Twig-onometry Project

Part 1: Practice Makes Perfect

| The Brief:	Watch Video of forestry service worker using a clinometer to indirectly measure the height of a tree
	https://www.youtube.com/watch?v=Zs_R7zYuaOk

Idea Development:	We have the ability to indirectly measure the height of tall objects outdoors using a clinometer app, tape measure, and trigonometric calculations

Before taking measurements outside, I want to check that you really understand the concepts you are about to apply. Please work together to solve the following questions.

1. Find x to the nearest tenth. Be sure to show ALL of your work.

30°

x

50 ft
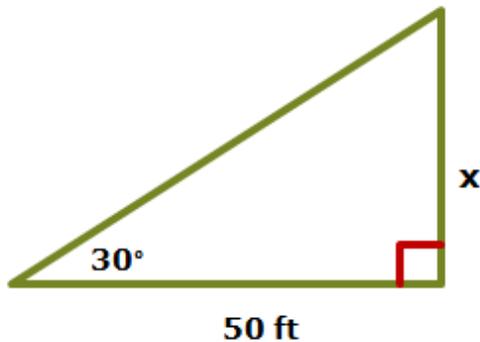
2. Jane is ready to indirectly measure this tree. She knows that her line of sight is 5.3 ft from the ground and that she is standing 100 ft away from the tree. Using her clinometer (a tool to measure angles) she knows that she must look up at an angle of 27° to see the top of the tree. How tall is the tree? Round to the nearest tenth.
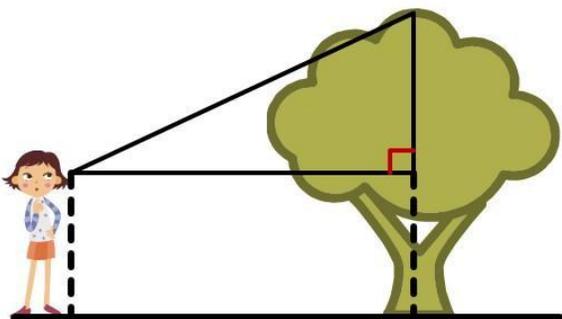
Part 2: "Surveying" the Scene and Destination Estimation

For this part of the project, you will be going outside. Once outside, come up with an object that you could measure indirectly. Some examples are, the height of a tree, roof, etc. Record each idea, draw a diagram and include a photo of the object to represent the problem and record each. **Example Below**

Object Measured: _Flag Pole_   Estimated Height: _30 feet_
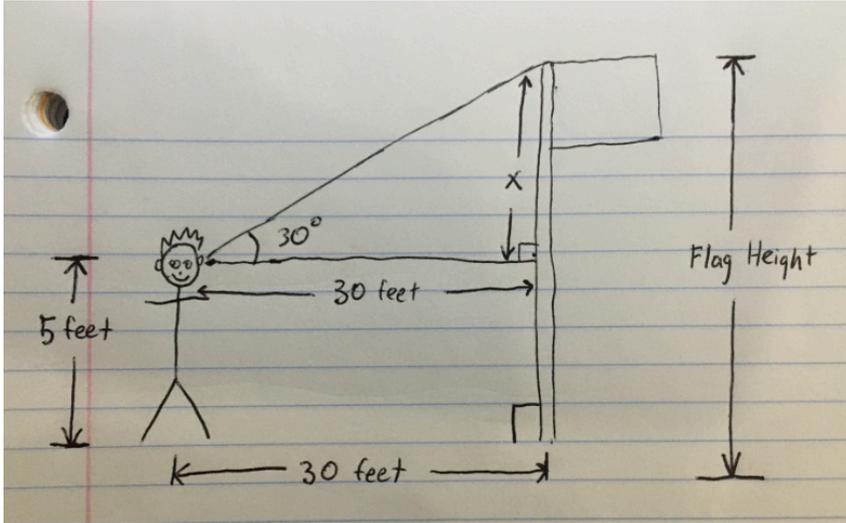
Distance to Eye-Level (from your eyes to the ground): _5 feet_

Distance from base of the Object to your feet: _30 feet_

Angle shown on Clinometer: _30°_

Height of Object Calculation (show work below):

Test: TEST	It is now time to use your digital clinometer app to find the angle of elevation from your eye to the top of your tall object

How to Measure your object:

1) Download a free clinometer app on your phone (rotating sphere clinometer or inclinometer or similar)

2) If you can't download a clinometer app, make your best estimate for the angle

3) If you do not have a ruler to measure the distance to the base of the object, you can count the number of steps it takes you to walk to the object and multiply your steps by 3

