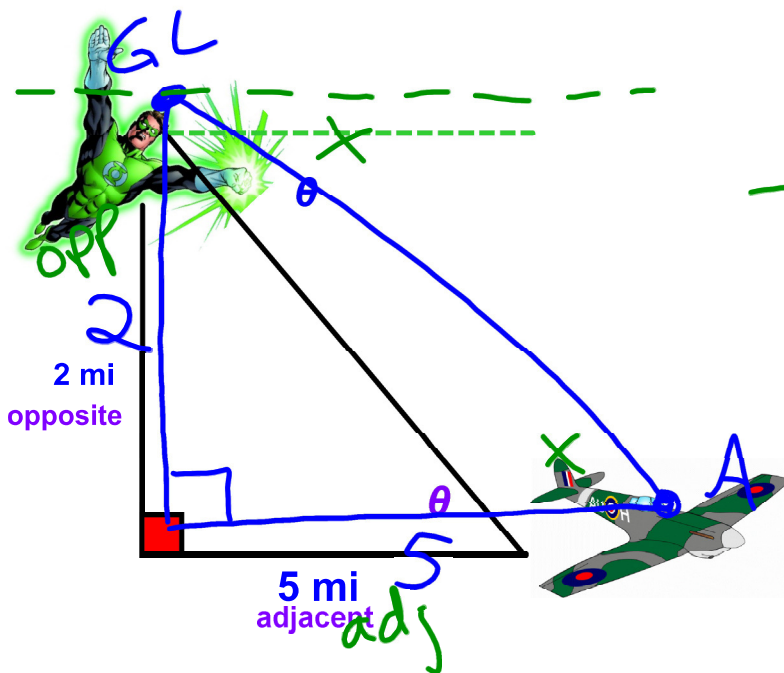
~~$$.8191 = \frac{64}{x}$$~~

$$\frac{x(.8191)}{.8191} = \frac{64}{.8191}$$

$$x = 78.1 \text{ ft}$$

EX 2

Green Lantern is flying at a height of 2 miles above the ground. The distance along the ground from Green Lantern to an airport is 5 miles. What is the angle of depression from Green Lantern to the airport?



S_o / C_A = T_A / O

Draw a picture.

Angles are congruent because of alternate interior angles.

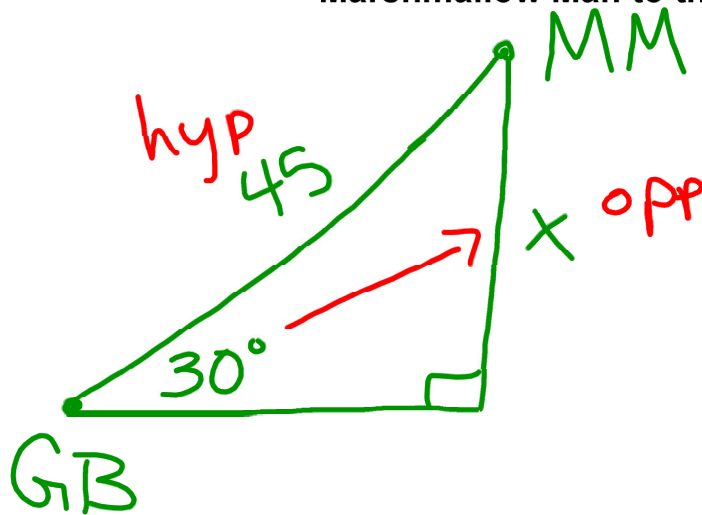
$$\tan X = \left(\frac{2}{5}\right)$$

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

$$X = 21.9^\circ$$

EX 4

The "Stay-Puff Marshmallow Man" from the movie Ghost Busters is storming the city. If a ghostbuster's angle of elevation to the top of the Stay-Puff Marshmallow Man is 30° and he wants to blast the top of his head with his plasma gun that only reaches 45 meters, determine the height of the Marshmallow Man to the nearest meter.



$$\text{SOHCAHTOA}$$

$$\frac{\sin 30}{1} = \frac{x}{45}$$

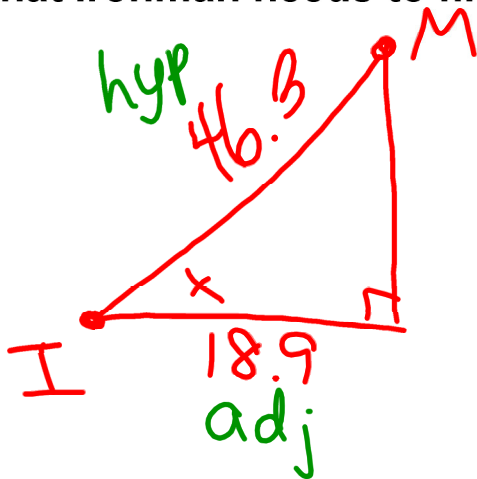
~~$$\frac{0.5}{1} = \frac{x}{45}$$~~

$$x = (45)(0.5)$$

$$x = 22.5 \text{ m}$$

EX 5

Ironman is standing 18.9 meters from a building in which Magneto is standing on. In order to stun Magneto, he needs to fire his pulsar beam 46.3 meters. Find the angle of elevation that Ironman needs to fire his pulsar beam.



$$\text{SOH(CA)HT(A)}$$

$$\cos X = \frac{18.9}{46.3}$$

$$X = \cos^{-1}\left(\frac{18.9}{46.3}\right)$$
$$X = 65.9^\circ$$