MAT 123: Introduction to Calculus

Exam 2, Fall 2007

Directions: Do not turn this page over until you are directed to do so. Please fill in your name, Stony Brook ID number, and your recitation number on the lines below. Please then circle the recitation/evening lecture you belong to in the chart below. There are a total of 8 pages to this exam, not including the cover sheet. Be sure to have all of them. There are seven questions on this exam. Point values for each question are shown in brackets to the right of the question number. There are 100 possible points one can earn on this exam. You may not leave the exam room until 9:00pm at the earliest. You may *not* use a calculator or any other electronic device for this exam. You may not consult any outside resources, including fellow test-takers, notes, and textbooks. You will also not receive any information from the proctors regarding the wording of any of the exam questions.

Name: _____ **ID#:** _____ **Rec#:** _____

R01	Michael	M	2:20p	R02	Claudio	W	11:45a	R03	Deanna	Tu	2:20p
R04	James	Tu	11:20a	R05	Michael	M	11:45a	R06	Michael	F	8:30a
R07	Deanna	M	2:20p	R08	Paul	M	12:50p	R10	Suren	Tu	3:50p
R11	Jason	M	11:45a	R12	Suren	Tu	5:20p	R13	Dustin	W	2:20p
R14	William	W	6:50p	R15	Jason	Tu	2:20p	R16	Sarah	Th	2:20p
R17	Claudio	W	10:40a	R20	Sarah	F	12:50p	R21	Danielle	W	10:40a
R22	Frank	Tu	8:20a	R23	Katherine	M	12:50p	R24	Danielle	W	11:45a
R25	Daniel	M	2:20p	R26	Deb	Th	12:50p	R27	Raquel	Tu	11:20a
R30	Adam	Th	3:50p	R31	Adam	Th	6:50p	R33	William	Th	11:20a
R34	Krystle	Tu	12:50p	R35	Krystle	M	10:40a	ELC90	Peter	MW	6:50p
ELC91	Nick	TuTh	6:50p								

QUESTION	1	2	3	4	5	6	7	Total
POSSIBLE PTS	10	20	10	10	30	10	10	100
PTS AWARDED								

1. Match the following five equations:

$(2 \times 5 = 10$ points.$)$
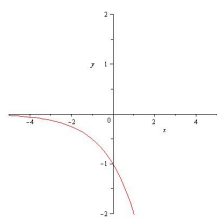
(a) $y = 2^{-x}$

(b) $y = -2^{-x}$

(c) $y = \log(x)$

(d) $y = 2^{x}$

(e) $y = -2^{x}$

with the following five graphs:
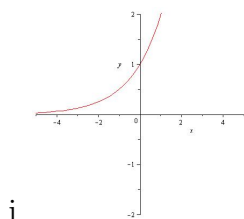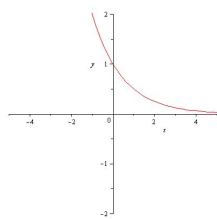
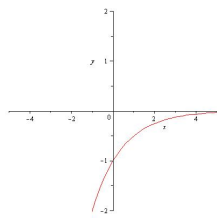i   this graph corresponds to the equation.......

ii   this graph corresponds to the equation.......
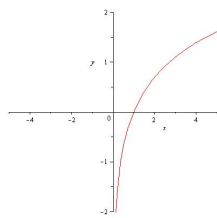
iii   this graph corresponds to the equation.......

iv   this graph corresponds to the equation.......

v   this graph corresponds to the equation.......

2. Evaluate the following expression:

$(5 \times 4 = 20$ points $)$

(a) $\log_5 25$

(b) $\ln(e^5)$

(c) $3^{(\log_3 7)}$

(d) $\log_3(3^7)$

(10 points)

3. Solve for x:

$$5^{2x+1} = 7^{x-1}$$

(10 points)

4. Solve for x:

$$\log_9(x-5) + \log_9(x+3) = 1$$

(30 points)

5. Consider the following rational function

$$f(x) = \frac{3x - 6}{x + 1}$$

(a) Find x intercept of $f(x)$.   [5 points]

(b) Find y intercept of $f(x)$.   [5 points]

(c) Find all horizontal asymptotes of $f(x)$ [5 points]

(d) Find all vertical asymptotes of $f(x)$ [5 points]

(e) Using all the information above, sketch the graph of $f(x)$.

[10 points]

[10 points]

6. An open box is made from a square piece of cardboard 24 inches on a side by cutting identical squares from the corners and turning up the sides. See the picture below:
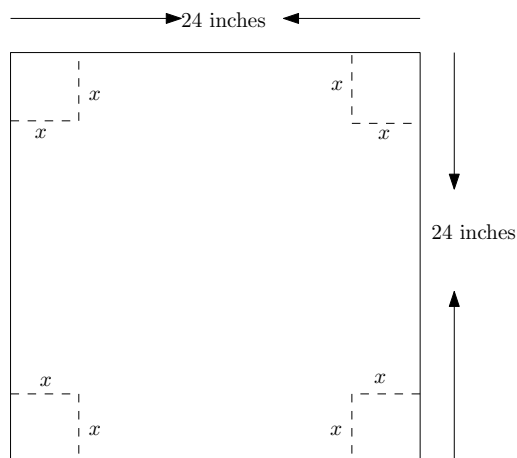
(a) Express the volume of the box, V, as a function of the length of the side of the square cut from each corner, x.

[8 points]

(b) Find the domain of the function, $V(x)$, that you found in the previous step

[2 points]

$(2 \times 5 = 10 \text{ points })$

7. If $\log_a b = 2$ and $\log_a c = 4$, find the numeric value of the following two expressions:

(a) $\log_a(b^2 c^3)$

(b) $\log_b c$