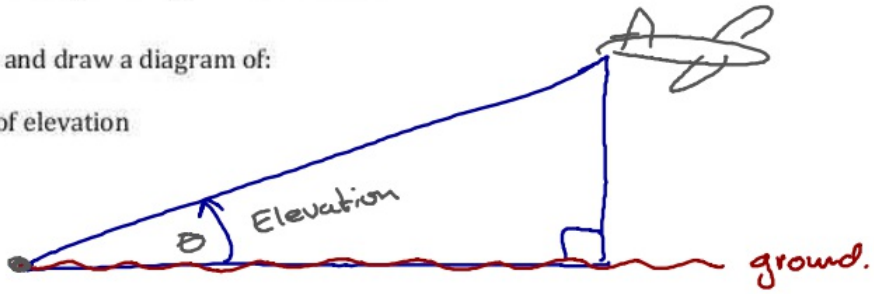
Trigonometry Unit Day 2 In Class Notes

Define and draw a diagram of:

Angle of elevation



Angle of depression

PROBLEM SOLVING PROCEDURE:

Problem: Read, Read, Underline.

Formulate: Think, Draw Picture, Equation

Compute: Solve

Interpret: Units, Context.

Validate: Does it make Sence.

Report:

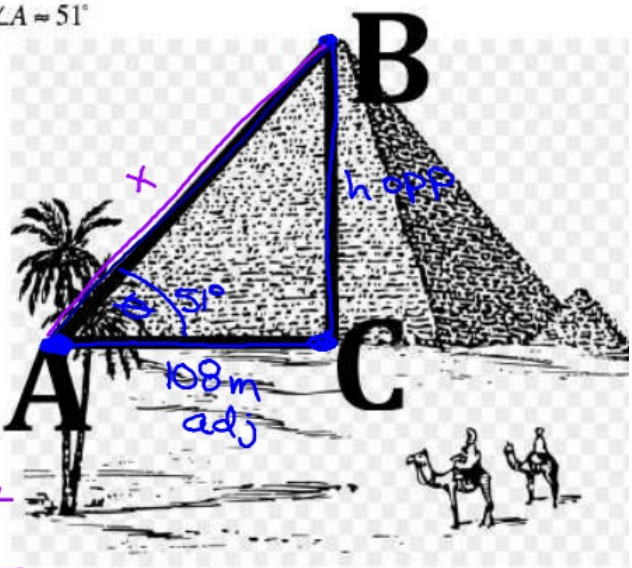
1. The pyramid of Khafre has $AC \cong 108$ m, and $m\angle A \approx 51^\circ$

What is the height?

$\tan 51^\circ = \frac{h}{108}$

$108(\tan 51^\circ) = h$

$133.4\text{m} = h$



What is the length of AB?

① $\cos 51^\circ = \frac{108}{x}$

$x = \frac{108}{\cos 51^\circ}$

$x = 171.6\text{m}$

② $108^2 + 133.4^2 = x^2$

$\sin 51^\circ = \frac{133.4}{x}$

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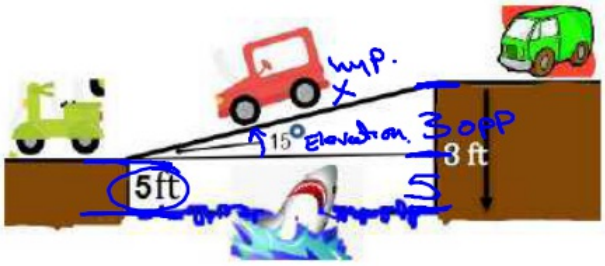
Soh - Cah - Toa

2. The diagram below represents a bridge (not drawn to scale). What is the length of the bridge?

$\sin 15^\circ = \frac{3}{x}$

$x = \frac{3}{\sin 15^\circ}$

$x = 11.6$ ft.



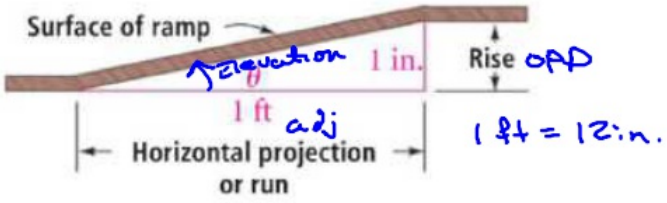
3. Wheelchair ramps must be constructed so the slope is not more than 1 inch of rise for every 1 ft of run. What is the maximum angle that the ramp can make with the ground? (Round to the nearest tenth of a degree.)

