

## MATLAB Tutorials

Work through all of the following tutorials. Understand and be able to implement everything in these tutorials.

<http://www.mathworks.com/help/matlab/getting-started-with-matlab.html>

### Statement

I confirm that I understand and read through all of the introductory material at the above website. Further, I confirm that I understand the information and am able to apply the concepts that it taught.

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Signature

## MATLAB Practice

### Problem #1 – Calculating and Plotting Functions

Use MATLAB to plot all three of the following functions on the same plot using a different color for each line. The figure must have a white background, lines should be of reasonable thickness, a legend should be included to identify the functions, enough points used to resolve the lines smoothly, and the axes must be labeled. **Do not use any for loops.**

$$f_1(x) = \cos(x)$$

$$f_2(x) = \exp\left[-(x/2)^2\right] \quad -10 \leq x \leq 10$$

$$f_3(x) = f_1(x)f_2(x)$$

### Problem #2 – Matrices

Use MATLAB to build the following matrix. Calculate and display its eigen-values and eigen-vectors. **Build the matrix using the function `diag()` and do not use any for loops.**

A =

-2	1	0	0	0	0	0	0	0	0
1	-2	1	0	0	0	0	0	0	0
0	1	-2	1	0	0	0	0	0	0
0	0	1	-2	1	0	0	0	0	0
0	0	0	1	-2	1	0	0	0	0
0	0	0	0	1	-2	1	0	0	0
0	0	0	0	0	1	-2	1	0	0
0	0	0	0	0	0	1	-2	1	0
0	0	0	0	0	0	0	1	-2	1
0	0	0	0	0	0	0	0	1	-2

Hint: `[V,D] = eig(A)`