CS101: Homework #6

This assignment is due by 11/13 for all sections.

For section 007/009, homework should send to ssv33@njit.edu
For section 011/101, homework should send to xw29@njit.edu
with a subject line read as: CS101/section HW#06

3.7 Exercises.

3.1 Plot the function \( y(x) = e^{-0.5x} \sin(2x) \) for 100 values of \( x \) between 0 and 10. Use a 2-point-wide solid blue line for this function. Then plot the function \( y(x) = e^{-0.5x} \cos(2x) \) on the same axes. Use a 3-point-wide dashed red line for this function. Be sure to include a legend, title, axis labels, and grid on the plots.

3.6 Plot the function \( f(x) = x^4 - 3x^3 + 10x^2 - x - 2 \) for \(-6 \leq \theta \leq 2\pi\). Draw the function as a solid black 2-point-wide line, and turn on the grid. Be sure to include a title and axis labels, and include the equation for the function being plotted in the title string. (Note that you will need steam modifiers to get the italics and the superscripts in the title sting.)

3.11 Assume that the complex function \( f(t) \) is defined by the equation \( f(t) = (1 + 0.25i)t - 2.0 \). Plot the amplitude and phase of function \( f \) for \( 0 \leq t \leq 4 \) on two separate subplots within a single figure. Be sure to provide appropriate titles and axis labels. [Note: You can calculate the amplitude of the function using the MATLAB function \text{abs} and the phase of function using the MATLAB function \text{phase}].

3.12 Create an array of 100 input samples in the range of 1 to 100 using the \text{linspace} function, and plot the equation \( y(x) = 20 \log_{10}(2x) \) on a \text{semilogx} plot. Draw a solid blue line of width 2, and label each point with a red circle. Now create an array of 100 input samples in the range of 1 to 100 using the \text{logspace} function, and plot the equation \( y(x) = 20 \log_{10}(2x) \) on a \text{semilogx} plot. Draw a solid red line of width 2, and label each point with a black star. How does the spacing of the points on the plot compare when using \text{linspace} and \text{logspace}?