MATH 116 — PRACTICE FOR EXAM 1

Generated September 16, 2020

NAME: _____

INSTRUCTOR: _____   SECTION NUMBER: _____

1. This exam has 2 questions. Note that the problems are not of equal difficulty, so you may want to skip over and return to a problem on which you are stuck.

2. Do not separate the pages of the exam. If any pages do become separated, write your name on them and point them out to your instructor when you hand in the exam.

3. Please read the instructions for each individual exercise carefully. One of the skills being tested on this exam is your ability to interpret questions, so instructors will not answer questions about exam problems during the exam.

4. Show an appropriate amount of work (including appropriate explanation) for each exercise so that the graders can see not only the answer but also how you obtained it. Include units in your answers where appropriate.

5. You may use any calculator except a TI-92 (or other calculator with a full alphanumeric keypad). However, you must show work for any calculation which we have learned how to do in this course. You are also allowed two sides of a $3'' \times 5''$ note card.

6. If you use graphs or tables to obtain an answer, be certain to include an explanation and sketch of the graph, and to write out the entries of the table that you use.

7. You must use the methods learned in this course to solve all problems.

Semester	Exam	Problem	Name	Points	Score
Winter 2019	1	9		6	
Winter 2018	1	8		14	
Total				20	

Recommended time (based on points): 18 minutes

9. [6 points] Below are the graphs of four functions. Note that the vertical scales are not given and may not be the same.
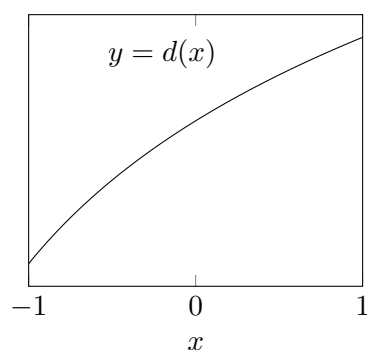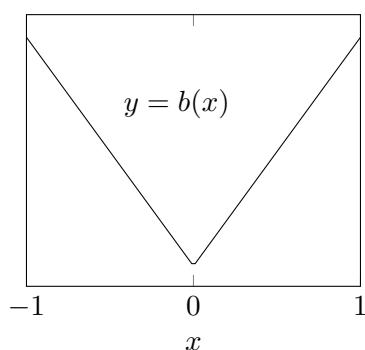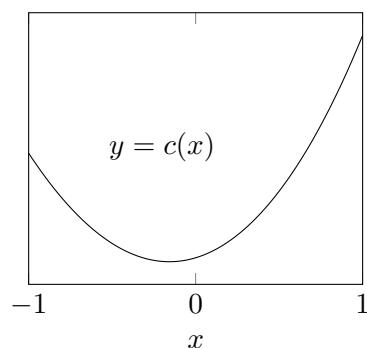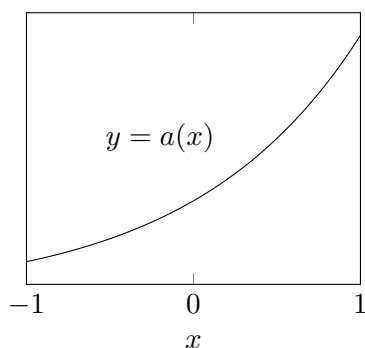
We have calculated $\mathrm{LEFT}(6), \mathrm{RIGHT}(6), \mathrm{TRAP}(6)$, AND $\mathrm{MID}(6)$ for the definite integral of each of three of these functions on the interval $[-1, 1]$. These estimates are listed below. For each one, circle the corresponding function.

(i)

LEFT(6)	1.21875
RIGHT(6)	1.58496
MID(6)	1.40185
TRAP(6)	1.29890

Function: $a(x)$ $c(x)$

$b(x)$ $d(x)$

(ii)

LEFT(6)	5.1552
RIGHT(6)	8.0374
MID(6)	5.0882
TRAP(6)	6.5963

Function: $a(x)$ $c(x)$

$b(x)$ $d(x)$

(iii)

LEFT(6)	42.00
RIGHT(6)	42.00
MID(6)	42.00
TRAP(6)	42.00

Function: $a(x)$ $c(x)$

$b(x)$ $d(x)$

8. [14 points] Let $g(x)$ be a differentiable function with domain $(-1, 10)$ where some values of $g(x)$ and $g'(x)$ are given in the table below. Assume that all local extrema and critical points of $g(x)$ occur at points given in the table.

x	0	1	2	3	4	5	6	7	8
$g(x)$	2.0	3.3	5.7	6.8	6.0	4.3	2.4	0.2	-4.9
$g'(x)$	2.8	2.5	2.0	0.0	-1.4	-1.9	-1.6	-3.0	-8.1

a. [3 points] Estimate $\int_0^8 g(x)\,dx$ using RIGHT(4). Write out each term in your sum.

b. [4 points] Approximate the area of the region between $g(x)$ and the function $f(x) = x + 2$ for $0 \le x \le 4$, using MID(n) to estimate any integrals you use. Use the greatest number of subintervals possible, and write out each term in your sums.

c. [3 points] Is your answer to **b.** an overestimate, an underestimate, or is there not enough information to tell? Briefly justify your answer.

Answer: (circle one)

OVERESTIMATE   UNDERESTIMATE   NOT ENOUGH INFORMATION

d. [4 points] Write an integral giving the arc length of $y = g(x)$ between $x = 2$ and $x = 8$. Estimate this integral using TRAP(2). Write out each term in your sum.

Answer: Integral: _____

Answer: TRAP(2)= _____