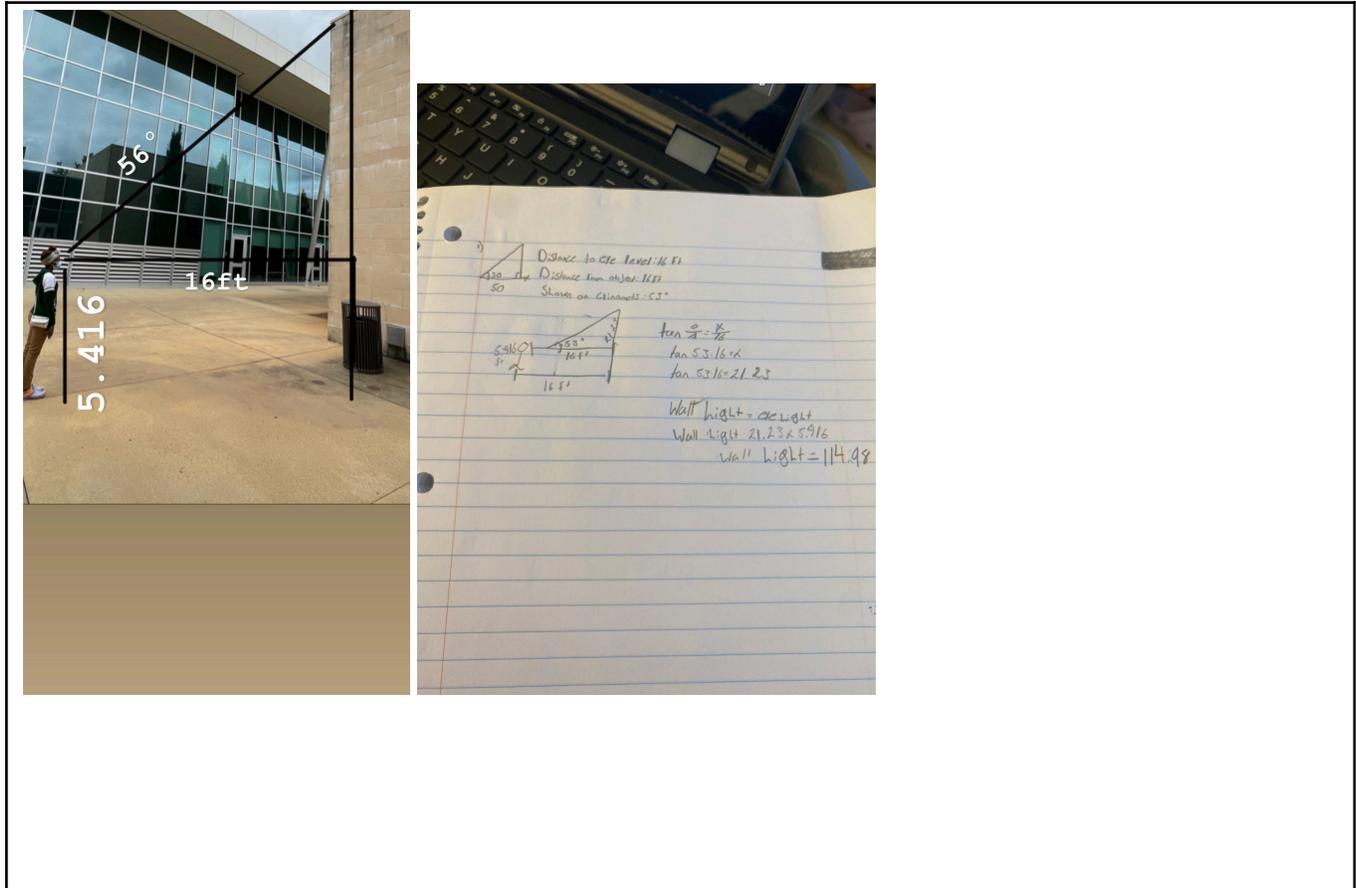**Object Measured:the building_____**   **Estimated Height**: _____

Diagram and Photo (insert photo of diagram and object in box below)

Distance to Eye-Level:_16ft_____

Distance from base of Object to your feet: 16ft_____ _____

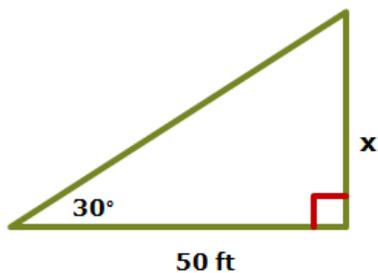**Angle shown on Clinometer: _53 degrees _____**

Height of Object Calculation (show in box below)
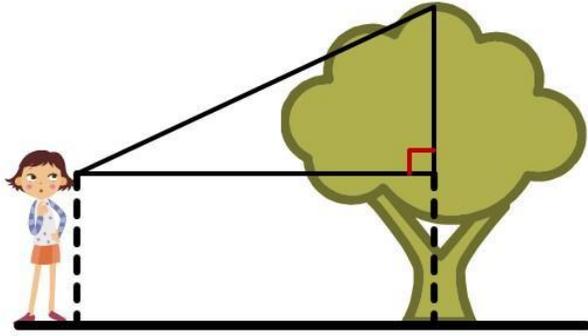
Answers Part II: Practice Makes Perfect

Before taking measurements outside, I want to check that you really understand the concepts you are about to apply. Please work together to solve the following questions.

1. Find x to the nearest tenth. Be sure to show ALL of your work.

28.9 ft_____

2. Jane is ready to indirectly measure this tree. She knows that her line of sight is 5.3 ft from the ground and that she is standing 100 ft away from the tree. Using her clinometer (a tool to measure angles) she knows that she must look up at an angle of 27° to see the top of the tree. How tall is the tree? Round to the nearest tenth.

56.3 ft_____