$\tan\theta = \frac{opp}{adj}$

$\tan^{-1}\left(\frac{opp}{adj}\right) = \theta$

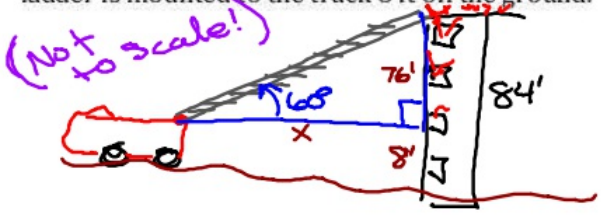
$\tan^{-1}\left(\frac{1}{12}\right) = \theta$

$4.8 \text{ in.} = \theta$



Not drawn to scale

4. How far from an 84 foot burning building should the base of the fire truck ladder be placed to reach the top of the building at an angle of 60 degrees with the ground? The ladder is mounted to the truck 8 ft off the ground.



$\tan 60^\circ = \frac{76}{x}$

$x = \frac{76}{\tan 60^\circ}$

$x = 43.9$ ft.

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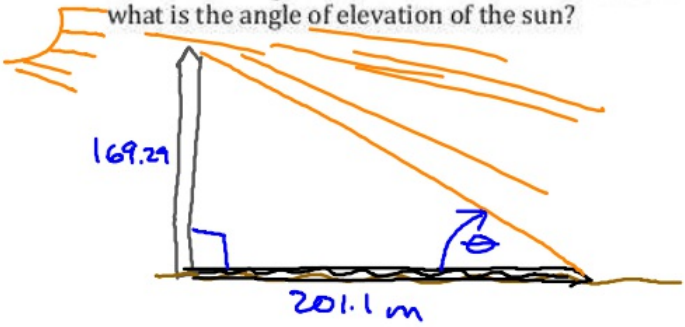
5. The Washington Monument is 169.29 meters tall. If it casts a shadow 201.1 meters long, what is the angle of elevation of the sun?



$\tan^{-1}\left(\frac{169.29}{201.1}\right) = \theta$

$40.1^\circ = \theta$

6. You are sitting at the edge of the Grand Canyon admiring the view when you notice a tour group at the bottom of the canyon. You estimate that the angle of depression from your spot on the edge to the group is 39 degrees. The sign says that the bottom of the canyon is 5000 feet below the rim. How far are you from the tour group (straight line distance)?

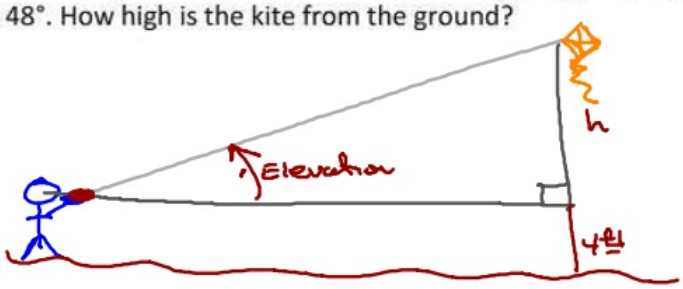
eyelevel

$\sin 39^\circ = \frac{5000}{x}$

$x = \frac{5000}{\sin 39^\circ}$

$x = 7945.1$ ft.

7. A 4-foot tall boy flies a kite with a 100-foot-long string. The angle of elevation of the string is 48°. How high is the kite from the ground?



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8. A 14-foot ladder is being used to get to the top of a 12-foot-tall wall. At what angle of elevation must the ladder be positioned in order to reach the top of the wall?

9. A mother gazes out a second-floor window at her son playing at the playground. If the mother's eye level is 12.6 meters off of level ground and the playground is 20 meters from the base of the building, what is the angle of depression from the mother's line of sight to the playground?

10. Burj Khalifa in Dubai is the tallest building in the world, standing at 828 meters. An adjacent building, 100 meters away, stands at 550 meters tall. What is the angle of depression from Burj Khalifa to the adjacent building?