Design Project #1

FORMAT of the file to be submitted:

1. All the m-files should be named as pr1.m.
2. The results (figure, table, or individual result such as x = 2.653, …, and any comment) should be placed in a WORD file named as yourlastname_DP_01.doc
3. All the m-files should be inserted at the end of the WORD file using COURIER 9 font.
4. The WORD file and all the m-files should ZIPPED together, and the file should be named as yourlastname_DP_01.zip or (or alternatively as yourlastname_DP_01.rar).
5. Place the file to the following folder:
   F:\COURSES\UGRADS\MECH\MECH307\HOMEWORK\...
6. During the presentation, you will be asked to enter particular values for the parameters of the problem; and then run your code and present your results in terms of figures, tables, etc. Thus, when you go to the TAs office/lab, please have your laptop turned on, and make your Matlab code(s) ready to be run.

Write a Matlab code to do the following:

- ❑ Enter a domain for x, a <= x <= b (in a single line, line #4)
- ❑ Enter a function, f(x) in that selected x domain (in a single line , line #5)
- ❑ Enter n number of arbitrary x = X values within the selected domain (in a single line , line #6)
- ❑ Draw the followings on the same graph:
  - ✓ f(x) vs x curve
  - ✓ n circles at (X, f(X)) each having a radius, R = Radius of curvature at X (clearly show the center and R of each circle)
  - ✓ Tabulate X, f(X), x_c, f_c and R where (x_c, f_c) is the coordinates of the center of each circle, and R is its radius.
  - ✓ Use axis equal so that tic marks are equally s
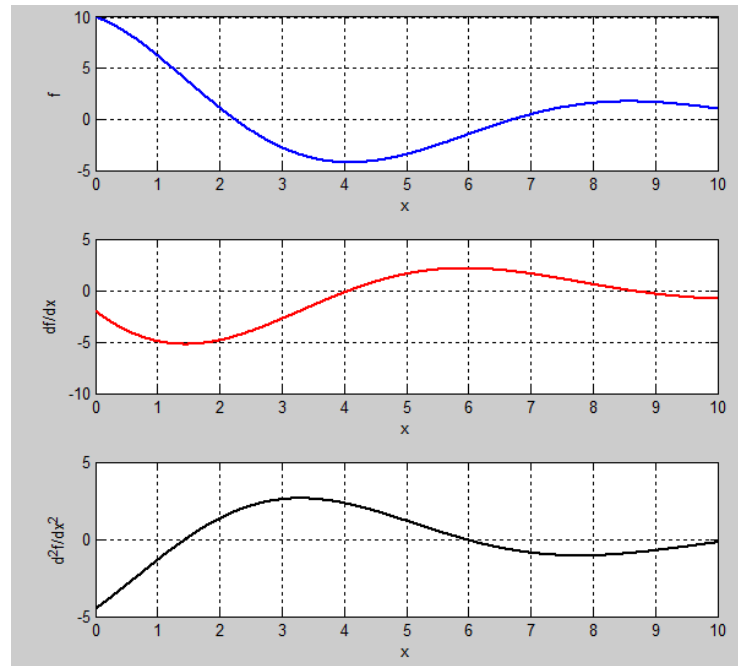 - ✓ circles which are tangent to the paced in every direction.

Make sure that your code works correctly.

Here is what you need to supply (along with regular WORD file and MATLAB file zipped together):

- ❑ Use the following test case; we later check if your code works in general:

$$f(x) = 10\cos(0.7x)\, e^{-0.2x} \quad \text{on } 0 \le x \le 10 \qquad \texttt{X = [4.2 4.8 6.8 8.0]}$$

Test Case:

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X	F	x_c	f_c	R
4.2000				
4.8000	?	?	?	?
6.8000				
8.0000				