

NAME: _____

MATH 11009

HOMEWORK #6 (25 pts)

SPRING 2013

SHOW ALL WORK FOR FULL CREDIT — PLEASE CIRCLE YOUR FINAL ANSWER

DUE: TUESDAY, MARCH 19, AT THE BEGINNING OF CLASS

NO EXCEPTIONS!!!

1. (0.5 pt each) Write each equation in exponential form.

(a) $\log_4 37 = y$

(b) $\ln(x + 2) = -6$

2. (0.5 pt each) Write each equation in logarithmic form.

(a) $3^4 = 81$

(b) $10^{-4} = \frac{1}{10000}$

3. (1 pt each) Evaluate each logarithm. Exact answers only.

(a) $\log_4 64 =$

(c) $\log_{32} 8 =$

(b) $\log_{1/5} 125 =$

(d) $\log_{27} \frac{1}{9} =$

4. (1 pt) Use the Change of Base Formula and a calculator to evaluate $\log_{15} 23$ correct to four decimal places.

5. (1.5 pts) Rewrite the expression as the sum, difference, or product of logarithms, and simplify.

$$\log_4 \left(\frac{\sqrt[3]{x^5 + 3}}{x^4(x - 7)^3} \right)$$

6. (1.5 pts) Rewrite the following expression as a single logarithm.

$$3 \ln x - 5 \ln(x - 6) + \frac{1}{4} \ln(x + 9)$$

7. (1 pt each) Use your knowledge of transformations to compare the graph of the following functions with the graph of $f(x) = 5^x$

(a) $f(x) = 5^{x-4} + 2$

(b) $f(x) = 5^{-x} - 3$

8. (2 pts) Solve for x . Give an exact answer and a decimal approximation accurate to four decimal places.

$$6^{3x-2} = 5$$

9. (2 pts) Solve: $5(3 + e^{4x}) = 40$. Give the exact answer and a decimal approximation accurate to four decimal places.

10. (2.5 pts) Solve: $\log_2 2x + \log_2(x + 3) = 3$

11. (2.5 pts) Solve for x . You must show all work. Exact answer(s) only.

$$\ln(x + 5) - \ln(x - 3) = \ln x$$

12. (2 pts) During a 10-year period of constant inflation, the value of \$200,000 property is given by the equation $v = 200,000e^{0.05t}$ dollars. In how many years will the value of this building be \$254,250? (Give the exact answer and a decimal approximation accurate to two decimal places.)

13. (2 pts) At the end of t years, the future value of an investment of \$25,000 in an account that pays 12% compounded quarterly is

$$A = 25,000 \left(1 + \frac{0.12}{4} \right)^{4t}$$

dollars. In how many years will the investment amount to \$60,000? (Give the exact answer and a decimal approximation accurate to two decimal places.)