# MATLAB: Introduction <br> Part 1 - Assignment 

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This assignment will not be graded; therefore, it is optional. Use it as a form of exercising what we covered in class. It is recommended that you create a function or script M-file with code cells corresponding to the problems and/or their parts (let us call it main M-file). This function or script can then call other M-files or subfunctions. Publish your main M-file to HTML. Finally, compress all the necessary files into a .zip or .tar file and e-mail it to me at bacalfa@cmu.edu.

## Problem 1

Calculate the value of the function $y(x)=|x| \sin x^{2}$ for values of $x=\frac{\pi}{3}$ and $\frac{\pi}{6}$.
Hint 1: Use the MATLAB command abs( x ) to calculate $|x|$.
Hint 2: You do not have to create a subfunction or a function M-file for this problem if you do not want to.

## Problem 2

Create the following vectors and matrices and perform the operations.
Hint 1: Create variables to store the vectors and matrices to help you do the calculations.
Hint 2: Use the command eye(n) to create an $n$-by-n identity matrix.
(a)

$$
\left[\begin{array}{c}
1 \\
-3 \\
2
\end{array}\right]+\left[\begin{array}{c}
-1 \\
3 \\
-2
\end{array}\right]=\left[\begin{array}{l}
? \\
? \\
?
\end{array}\right]
$$

(b)

$$
3\left[\begin{array}{lll}
2.6 & 3.5 & -8.9
\end{array}\right]\left[\begin{array}{c}
-2 \\
-9 \\
5
\end{array}\right]-\frac{4}{3}=?
$$

(c)

$$
\left[\begin{array}{ll}
1 & 2 \\
2 & 1
\end{array}\right]\left[\begin{array}{c}
-1 \\
1
\end{array}\right]+0.7\left[\begin{array}{c}
\frac{1}{3} \\
-\frac{1}{6}
\end{array}\right]=\left[\begin{array}{l}
? \\
?
\end{array}\right]
$$

(d)

$$
\left(\left[\begin{array}{lll}
1 & 0 & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{array}\right]\left[\begin{array}{c}
10 \\
0 \\
5
\end{array}\right]\right)^{T}-\left[\begin{array}{lll}
2 & -5 & 1
\end{array}\right]\left[\begin{array}{ccc}
4 & 2 & -5 \\
2 & 1 & 3 \\
-5 & 3 & 2
\end{array}\right]=\left[\begin{array}{lll}
? & ? & ?
\end{array}\right]
$$

## Problem 3

Evaluate the function

$$
f(x)=\frac{x^{2} \cos \pi x}{\left(x^{3}+1\right)(x+2)}
$$

for the following cases:
(a)
$x \in[0,1]$ in steps of 0.01
(b)

100 linearly-spaced values of $x$

