

MATH 1332
Instructions for Trigonometry Project

You will be using trigonometry to measure the height of the flagpole in the main courtyard. We will make the necessary measurements in a group but you will need to do the calculations on your own. Make your measurements carefully as accuracy will be rewarded.

Each group will be supplied with a rather crude transit to use to measure the angles and a stick on which to balance the transit.

One person will use the level on the stick to hold it completely vertical. Once the stick is positioned, mark where it rests on the sidewalk.

Balance the transit on the stick. Another person will use the level on the transit to hold it completely horizontal.

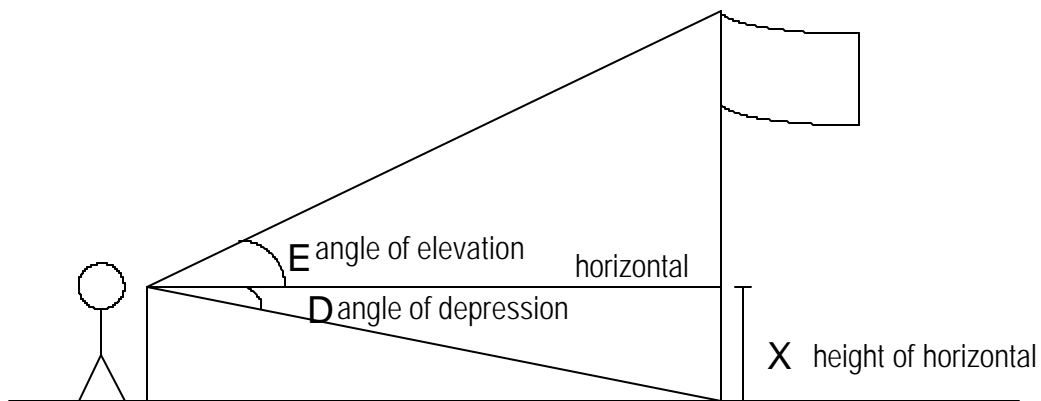
A third person will stand at the flagpole to mark the horizontal and measure its height.

The final person will measure the angle of elevation and the angle of depression.

Sight along the horizontal line of the transit and have your group member mark this on the flagpole.

Sight along the moving piece of the transit to the top of the flagpole to measure the angle of elevation.

Sight along the moving piece of the transit to the bottom of the flagpole to measure the angle of depression.



Calculate the height of the flagpole.

Use the bottom triangle to calculate the distance from the transit to the flagpole (the length of the horizontal).

Then use the top triangle to calculate the height of the flagpole that is above the horizontal.

Add this to the height of the horizontal and you will have the height of the flagpole.

Name _____

MATH 1332
Grading Rubric for Trigonometry Project

_____ Work with your group to **find the necessary measurements**. Work carefully since the
6 points accuracy of your final answer will depend on your measurements. Record them below.

height of the horizontal in feet and inches: $X =$ _____

angle of elevation: $E =$ _____

angle of depression: $D =$ _____

List the members of your group in the space below and assign each of them a grade for these 6 points. You are grading them on their participation in measuring the flagpole. Since you must all use the same data, it is important that everyone be as helpful and as careful as possible.

_____ **Calculate the horizontal distance from the flagpole.** You will want to do the calculations in
15 points inches but you should also convert the answer to feet and inches -- not decimal fractions. Do your work on scratch paper and then copy it neatly into the space below. Show clearly how you arrived at your answer. This is an intermediate step so round your answer to 4 decimals before using it in the next step.

- _____ (5) picture of bottom triangle with appropriate labels
- _____ (8) clear and accurate trig calculations
- _____ (2) final answer in feet and inches

_____ **Calculate the height above the horizontal.** Again, you will want to do the calculations in inches but you should also convert the answer to feet and inches -- not decimal fractions. Do your work on scratch paper and then copy it neatly into the space below. Show clearly how you arrived at your answer. This is an intermediate step so round your answer to 4 decimals before using it in the next step.

15 points

_____ (5) picture of top triangle with appropriate labels

_____ (8) clear and accurate trig calculations

_____ (2) final answer in feet and inches

_____ Give your **final answer for the height of the flagpole** here _____

14 points

It should be in feet and inches. Points will be given based on the percentage of error in your answer. Show your calculations in the space below.

_____ (4) final answer in feet and inches

_____ (10) accuracy of answer