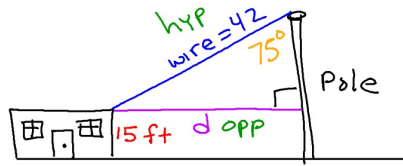An electrician on the roof of a 15 foot tall house runs a power line to the top of a nearby pole. The power line makes a 75° angle with the pole. If the electrician uses 42 feet of line to connect the house to the pole, how far from the house is the pole? Round to the nearest tenth.

SOHCAHTOA

hyp=42
wire=42
75°
Pole
15 ft   d   opp

$$\sin 75° = \frac{d}{42}$$

$$d = 40.6 \text{ ft}$$

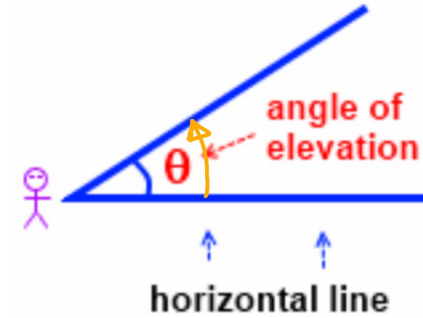## How tall is the pole?

hyp=42
wire=42
75°
Adj
Y
h
15 ft
15

The height of the pole is a combination of the height of the house (15 ft) and the adjacent leg of the triangle.
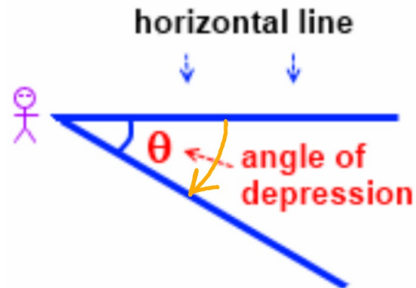
SOHCAHTOA

height of the pole = 15 + 10.9
= 25.9 ft

$$\cos 75° = \frac{Y}{42} \qquad Y = 10.9 \text{ ft}$$

---

angle of elevation
θ
horizontal line

---

horizontal line
θ — angle of depression

---

horizontal line
θ ← angle of depression
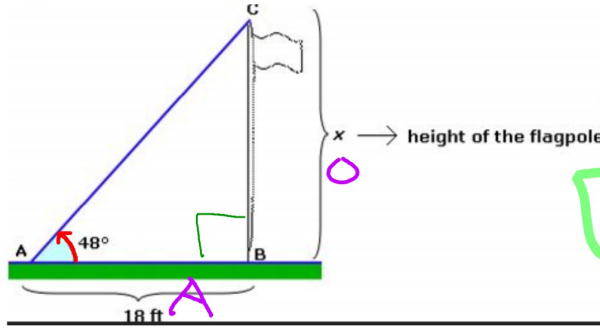A = θ
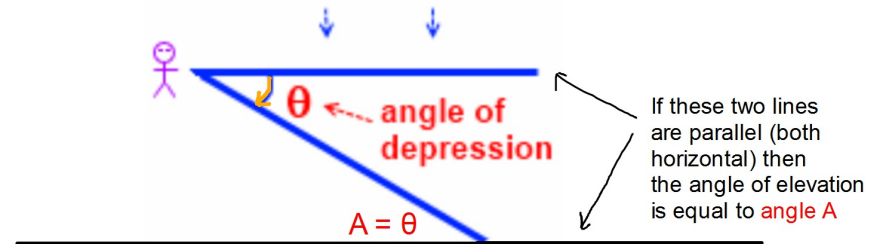
If these two lines are parallel (both horizontal) then the angle of elevation is equal to angle A

You are standing on the ground 18 feet away from a flagpole. The angle of elevation to the top of the flagpole is 48°. Find the height of the flagpole to the nearest hundredth of a foot.
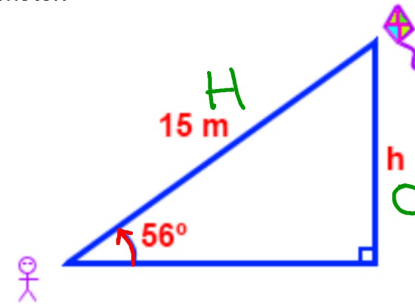
SOHCAHTOA

height of the flagpole

$$\text{Tan } 48° = \frac{X}{18}$$

$$X = 19.99 \text{ ft}$$

48°

18 ft

You are flying a kite and have let out 15m of string. If you see the kite with an angle of elevation of 56°, find the height of the kite to the nearest tenth of a meter.
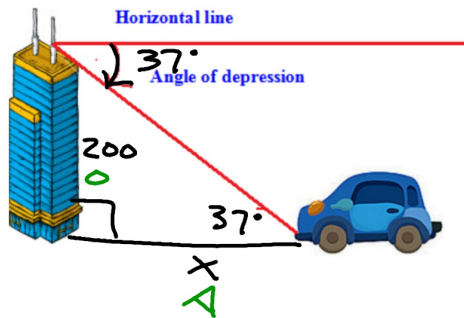
SOHCAHTOA

H

15 m

h

O

56°

$$\text{Sin } 56° = \frac{h}{15}$$

$$h = 12.4 \text{ m}$$

You are on the roof of a 200 foot tall building and see your friend's car parked on the street with an angle of depression of 37°. How far from the building is your friend's car parked? Round to the nearest tenth.

SOHCAHTOA

Horizontal line

37°

Angle of depression

200
O

37°

X

$$\text{Tan } 37 = \frac{200}{X}$$

1

$$X = 265.4 \text{ ft}$$

A guy wire is to be installed on a cell phone tower for support. You are at the top of the tower and see the anchor in the ground to which the guy wire is to be attached with an angle of depression of 49°. If the anchor is 70 feet from the base of the tower find the length of wire needed to the nearest hundredth.

SOHCAHTOA

49°

How long is this guy wire?
C ← H

70 ft (B)   49°   ← Anchor

A

$$\text{Cos } 49 = \frac{70}{X}$$

1
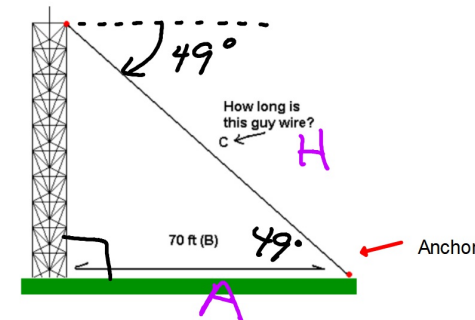
$$X = 106.70 \text{ ft}$$

You can now finish Hwk #3

Practice Sheet: Right Triangle Trigonometry (Sec 14-3)