

HW #1 Due by class time--we will go over these problems then.

Each problem should be an independent complete problem/solution. A person who knew a little MATLAB should be able to sit down and read each problem and based just on what you have written know what you are trying to do (emphasis: **from what you write and explain!**) and how you accomplished the task. You may refer to known Physical Principles---you don't need to reproduce a physics text, but you should refer to any laws you use by name.

Problem A: Text Problem 1.18 a)

Problem B: Text Problem 1.18 b) and c)

Problem C: Text Problem 1.22 a), b), c), d)

Problem D: Create an M-file which is NOT a function M-file and which solves Problem 1.22 e) by producing a vector of times and a vector of velocities over the specified interval. The M-file should display the last 5 velocity values of this approximation. In addition your M-file should produce a nice graph of these velocities over the entire time interval. Since this is the first M-file I have requested I will outline what I expect here as an answer: Outline the problem, show me your M-file, show me the output. You can save the graph and insert it into the submitted answer and, if you wish, you can take a screenshot and display the vector output, or alternatively "cut-and-paste" these vectors.

Problem E: Create an M-file which IS a function M-file and which solves Problem 1.22 e) except for N steps rather than 8 steps. The sole input should be N, the number of steps, and the output should be the last 5 velocity values of this approximation and a nice graph of these velocities over the entire time interval.

Problem F: Create an M-file that, when invoked, asks you to input N. It then checks to see if the input is a positive integer. If it is not, the script returns the response "N must be a positive integer." If the integer is bigger than 100 the script should respond "N exceeds 100." If the positive integer is less than 100 the script should respond "N is less than 100."

Problem G: Create smooth-looking graphs of $y=\sin(x)$ and $y=\sin(x^2)$ on the same figure on the interval $[0,3]$. These graphs should be different colors, the axes should have labels "time" and "distance" and there should be legend and title on the graph. Then, using the subplot command, put the same two graphs side-by-side in one MATLAB figure with different titles. The word "eek" should be located near the point $(0.2, -0.8)$ in the first graph and the word "wow" should be located near the point $(0.3, 1)$ on the second graph.

Problem H: Create an M-file that, when invoked, looks for and reads a file named "input.txt" containing two numbers which we will call x and y, separated by commas, such as "4,9". It then creates a file called "output.txt" containing 75 numbers $1*x*y$, $2*x*y$, $3*x*y$, ..., $75*x*y$.