MTH232

Applications of Definite Integration Using the Symbolic Math Toolbox

Project 2– Exercises

NAME: _____
SECTION: _____
INSTRUCTOR: _____

Exercise 1:
Find all the zeros of $f(x) = 4 * x^3 - x^2 - 4 * x + 1$
(1) Answer: _____

Exercise 2:
Use MATLAB to find the critical numbers, absolute extrema, graph with key points labeled for $f(x) = x^2 e^{x/3}$ on interval [-8,2]. Submit the completed graph.

a.) The critical numbers are:
(2) Answer: _____

b.) $Absolute$ max:
(3) Circle one: **1.** the point $(0, 0)$
2. the point $(-6, 36e^{-2})$
3. the point $(2, 4e^{2/3})$
4. none of the above

c.) Absolute min:
(4) Circle one: **1.** the point $(0, 0)$
2. the point $(-6, 36e^{-2})$
3. the point $(2, 4e^{2/3})$
4. none of the above

d.) Submit the graph.
(5) **Attach your graph to the worksheet.**

Exercise 3:
Given, $f(x) = x^4 + 4x^3 + 4x^2 + 4$.
Use MATLAB to find:

a.) zeros
(6) Circle one: **1.** where x=0 **2.** where x=1 **3.** there are no zeros **4.** none of the above

b.) critical numbers
(7) Answer: _____

c.) Relative max using the Second Derivative Test. (Note that fpp can be found by using either diff(fp) or diff(f,2). The 2 in diff(f,2) means differentiate twice).
x=
(8) Answer: _____

d.) Relative min(s)? $x =$
(9) Answer: _____

e.) Find $f''(x_{r.max}) =$
(10) Answer: _____

f.) Find $f''(x_{r.min}) =$
(11) Answer: _____

g.) Submit the graph labeled with min and max. (use "text" command.)
(12) **Attach your graph to the worksheet.**

Exercise 4:
Use MATLAB to graph, find and label points of intersection and determine the area between $f(x) = x^2 + x + 8$ and $g(x) = x + 12$.

a.) Points of intersection (x coordinates):
x=
(13) Answer: _____

b.) the area is:
(14) Answer: _____

c.) Submit the graph
(15) **Attach your graph to the worksheet.**

Exercise 5:

(a) Graph the region bounded by $y = \sqrt{x+5}$, $x - axis$, $x = 1$ and $x = 5$
Submit the Graph:
(16) **Attach your graph to the worksheet.**

(b) Find the volume when the region is rotated around the x-axis.
(17) Circle one: 1. 16π **2.** 32π **3.** 14π **4.** 18π

Exercise 6:
The region bounded by $y = x^3$ and $y = 2x^2$ is rotated around the y-axis.

(a) graph the region. *Note: do not plot the functions outside of the intersection points!*
(18) **Attach your graph to the worksheet.**

(b) find the volume
(19) Circle one: 1. 16π **2.** $8\pi/5$ **3.** $8\pi/3$ **4.** $16\pi/5$