

Math 111
Final Exam Review

Name _____

Be prepared to answer all the questions from the previous two test and the following problems.

1. Let $f(x) = \frac{1}{(x+3)}$ and $g(x) = x+3$.

Find and state the domain for the following: (30 points)

a) $(f+g)(x) =$

domain =

b) $(fg)(x) =$

domain =

c) $(f \circ g)(x) =$

domain =

2. Let $f(x) = 3x + 2$ (20 points)

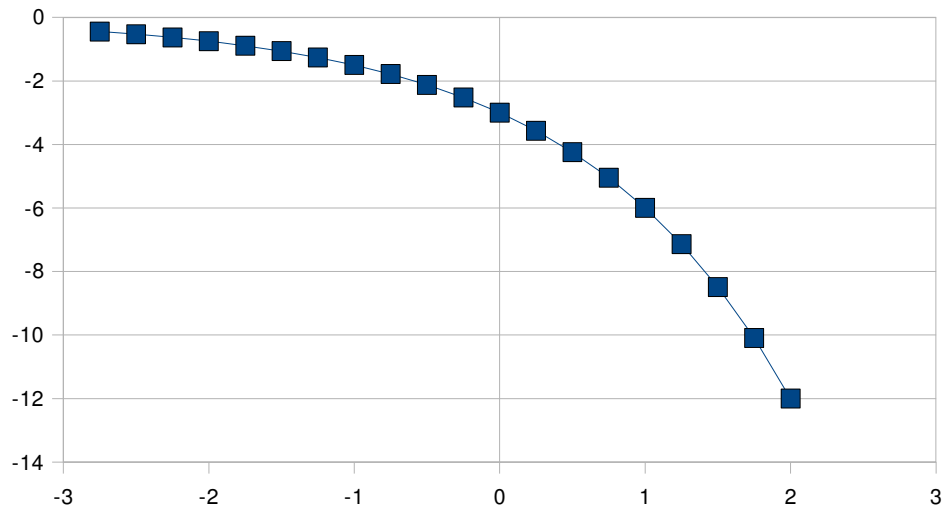
a) Verify that f is a one-to-one function: (graphically or algebraically)

b) Since $f(x)$ is one-to-one it has an _____?

c) Find the inverse of $f(x)$.

d) Verify your answer in part c is in fact the inverse of $f(x)$

3. Find the form $f(x) = Ca^x$ whose graph is given by: (15 points)



4. Let $f(x) = 2^x$. What is the domain and range of $f(x)$? (10 points)

domain=

range=

6. Express the following equation in exponential form: (5 points)

$$\ln e^2 = 2$$

7. Express the following in logarithmic form: (5 points)

$$5^3 = 125$$

8. Simplify the following terms: (10 points)

a) $\log_2 2^5$

b) $e^{(\ln 3)}$

9. Expand the logarithmic expressions: (20 points)

a) $\ln(xy)^{10}$

$$\text{b) } \log \frac{a^2}{(b^4 * \sqrt{c})}$$

10. Use the laws of logarithms to combine the expression into a single log and simplify . (20 points)

$$\text{a) } \log(x^2 - 1) - \log(x - 1)$$

$$\text{b) } 3\ln 5 + 2\ln x - \ln(x^2 + 5)$$

11. Solve the equation for x (30 points)

$$\text{a) } e^{(-2x)} = \frac{1}{10}$$

b) $2 + 10^x = 12$

c) $\log(3) + \log(x) = \log(5) + 1$

