Homework 7.3 – Graph Analysis with the TI-84

1. (1 pt) alfredLibrary/AUCI/chapter7/lesson3/expreg1pet.pg

(a) Enter the data below into your graphing calculator and view the scatter plot. Conclude that the data is exponential.

t	y
0	16.8218
4	34.8934
8	71.968
12	146.241
16	302.138
20	625.15
24	1279.62

(b) Use your calculator to find an exponential model for the data.

$y(t) =$ _____

(c) Graph your model over the scatter plot. Is it a good fit?

(d) Use the options under the "calculate" menu to find the rate of change of your model at $t = 12$.

$y'(12) =$ _____

2. (1 pt) alfredLibrary/AUCI/chapter7/lesson3/zeros1pet.pg

Use your graphing calculator to approximate to two decimal places the real solutions to the equation

$$x^4 + 0.24x^3 + 3.9055x^2 + 0.96x - 0.378 = 0.$$

$x =$ _____

Note: If there is more than one solution, enter them as a comma-separated list.

3. (1 pt) alfredLibrary/AUCI/chapter7/lesson3/increasedecrease1pet.pg

Consider the function

$$f(x) = -10x^3 + 45x^2 + 1620x + 6$$

Use your graphing calculator to find the critical points of f, then fill in the following information:

(a) The graph of f is increasing on the open interval (___ , ___).

(b) The graph of f is decreasing on the open interval ($-\infty$, ___) and the open interval interval (___, ∞).

(c) The graph of f has a local maximum at $x =$ _____.

4. (1 pt) alfredLibrary/AUCI/chapter7/lesson3/graph1pet.pg

Suppose that

$$f(x) = 9x^2 \ln(x), \quad x > 0.$$

Use the appropriate options under the "calculate" menu of your graphing calculator to determine the following information.

(a) List the x-values of all critical points of f. If there are no critical points, enter 'NONE'.

Critical points = _____

(b) List the x-coordinates of all local maxima of f. If there are no local maxima, enter 'NONE'.

x-values of local maxima = _____

(c) List the x-coordinates of all local minima of f. If there are no local minima, enter 'NONE'.

x-values of local minima = _____

(d) Use interval notation to indicate where f is increasing.

Note: Use 'INF' for ∞, '-INF' for $-\infty$, and use 'U' for the union symbol.

Increasing: _____

(e) Use interval notation to indicate where f is decreasing.

Decreasing: _____

For the next three parts, find $f'(x)$ and graph it on your calculator.

(f) List the x-values of all inflection points of f. If there are no inflection points, enter 'NONE'.

x-values of inflection points = _____

(g) Use interval notation to indicate where f is concave up.

Concave up: _____

(h) Use interval notation to indicate where f is concave down.

Concave down: _____