**The Height of the Flag Pole**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purpose: Use trigonometry to calculate the height of the flag pole in front of Cold Spring Harbor H.S. field.

Materials: Altitude finder, Meter tape, meter stick, pencils, scientific calculator.

Procedure: (describe the procedure in steps)

Diagram:

Data Table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Trial | Y2 (m) | X (m) | Theta(degrees) | Y1 (m) | Flagpole Height (m) |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |

Average Height: \_\_\_\_\_\_\_\_

Formulas/Calculations:

TanY1/X or Y1=X Tan

H=Y1+Y2

(Y2: height of the student who takes the measurement of the angle 

Substitute the numbers from the data table and show how you got the answer.

Trial 1: Y1= H=

Trial 2: Y1= H=

Trial 3: Y1= H=

Trial 4: Y1= H=

Trial 5: Y1= H=

Graph#1: The effect of the horizontal distance X on the angle theta.



Graph#2: The effect of the angle theta on the height of the flagpole.



Results:

Sources of Error:

Questions:

Explain how did you convert your height from feet to meters.

Explain how did you calculate the distance Y1 using the formula of the tangent of angle theta.

What happened to the measurement of angle theta when you started to increase your horizontal distance from the bottom of the flag pole?

Describe the relationship:

What is the relationship between the vertical distance Y1 and angle theta?

How did you calculate the height of the flagpole H.

Why is important that only one person takes the measurement of the angle theta?