

MATH.2720 Introduction to Programming with MATLAB
Homework on Function Files (Due 3/27)

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.