Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 3 – April 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 $f(x) = 4x - 7$.

2. (7 points) Given $g(x) = x^2 - 4x - 2$ and $h(x) = x + 3$, find $g(h(x))$.

3. (6 points) Expand completely using properties of logarithms (you may assume all variables to be positive): $\log\left(\frac{x\sqrt{y}}{5}\right)$

4. (8 points) Solve the following rational equation: $\dfrac{x^2+6x+15}{x} = \dfrac{x^2-7x+12}{x}$

5. (6 points) Solve and check: $x - 4 = \sqrt{16-4x}$

6. (6 points) Simplify i^{523}.

7. (9 points) Fill in the blank:

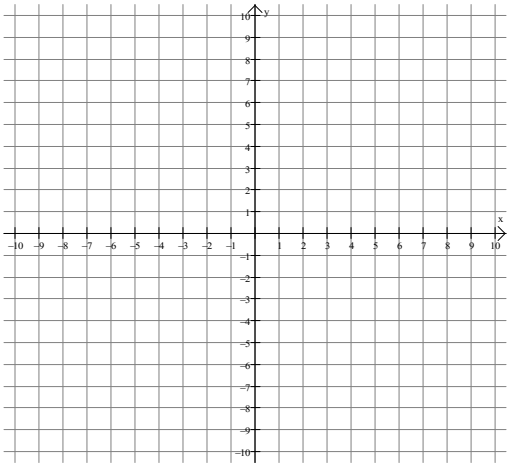
   (a) $\log_3\left(\frac{1}{81}\right) =$ _____

   (b) $\log_4(64) =$ _____

   (c) $\log_b(\sqrt{b}) =$ _____

8. (6 points) Condense into a single logarithmic expression using the properties of logarithms (you may assume that x is positive): $\ln(x) + \frac{1}{5}$

9. (5 points) Graph the function $f(x) = \sqrt{x+3}$ on the graph below, include at least 4 points on this graph. Then, state the domain and range of this function in the spaces given below.



   (a) Domain: _____

   (b) Range: _____

10. (8 points) Given that $x = -2$ is one zero of $p(x) = 2x^3 + 16x^2 + 60x + 72$, find all the other zeros, real or complex, of $p(x)$.

11. (6 points) Find a 3rd degree polynomial with zeros at $x = 1$, $x = -1$ and $x = 4$. You need not multiply out the answer.

12. (6 points) Solve the rational inequality $\dfrac{x+5}{x-3} \leq 0$, remembering to check endpoints.

13. (6 points) Simplify and write in standard $a + bi$ form: $(-7 + i)(3 - 5i)$

14. (6 points) Find the domain of the function $f(x) = \log(-23x + 14)$.

15. (8 points) Graph the function $r(x) = \dfrac{9 - x^2}{x + 3}$. (Hint: You had many homework problems similar to this question.)