Finding Tree Heights Using Trigonometry
Hands-On Activity Worksheet

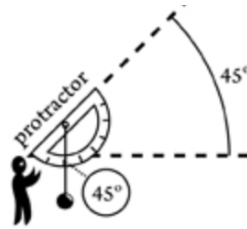## Trigonometric Ratios to Solve the Height of a Tree

1. You are standing 42 ft away from the base of a tree. Your line of sight is 5 ft from the ground. If you measure the angle of elevation to the top of the tree to be 43°, how tall is the tree? Show your work:
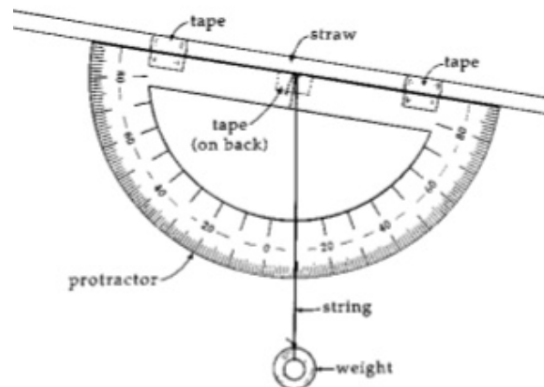
_____

Make your Clinometer!

What is a clinometer used to measure? _____

Things you will need :
-   Protractor
-   Straw
-   Tape
-   String
-   Weight

Use the image to create your homemade clinometer!

Method #1: Clinometer Method

You are standing 24.5 ft away from the base of a tree. Your line of sight is 5.08 ft from the ground. If you find the angle of elevation to the top of the tree using your clinometer, how tall is the tree?
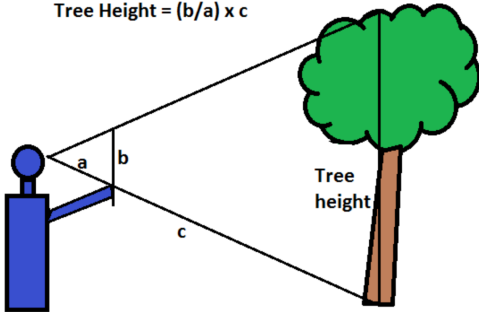

Show your work: (follow along with slides)

Height of of the Tree Using Clinometer Method: _____

Method #2 : Stick Measurement Method

Tree Height = (b/a) x c

Tree height

1) Find a straight stick or ruler

2) Hold the stick vertically at arm's length, making sure that the length of the stick above your hand equals the distance from your hand to your eye.

3) Walk backward away from the tree. Stop when the stick above your hand exactly masks the tree.

4) Measure the straight-line distance from your eye to the base of the tree. Record that measurement to the closest foot.

a = the distance from your eye to your hand

b = the length of your stick

c = the straight-line distance from your eye to the base of the tree

Example:
Show your work

Tree Height = b . c
$\qquad\qquad$ a

2 ft   1.6 ft

25 ft

Height of of the Tree Using Stick Method: _____