Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 3 – November 10, 2015

Directions: You will find 12 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	TOTAL

1. (a) (6 points) Find $f^{-1}(x)$ when $f(x) = \dfrac{5x+1}{2}$.

   (b) (6 points) Find $g^{-1}(x)$ when $g(x) = \log_3(2x+7)$.

2. (10 points) Condense into a single logarithmic expression: $\log_6(x) + \log_{36}(x+1)$. (Hint: Change of base formula).

3. (8 points) Using the values $\log(a) = 1.4$ and $\log(b) = 2.2$, find $\log\left(\sqrt{ab^3}\right)$.

4. (8 points) Solve the following rational equation: $\dfrac{3x-4}{x-1} = \dfrac{6x}{2x-3}$

5. (8 points) Solve: $5 + \ln(x + 2) = 7$. Leave answers exact (in other words, don't use a calculator).

6. (8 points) Solve: $2 + 7e^x = 11$. Leave answers exact (in other words, don't use a calculator).

7. (3 points each, no partial credit) Fill in the blank:

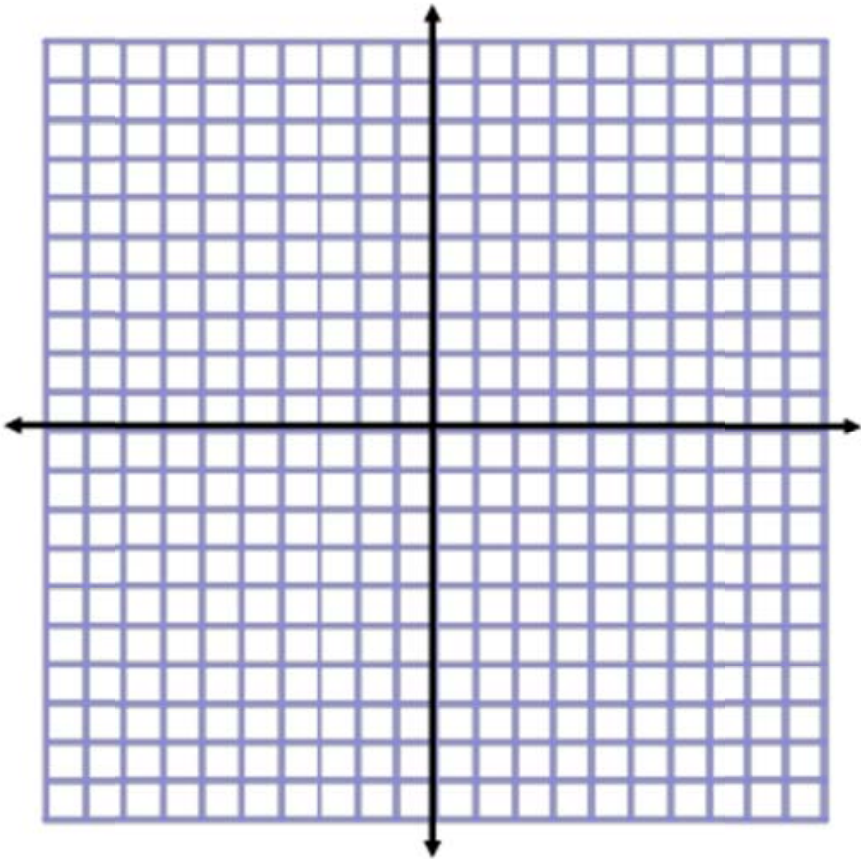
   (a) $\log_b\left(\sqrt{b}\right) =$ _____

   (b) $\log_3\left(\frac{1}{243}\right) =$ _____

   (c) $\ln(e^6) =$ _____

8. (8 points) Given $g(x) = x^2 - 5x - 1$ and $h(x) = -3x + 4$, find $g(h(x))$ and write your answer in the form $ax^2 + bx + c$.

9. (8 points) Solve the inequality by graphing: $\sqrt{x+7} > 3$



10. (8 points) Solve the rational inequality: $\dfrac{x-5}{x+3} < 0$.

11. (5 points) Find the domain of the function $f(x) = \log(6x + 11)$.

12. (2 points each, no partial credit, even if you mix up answers between parts.) Consider the rational function $r(x) = \dfrac{16x^2 + 8x + 1}{4x^2 - 1}$.

    (a) What is the domain of $r(x)$?

    (b) What are the zero(s) of $r(x)$?

    (c) What is the y-intercept of $r(x)$?

    (d) Does $r(x)$ have a horizontal asymptote? If so, what is it?