Math 122- Frequently Missed Exam Questions

Name:

Due: May 1, 2018 (5:00 PM)

Instructions: This assignment is due to my mailbox on the 4th floor of LeConte. Each question has a point value. Unless otherwise specified, you are required to **SHOW ALL YOUR WORK** to receive full credit. Only solutions that are **near perfect** will receive credit. All points earned will be added to your final exam score. You are welcome to discuss the questions with your classmates and the instructor; however, **all work must be your own and reflect your understanding of the material.**

1 Exam 1

(1 pt) Problem 7, Section 1.6. Decompose (simplify) the following logarithm as much as possible using the rules of logarithms. Clearly justify each simplification with the appropriate rule of logarithms.

$$\log_5\left(\frac{(x^3+y^5)\sqrt[7]{z}w^2}{(x+y)z^5}\right)$$

(2 pts) Problem 8, Sections 1.5-1.6. Solve the following exponential and logarithmic equations. Clearly justify each step with the appropriate rule of exponents or logarithms.

(a) $8^{x^2} = 8^{3x+10}$

(b)

$$\log_2\left(\log_2\left(\log_2(2^{4^x})\right)\right) = 3$$

Note: The exponent is 4^x, NOT $4x$.

(1 pt) Problem 9, Section 1.7. Suppose the population of Kenya was 19.5 million in 1984 and 39.0 million in 2009. Assuming the population increases exponentially, find a formula for the population of Kenya as a funcion of time (where t is the number of years since 1980).

2 Exam 2

(1 pt) Problem 3, Sections 3.3-3.4. Suppose $f(1) = 2$ and $f'(1) = -3$. If $g(x) = \sqrt{f(x)}$, determine $g'(1)$.

(1 pt) Problem 10, Section 4.1. Find the constants a, b such that the minimum for the parabola $f(x) = x^2 + ax + b$ is at the point $(3, 9)$.

3 Exam 3

(1 pt) Problem 1, Section 4.3. An individual seeks to enclose a rectangular 1000 square foot plot of land. The fence for the first three sides costs \$22 per foot, and the fence for the remaining side costs \$13 per foot. Determine the minimum cost to enclose the fence.

(1 pt) Problem 2, Section 4.4 At a price of \$10 per ticket, a musical theater group can fill every seat in the theater, which has a capacity of 1300. For every additional dollar charged, the number of people buying tickets decreases by 50. What ticket price maximizes revenue?

(1 pt) Problem 7, Section 4.3. Find all global maxima and minima of the following function. If no global maxima or minima exist, clearly justify why this is the case.

$$f(x) = 3x - 3\ln(x) \text{ for } x > 0.$$