Math 111I-006 Basic College Mathematics Exam #3
November 24, 2014

Instructor: Ann Clifton Name: _____

Answer the following questions. *You must show your work to receive full credit.* Be sure to make reasonable simplifications. Give exact answers unless otherwise specified. Indicate your final answer with a box.

1. State the formula for the amount of money, $A(t)$, after t years if P dollars is invested at a rate of r compounded n times per year.

2. For a function to have an inverse, it must be _____.

3. Let $f(x)$ be a function and assume it has an inverse, $f^{-1}(x)$. Then $f(f^{-1}(x)) = f^{-1}(f(x)) =$_____, the _____ function.

4. Find $f^{-1}(x)$ if $f(x) = \ln x - 4$. Check to make sure your answer is correct.

5. Solve for x: $\log_x 8 + \log_x 2 + 1 = 3$

6. Find the function $f(x) = Ca^x$ given the following two points on the graph: $(2, \frac{7}{9})$ and $(0, 7)$.

7. Let $f(x) = -3x^2 + 6x + 9$.

(a) Write the function in Standard Form by completing the square. Using the basic function $y = x^2$, what transformations (horizontal, vertical, etc) give the function $f(x) = -3x^2 + 6x + 9$?

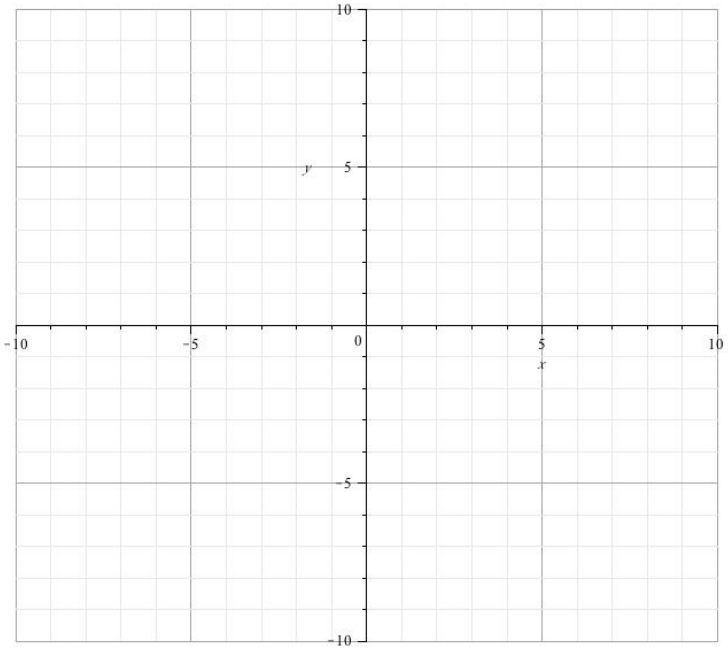
(b) What is the vertex of the parabola?

(c) Does the function have a maximum or a minimum value? What is the maximum/minimum value?

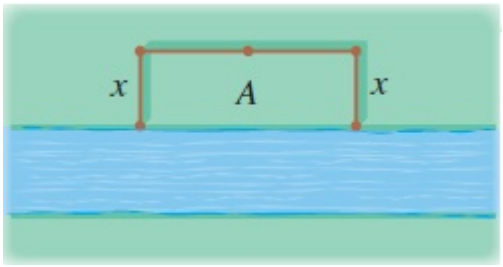
(d) Calculate the discriminant. How many x-intercepts does the function have?

(e) Find the x- and y-intercepts. If there are none, write NONE.
x-intercepts:_____
y-intercept:_____

(f) Using parts (a)-(e), sketch a graph of the function. Be sure to label the vertex and intercept(s).



8. **Bonus (+5 points)** Blake has 1800 feet of fencing with which she wants to fence off a rectangular field that borders a straight river. She does not need a fence along the river (see the figure).



What are the dimensions of the largest area she can fence? What is the largest area that can be fenced?

9. **Bonus (+5 points)** What was my costume for Halloween?