Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 3 – November 2016

Directions: You will find 13 problems listed below. No notes/books/friends are allowed. Graphing calculator models above the level of a TI-84 plus are not allowed. You have one hour to complete this exam.

# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	TOTAL

1. (a) (6 points) Find $f^{-1}(x)$ when $f(x) = 5x + 1$.

(b) (6 points) Find $g^{-1}(x)$ when $g(x) = \log_4(7x + 3)$.

2. (8 points) Given $g(x) = x^2 + 2x - 1$ and $h(x) = 3x + 4$, find $g(h(x))$ and write your answer in the form $ax^2 + bx + c$.

3. (6 points) Using the values $\log(a) = 1.6$ and $\log(b) = 2.4$, find $\log\left(\sqrt{a^3 b}\right)$.

4. (6 points) Solve: $2 + \ln(x - 1) = 9$. Leave answers exact (in other words, don't use a calculator).

5. (8 points) Condense into a single logarithmic expression using the properties of logarithms (you may assume that x is positive): $\log_4(x) + \log_{16}(x+5)$. (Hint: Change of base formula).

6. (8 points) Find the domain of the function $f(x) = \sqrt{x^2 + 7x - 8}$

7. (8 points) Solve the rational inequality: $\dfrac{x-6}{x+1} < 0$. Be sure to include either a case analysis, or, a number line justifying how you arrived at the answer.

8. (4 points each, no partial credit) Fill in the blank:

   (a) $\log_b\left(\sqrt{b}\right) =$ _____

   (b) $\log_5\left(\dfrac{1}{125}\right) =$ _____

   (c) $\ln(e^3) =$ _____

9. (6 points) The supply function for a certain product is given by $p = 40 \cdot (3^q)$, where p is the price of the product and q is the quantity supplied at that price. If the price of the product is \$3240, how many units will be supplied?

10. (6 points) Find the domain of the function $f(x) = \log(3x - 2)$.

11. (6 points) Suppose $R(t) = 3t + 2$ is a function that gives the radius of a circular oil spill at t minutes. Given $A(r) = \pi r^2$, find an expression for $A(R(t))$, and leave your final answer in terms of π.

12. (6 points) Solve: $4 + 9e^x = 10$. Leave answers exact (in other words, don't use a calculator).

13. (8 points) Solve the following rational equation: $\dfrac{x+3}{x+57} = \dfrac{x+6}{5x-1}$