

Thursday, March 19, 2020

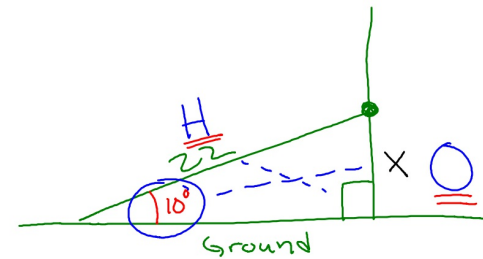
Sin, Cos, Tan Story Problems

Sec 7-1 For Alg 2

Sec 8-5 for Geometry



A 22 foot long ramp runs from the parking lot up to the loading dock of a building. The ramp makes a 10° angle with the ground. How high above the parking lot is the loading dock? Round to the nearest hundredth of a foot.



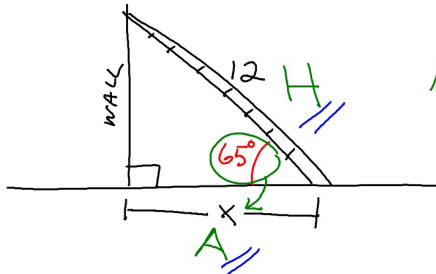
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$$22 \sin 10^\circ = \frac{X}{22} \cdot 22$$

$$X = 3.82 \text{ ft}$$

A 12 foot long ladder is placed up against a wall. The bottom of the ladder makes a 65° angle with the ground. How far from the wall is the bottom of the ladder? Round to the nearest tenth of a foot.

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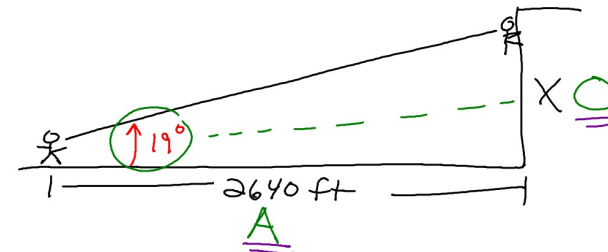


$$12 \cos 65^\circ = \frac{X}{12} \cdot 12$$

$$X = 5.1 \text{ ft}$$

You are half a mile (2640 feet) from the base of a cliff and look up at a 19° angle and see a rock climber on the face of the cliff. How high up on the cliff is the rock climber? Round to the nearest whole foot.

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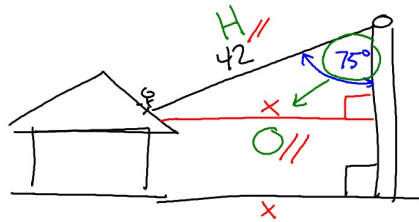


$$2640 \cdot \tan 19^\circ = \frac{X}{2640} \cdot 2640$$

$$X = 909 \text{ ft}$$

An electrician on the roof of a 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.

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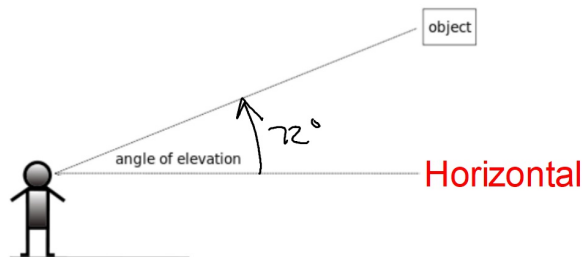
$$42 \cdot \sin 75^\circ = \frac{x}{42} \cdot 42$$

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

Angles of Elevation and Depression

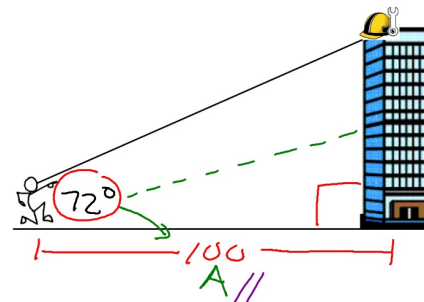
You are on the street and see an iron worker on the top of a building under construction with an **angle of elevation** of 72° . If you are 100 feet from the front door of the building find the height of the building to the nearest tenth of a foot.

Angle of Elevation: angle measured from the Horizontal upwards.



You are on the street and see an iron worker on the top of a building under construction with an **angle of elevation** of 72° . If you are 100 feet from the front door of the building find the height of the building to the nearest tenth of a foot.

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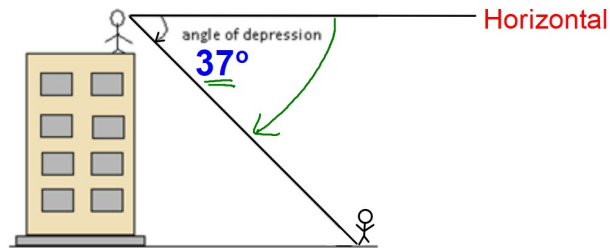


$$100 \cdot \tan 72^\circ = \frac{x}{100} \cdot 100$$

$$x = 307.8 \text{ ft}$$

You are on the top of a 120 foot tall building and see your friend on the ground with an **angle of depression** of 37° . How far away from the building is your friend?

