

MAT 108-03
Spring 2008

Project 2 - Due Monday, March 3.

You may work on the project individually or in groups of three or less, but each person should submit his/her own paper. Your report should include written explanations and comments, along with your results and computations. Be sure to answer the questions asked. Keep at least three significant digits in numbers generated as part of your answers. If you work with others or receive help from others, you should reference them in your write-up. You should not ask University tutors to help you with this project.

Suppose you are caught in a police radar trap which shows that you were doing 58 mph in a 55 mph zone. The radar gun that was used is known to never produce a relative (percentage) error of more than 6%. (Hence, 6% is the maximum possible **relative** error, not the maximum possible absolute error.) Note that 58 mph is the measured value, not the exact value. The exact value is how fast you were actually going, which you may know from looking at your speedometer. However, your reading from the speedometer may be irrelevant to the proceedings. If you were going above the speed limit, you probably would not admit it; if you were going below the speed limit and stated so, the officer and court would probably not believe you, given the radar reading.

- a. What is the lowest speed you could have been going based on the results and accuracy of the radar gun? What is the highest speed you could have been going based on the results and accuracy of the radar gun? You claim that the evidence is not sufficient to find you guilty. Justify your argument, and explain your reasoning. Hint: As part of your solution you will need to use the given maximum possible relative error to determine the maximum possible absolute error.
- b. What would be the judgment if the same radar gun showed that you were doing 33 mph in a 30 mph zone? Explain and justify your answer.