Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 3 – Summer 2017

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

1. (7 points) Find $f^{-1}(x)$ when $f(x) = 2x - 9$.

2. (7 points) Given $g(x) = 5x^2 - 2x$ and $h(x) = x + 4$, find $g(h(x))$.

3. (6 points) Expand completely using properties of logarithms (you may assume all variables to be positive): $\log\left(wz^3x\sqrt{y}\right)$
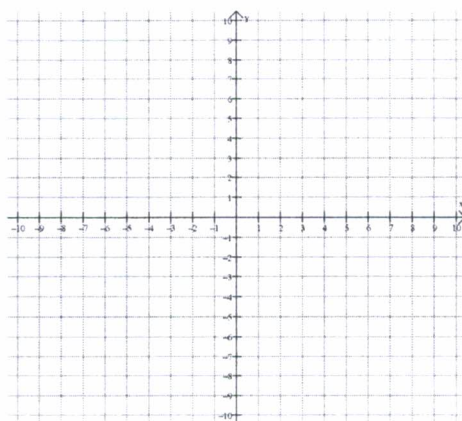
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4. (8 points) Solve the following rational equation: $\dfrac{7}{x+3} = \dfrac{4}{5x-1}$

5. (6 points) Solve and check: $x + 1 = \sqrt{6x+1}$

6. (6 points) Simplify i^{257}.

7. (6 points) Condense into a single logarithmic expression using the properties of logarithms (you may assume that x is positive): $\ln(x) + \dfrac{1}{4}$

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}{32}\right) = $ _____

(b) $\log_9(729) = $ _____

(c) $\log_a(a^4) = $ _____

10. (8 points) Given that $x = -2$ is one zero of $p(x) = x^3 + 8$, find all the other zeros, real or complex, of $p(x)$.

11. (6 points) Find the domain of the function $g(x) = \sqrt{x^2 + 7x}$.

12. (6 points) Solve the rational inequality $\dfrac{x+2}{x-7} \geq 0$, remembering to check endpoints.

13. (6 points) Simplify and write in standard $a + bi$ form: $(3 - 4i)(6 + 7i)$

14. (6 points) Find the domain of the function $f(x) = \log(3x + 8)$.

15. (8 points) Consider the rational function $r(x) = \dfrac{x^2 - 7x}{x^2 - 10x + 24}$. 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?