Seniors, bring ALL your stuff to return book and start your final in the annex.

Everyone else, glue in sheet to page 78.

p. 78-79   Angle of Elevation & Depression   14.3

Angle of Elevation and Depression
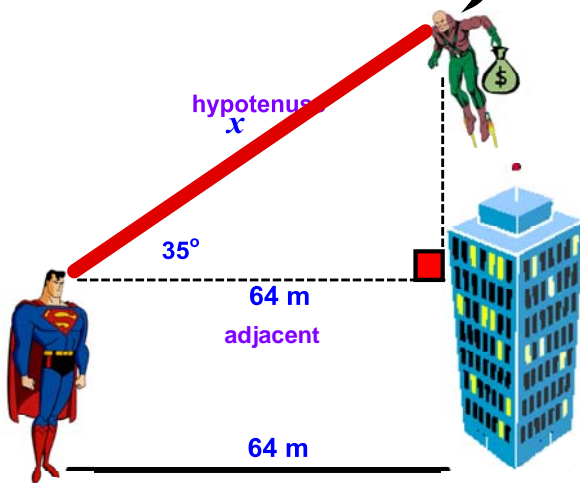
p. 78

LINE OF SIGHT: eye level.

ANGLE OF ELEVATION : seeing an object above your line if 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.

hypotenuse
x

35°

64 m
adjacent

64 m

Draw a picture.
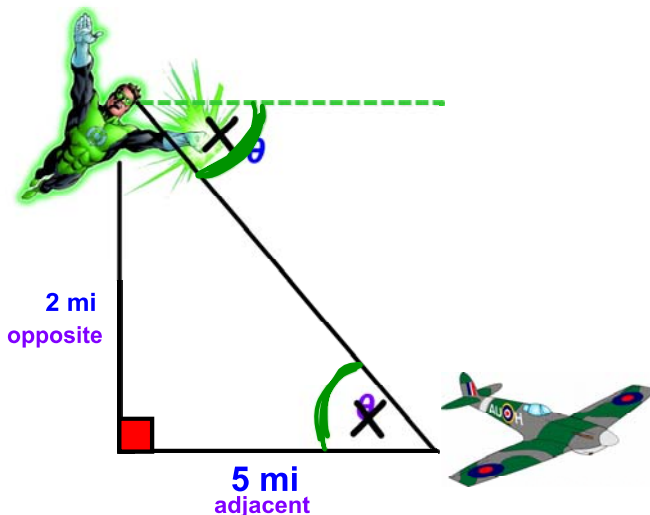
Apply the values.

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

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

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

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?

2 mi
opposite

5 mi
adjacent

Draw a picture.

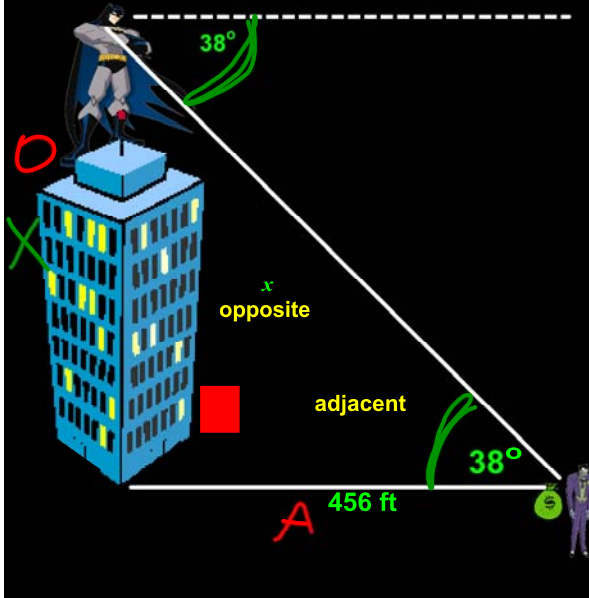**Angles are congruent because of alternate interior angles.**

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

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

$$x = 21.8°$$

EX 3

Batman is standing on top of a building making sure crime is being silenced. He spots his archenemy, the Joker, up to no good. Batman's angle of depression from the top of the building to the Joker is 38° and the distance from the base of the building to the Joker is 456 feet. Help Batman capture the Joker by calculating the height of building so that he can swoop down and put an end to the Joker's criminal ways.

38°

O

x
opposite

adjacent

38°

456 ft

A

Draw a picture.

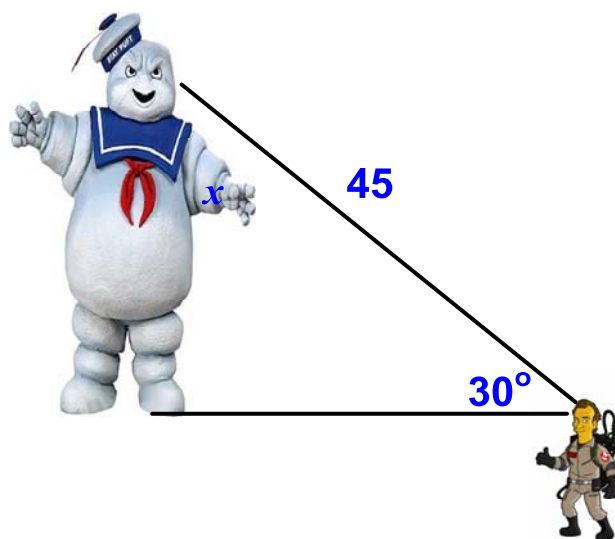$$\tan 38° = \frac{x}{456}$$

$$x = 456 \tan 38$$

$$x = 356.3 \text{ ft}$$

Finish examples

Finish all worksheets from week

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.
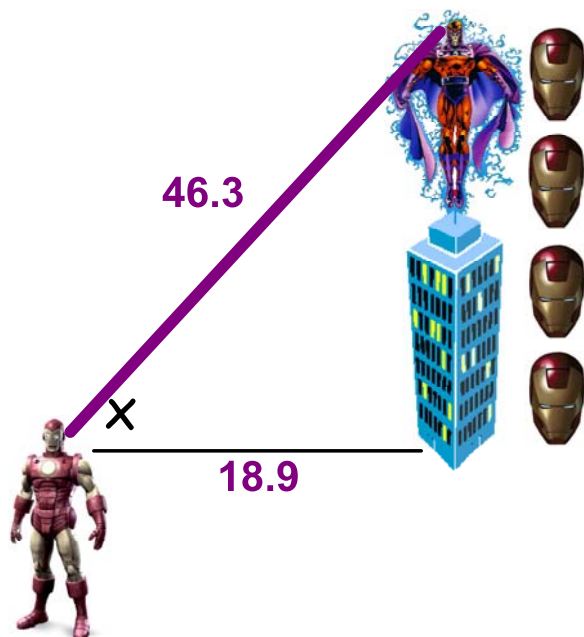
Draw a picture.

x

45

30°

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.

Draw a picture.

46.3

X

18.9