

## How much wood would a woodchuck chuck?

Mr. Deal wants the tree in the middle of his yard to disappear. However, before he cuts it down, he needs to figure out if it can fall in one direction without hitting a fence. So he needs your help to figure out the height of the tree.

### Part A Determine Height of Tree

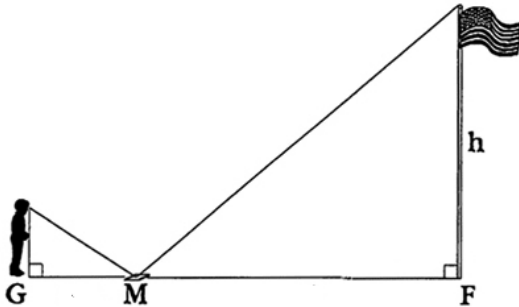
Option 1: Use the **Clinometer** to determine an angle of elevation. Remember to factor in the height of the person observing the angle.

Angle of elevation: \_\_\_\_\_

Distance from tree: \_\_\_\_\_

Draw a sketch that incorporates the measurements taken above. Then use those to determine the height of the tree.

Option 2: Use a mirror and the fact that the line of sight reflects off of a mirror at the same angle that it enters the mirror at to determine the height of the tree.



Record the necessary measurements into the picture above that will allow you to find the height of the tree.

Option 3: Record the shadow length of the tree and another shadow in the yard at the same time as well as its height. (This option may not be possible due to other obstacles located in the yard.)

Tree shadow length \_\_\_\_\_ Other shadow length \_\_\_\_\_

Height of 2<sup>nd</sup> object \_\_\_\_\_

Part B  
Other Measurements

Now record measurements to other objects in the yard that may be pose problems if the tree is cut. For instance, I do not want the tree to fall on my fence and crush it. Measure the distance from the base of the tree to the fences in order to determine if the tree will contact the fence when it falls. It will also be useful to measure the distance to the house from the tree. (It will be useful for you to draw a diagram and show the distances to the different objects in said diagram)

After viewing all the data, you must determine the best way to cut the tree.

Questions I want to know and that you should consider before you make your presentation to the class. (Presentation should include your estimate for the height of the tree, as well as a plan that you have to make the cutting of the tree as safe as possible)

Which direction should I try to make the tree fall?

Will it get stuck in another tree's branches?

Should I make it fall toward the house and have someone on the roof to catch it?

Should I use ropes to help slow the fall of the tree?

Where should I make the cut on the tree—How high, and on what side?

What devices should I use to help slow the decent of the tree?

What problems do you foresee occurring?

