Math 302: Problem Set 4

Due: October 1, 2009

Email me your m-files and results as attachments in ONE email with each m-file having the format `firstname_lastname_prob.m`. Be sure to comment your code so I can follow it.

1. (25 points) Write a user defined Matlab function, with two inputs and two output arguments that determines the height in centimeters and mass in kilograms of a person from his height in inches and weight in pounds. For the function name and arguments use `[cm,kg]=STtoSI(in,lb)`. The input arguments are the height in inches and weight in pounds, and the output arguments are the height in centimeters and mass in kilograms.
   Grading: 5 points for defined function, 15 points for correct formulas, 5 points for commenting

2. (25 points) By now you know the value P of a savings account with an initial investment of P_0 and annual interest rate r after t years is

$$P = P_0 \left(1 + \frac{r}{m}\right)^{mt}$$

   where m is the number of times the interest is compounded in a year. Write a user-defined Matlab function that calculates the value of a savings account. For the function name and arguments use `P = savings(P0,r,m,t)`.
   Grading: 5 points for defined function, 15 points for correct formulas, 5 points for commenting

3. (25 points) Write a user-defined Matlab function that calculates the local maximum or minimum of a quadratic function of the form: $f(x) = ax^2 + bx + c$. For the function name use `[x,y]=maxmin(a,b,c)`. The input arguments are the constants a, b, and c and the output arguments are the coordinates x and y of the maximum or minimum.
   Grading: 5 points for defined function, 15 points for correct formulas, 5 points for commenting

4. (25 points) Write a user-defined Matlab function that determines the angles of a triangle when the lengths of the sides are given. For the function name and arguments use `[al,bet,gam]= triangle(a,b,c)`.
   Grading: 5 points for defined function, 15 points for correct formulas, 5 points for commenting