MATH.2720   Introduction to Programming with MATLAB
Homework on Function Files (Due 3/7)

Please email the function files you create to `stephen_pennell@uml.edu`

You should not use the `input` command in your function files. Inputs should be passed to the function as `function_name(inputs)`

1. Write a function file that takes a temperature in degrees Fahrenheit as input and produces the corresponding temperature in degrees Celsius as output. Test your function with the inputs 32°F and 98.6°F.

2. Write a function file that takes the lengths of the three sides of a triangle as input and produces the area of the triangle as output. Test your function with the inputs $(3, 4, 5)$ and $(1, 1, 1)$. You might want to use Heron's Formula for this problem. Google it if you don't know it.

3. Write a function file that takes the temperature T (in degrees Fahrenheit) and wind velocity v (in miles per hour) as input and produces the wind-chill temperature as output. Test your function with the input 32°F and 10 mph. The wind chill temperature, T_{wc}, is calculated by

$$T_{wc} = 35.74 + 0.6215T - 35.75v^{0.16} + 0.4275Tv^{0.16}$$

4. Write a function file that takes a loan amount P (in dollars), the duration of the loan y (in years), and the interest rate r and produces two numbers as output: the monthly payment M and the total payment T (monthly payment times number of months the loan runs). Test your function with the input $P = 100000$, $y = 15$, $r = 0.05$. The monthly payment M is given by

$$M = \frac{P(r/12)}{1 - (1 + r/12)^{-12y}}$$

5. Write a function file that takes the coordinates (x_0, y_0) of the center of a circle and the radius r of the circle and produces a 2D plot of the circle. There is no numerical output.

6. Write an anonymous function that calculates the distance between two points (x_1, y_1) and (x_2, y_2) in the plane given the coordinates x_1, y_1, x_2, y_2. Please put your code in a script file and send me the file. Test your function with the input $1, 2, 3, 4$.