Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 3 – Summer 2016

Directions: You will find 15 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.

Page 1 20 pts.	Page 2 20 pts.	Page 3 20 pts.	Page 4 20 pts.	Page 5 20 pts	TOTAL 100 pts

1. (7 points) Find $f^{-1}(x)$ when $f(x) = 7x + 2$.

2. (7 points) Given $g(x) = 6x^2 - 4x$ and $h(x) = x + 2$, find $g(h(x))$.

3. (6 points) Expand completely using properties of logarithms (you may assume all variables to be positive): $\log\left(w^2 z x \sqrt{y}\right)$

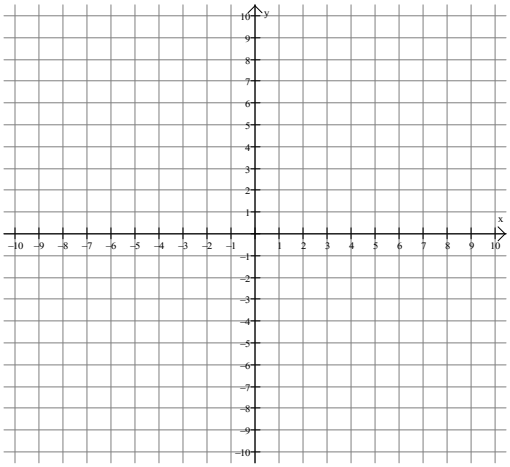
4. (8 points) Solve the following rational equation: $\dfrac{x+7}{x+13} = \dfrac{x-3}{5x-1}$

5. (6 points) Solve and check: $2x - 4 = \sqrt{10x + 30}$

6. (6 points) Simplify i^{245}.

7. (6 points) Condense into a single logarithmic expression using the properties of logarithms (you may assume that x is positive): $\log(x) + \dfrac{1}{7}$

8. (5 points) Solve the inequality by graphing: $\sqrt{x-3} \geq 1$



9. (9 points) Fill in the blank:

(a) $\log_2\left(\dfrac{1}{16}\right) =$ _____

(b) $\log_9(81) =$ _____

(c) $\log_a(a^3) =$ _____

10. (8 points) Given that $x = -1$ is one zero of $p(x) = x^3 + 1$, find all the other zeros, real or complex, of $p(x)$.

11. (6 points) Find the domain of the function $g(x) = \sqrt{x^2 - 6x}$.

12. (6 points) Solve the rational inequality $\dfrac{x+1}{x-5} \geq 0$, remembering to check endpoints.

13. (6 points) Simplify and write in standard $a + bi$ form: $(2 - 5i)(3 + 8i)$

14. (6 points) Find the domain of the function $f(x) = \log(3x + 7)$.

15. (8 points) Consider the rational function $r(x) = \dfrac{x^2 - 6x}{x^2 - 10x + 9}$. Answer the following questions.

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

    (b) What are the zeros of $r(x)$?

    (c) What are the poles (vertical asymptotes) of $r(x)$?

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