

“Using Trigonometry” Project



Ever wonder how they measured the height of Mt. Everest (29,029 feet)? How about a redwood tree (360 feet)? Not many people know, but we’re going to let you in on a little secret: it’s Trig!!!! And now you’re going to measure like the pros do!

Step 1: You will make your very own clinometer!

Step 2: Measuring with your clinometer:

1. Stand in front of a tall object that is perpendicular to the ground. DO not stand directly under the object. Your measurements will not be accurate if the object is not upright and/or you are not standing at the same level as the object.
2. Partner A will look through the straw and tilt his/her head up until he/she can see the very top of the object.
3. Partner B will read and record the angle measurement on the clinometer. Wait until the string stops moving and very carefully approximate the degree measure.
4. Partner B will measure and record the distance between where partner A is standing and the base of the tall object. Be sure the tape measure or yardstick is on the ground and runs from the base of A's feet to the base of the object via shortest path.
5. Partner B will measure the distance between partner A's eyeball and the ground. Make sure partner A is not slouching!

Step 3: You and your partner will complete this process with at least 4 tall objects in and around the school including the flagpole in front of the school, a column in the cafeteria, and two objects of your choice. Rotate roles and be sure to record each group member's role. Also be sure to use each clinometer at least once. Each partner should have a copy of the data.

Step 4: For the project, each partner should sketch a diagram for each object measured, and calculate the height of the object using the distance between Partner A and the object, the angle of elevation, the eyeball height, and the appropriate trigonometric function. Draw accurate pictures and show all of your work. Evaluate the reasonableness of your solution. If the height does not seem reasonable, explain why.

Step 5: Each partner will choose one of the objects that were measured. Who would need to know the height of this? An engineer? An architect? Maybe an insurance agent? Be creative! Choose a person that would need to know the height of this particular object and the reason why. Again, get creative! **Write a one-page report addressed to this person (not to your teacher), cleverly working in what this person's profession is and why they need this information.** Also, write a detailed description in this report on how you measured the height of this object.

What each person will hand in:

- 1. Each member's clinometer (upon returning to class).**
- 2. The following should be attached to half a poster board:**
 - a. The table showing all measurements made and who did the measuring. (Roles should be shared equally.)**
 - b. An illustration/calculation page: Draw a picture for each of the four objects with the measurements labeled. Include a person, the object, and the measurements correctly labeled. Show all of the trigonometric calculations and work necessary to determine each object's height in feet. (Refer to U-tube video on class webpage for example.)**
 - c. A one-page report addressed to professional working in what their job is and why they would need to know the height of this object. Also explaining to them in detail how you found the height of this object.**

DUE: "A" day - Monday 2/1 & "B" day - Tuesday 2/2,

NO Late projects will receive FULL credit!!!!

Name _____ Partner's Name _____

OBJECT	Person Measuring	Measured angle of elevation	Measured eyeball height	Measured distance from object	Sketch
Flagpole					
Column in cafeteria					

Criteria	Possible Points	Earned Points
Clinometer Construction *Neat (5) *Accurate (5) *Labeled with your name (5) *Turned in during class on 1/15 or 1/19 (5)	20	
Measurements and Calculations of Four Tall Objects *Picture, colored (3) *Labels in picture (3) *Accurate Formulas (3) *Accurate Work (3) *Correct Height (3)	60 (15 points per measured object)	
Report *Creative profession (5) *Creative reason for this needing to know height (5) *Accurate description of process (10)	20	
TOTAL	100	