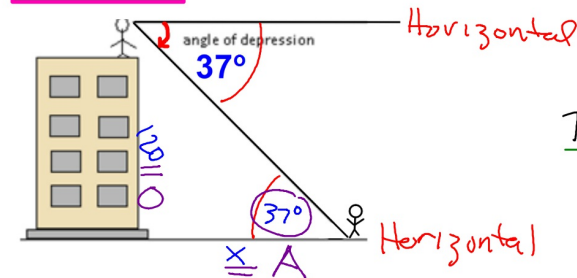
Angle of Depression: Angle measure from the horizontal downward.



You are on the top of a 120 foot tall building and see your friend on the ground with an **angle of depression** of 37° . How far away from the building is your friend to the nearest tenth.

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Method 1:



$$\tan 37^\circ = \frac{120}{X}$$

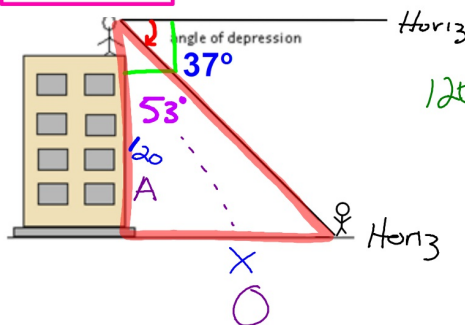
$$X = \frac{120}{\tan 37^\circ}$$

$$X = 159.2$$

You are on the top of a 120 foot tall building and see your friend on the ground with an **angle of depression** of 37° . How far away from the building is your friend to the nearest tenth.

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Method 2:



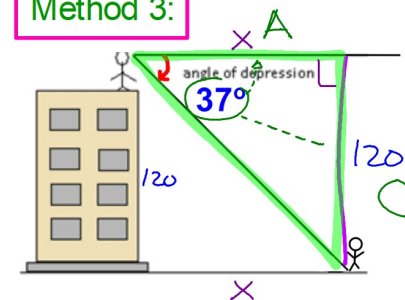
$$120 \cdot \tan 53^\circ = \frac{X}{120} \cdot 120$$

$$X = 159.2 \text{ ft}$$

You are on the top of a 120 foot tall building and see your friend on the ground with an **angle of depression** of 37° . How far away from the building is your friend to the nearest tenth.

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Method 3:



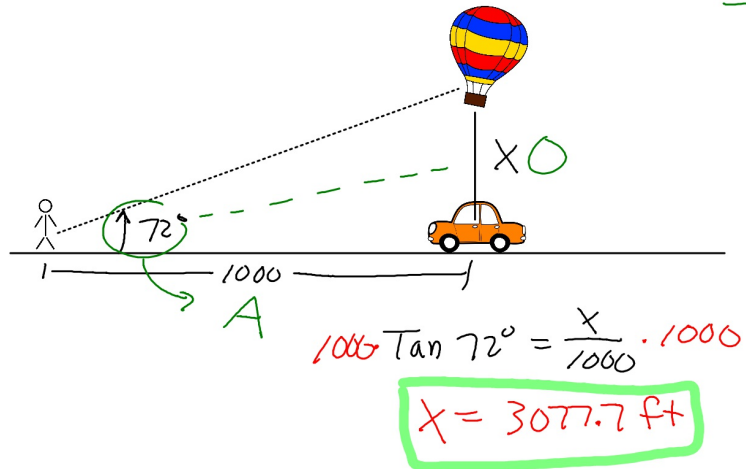
$$\tan 37^\circ = \frac{120}{X}$$

$$X = \frac{120}{\tan 37^\circ}$$

$$X = 159.2 \text{ ft}$$

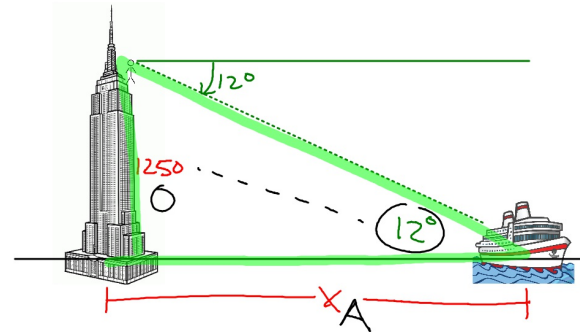
You are outside 1000 feet from your car when you see a hot air balloon with an **angle of elevation** of 72° . At that moment the balloon is directly over your car. Find the height of the balloon to the nearest tenth of a foot.

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You are at the top of the Empire State Building in New York City, 1250 ft above the ground. You see a ship on the East River with an **angle of depression** of 12° . How far away from the Empire State Building is the ship? Round to the nearest whole foot.

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$$\tan 12^\circ = \frac{1250}{X}$$

$$X = \frac{1250}{\tan 12^\circ}$$

$$X = 5881 \text{ ft}$$

You can now complete Practice #4 which is posted on my blog.

