Sample Competency Test#1

The test is open required textbook and one 8.5×11 page of handwritten notes. Only MATLAB (MATLAB help is allowed too) should be open on your computer.
NO internet connections, NO calculators, NO access to other Mfiles, NO cell phones, NO thumb drives.
You are asked to write a program in MATLAB. Keep saving your program. The test lasts 7**5** minutes.

- **Open a new Mfile. Name your Mfile *lastname_firstname.m* and keep saving it on the desktop.**
- **Use %% for each question (e.g %% Question#4) so that what follows shows up as a separate cell. No other comments are needed.**
- **All inputs and outputs should be assigned to variables (no *ans* as variable output name) and the outputs should be in decimal or scientific format.**
- **There is no need to use fprintf or disp statements for any problem.**
- **Do NOT use the semicolon anywhere to suppress command window output <u>except as noted in Questions #3 and #8 when you are generating a plot</u>.**
- **You can use *clear all* only in the beginning of the program. You can clear individual variables though if needed.**
- **All questions are worth xx points.**

1. Put your full name, section number, semester and year on 4 separate comment lines.
2. Multiply matrix $\begin{bmatrix} 2 & 3 & 4 \\ 5.2 & 6 & 7 \\ 8 & 9 & 1 \end{bmatrix}$ by $\begin{bmatrix} 4 & 6 \\ 78 & 5 \\ 1 & 1 \end{bmatrix}$
3. Plot $y=5e^{3x}$ on a log-log plot. Plot the graph from x=0 to 10. Suppress all outputs. The plot needs to have a title and labeling of the axes.
4. Assign velocity of a body $t^2+\ln(2t)$ to a variable.. Use the subs command to find the velocity at t=5.
5. Assign velocity of a body to $5e^{-t}+\text{Sin}(2t)$. Use the diff and subs command to find the acceleration at t=5.
6. Find the distance covered by the body between t=2 and t=5 if the velocity of the body is given by $v(t)=5\ln(t)\,\text{Sin}^2(2t)$.
7. Find a time (t>0) when the velocity of a body is 10 m/s if velocity of the body is given by $v(t)=5t^3+4t^2+6$.
8. Plot velocity as a function of time: $v(t)=5t^3+4t^2+6$ from t=0 to t=10. Suppress all outputs. The plot needs to have a title and labeling of the axes.