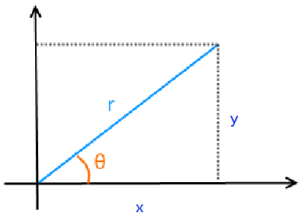
Fall 2012 MATLAB Assignment 4

Work the following problems (NOTE: these are RELATED TO the corresponding page and problem number from Gilat. Do NOT work the problems from the actual Lab Manual, or you will receive NO CREDIT!)

1. **g249x06**:
   (a) Enter the function $y(x) = 0.9x^4e^{-0.1x} - 15x^2 - 5x$ as an anonymous function.
   (b) Use the function to calculate $y(-2)$ and $y(4)$.
   (c) Use the function to make a plot from $-3 \le x \le 5$.

2. **g251x15**: Write a user-defined MATLAB function that determines the unit vector in the direction of the line that connects two points (A and B). For the function name and arguments use **u=unitvec(A, B)**. The input argments to the function are vectors A and B, each with the Cartesian coordinates of points A and B. The output u is the unit vector in the direction of the vector that starts at A and ends at B. If points A and B have two coordinates each (they are in the x-y plane), then u is a two-element vector. If points A and B have three coordinates each (they are in 3-dimensional space), then u is a three-element vector. Use the function to determine the following unit vectors:
   (a) In the direction from the point (1.5, 2.1, 4) to the point (11, 15, 9).
   (b) In the direction from the point (1, 0) to the point (0, 1).
   (c) In the direction from the point (−11, 3, −2) to the point (−13, −4, −5).

3. **g254x25**: Write a program in a function file that converts Polar coordinates (r, θ) to Cartesian coordinates (x, y) (See figure below and section 13.4 in Stewart). For the function name and arguments use $[x\,y] = Pol2Cart(r, th)$ where the input arguments are the Polar coordinates (th in degrees) and the output arguments are the Cartesian coordinates.



   Use the function to convert the following to Cartesian coordinates:
   (a) (5, 23°)
   (b) (15, 125°)
   (c) (12, 320°)

4. **g258x36**: Create the function specified in the problem using $R = 1100\,\Omega$ and $C = 9\,\mu F$. (NOTE: recommend using **logspace** to create the vector ω).

5. Also work **s611x15** from the Stewart text. Use a function for a_n (a help search will show you how to do factorials), then a loop to compute partial sums WHILE $|a_{n+1}| \le .0001$.