

Homework #0

- For the following questions, identify the exact quantity and the approximation. Then calculate the absolute and relative errors.
 - An inaccurate scale gives the weight of a chicken as 1.4 pounds. The actual weight is 1.273 pounds.
 - A newscaster states the distance between the city centers of two cities is 120 miles. Looking up an encyclopedia, you find the exact number happens to be 122.342 miles.
 - A professor of an astronomy class states the distance between the centers of a certain planet and its moon is at this moment 120,000 miles. Going outside, you perform an experiment that gives what you accept as the actual distance of 122,342 miles.
 - The exact price of a pair of shoes is \$135. You are ecstatic as you thought it was 10% more expensive.
- For the following questions, calculate bounds from above for the absolute and relative errors.
 - A newscaster states that the number of votes a certain candidate received is 55,121, with error within plus or minus 200 votes.
 - The weight of a camera lens is stated as 760 grams after rounding to the nearest ten grams.
 - The length of a nail, measured using a ruler, happens to fall somewhere in between the 22mm and 23mm marks. We choose 22mm as the approximate length.
 - Repeat the previous problem with 23mm and 22.5mm chosen as the approximations.
- Using Matlab, write a function in the file "hw0poly.m" that takes as input a number x and returns as output $p(x)$, where p is a polynomial of your choice of degree ≥ 3 .
 - Turn in your program.
 - Test your program against hand calculations for three chosen numbers.
- Using Matlab, write a function that takes as input two numbers a and b and returns as output the slope of the secant line at these two locations for the polynomial p you chose in the previous exercise. Be sure to call the function you wrote in your previous exercise when you want the value of p at a location: for example, `hw0poly(2)` when you want $p(2)$.
 - Turn in your program.
 - Write down your results for the following three sets of data: $a = 0, b = 1$; $a = 1, b = 0$; and $a = -1, b = -1.001$.