
MATH 11010: Exam #4 (Fall 2011)

1. Evaluate. **Exact Answer Only.**

(a) $\log_{16} 64 =$

(b) $\log_{1/125} 25 =$

2. Rewrite each expression in logarithmic form.

(a) $3^{-2} = \frac{1}{9}$

(b) $e^3 = x$

3. Rewrite each expression in exponential form.

(a) $\log_7 3x = 4$

(b) $\ln x = 8$

4. Find the domain of $y = \ln(5 - 3x)$

5. If \$17,250 is invested in an account paying $4\frac{1}{2}\%$ interest per year, compounded monthly, how much will be in the account after 5 years? (Round answer to two decimal places.)

6. Suppose that new parents want to guarantee that their new son will have enough money to attend college. How much money do the parents need to invest today in an account paying 4.75% interest compounded continuously, so that their son has \$85,000 available 18 years from now. (Round answer to two decimal places.)

7. Rewrite the following expression as a single logarithm.

$$2[\ln(x - 2) + 5 \ln(x + 4)] - 3 \ln(x - 7)$$

8. Use the Laws of Logarithms to rewrite the expression in a form with no logarithm of a product, quotient, or power where possible.

$$\ln \frac{(x^3 + 9)}{x^4(2x - 1)^3}$$

9. Solve for x . Give an exact answer and a decimal approximation, accurate to four decimal places.

$$80e^{-0.349x} = 12$$

10. Solve for x . Give an exact answer and a decimal approximation, accurate to four decimal places.

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

11. Solve for x . Give an exact answer and a decimal approximation, accurate to four decimal places.

$$3(4 + e^{3x}) = 42$$

12. Solve for x . Give an exact answer and a decimal approximation, accurate to four decimal places.

$$6e^{4x} - 23e^{2x} + 20 = 0$$

13. Solve for x . You must show all work. Exact answer(s) only.

$$4 - \ln(x + 5) = 0$$

14. Solve for x . You must show all work. Exact answer(s) only.

$$\log 2x + \log(x + 2) = \log(11x - 6)$$

15. Solve for x . You must show all work. Exact answer(s) only.

$$\log_3(14x + 3) - \log_3(x + 5) = 2$$

16. Solve for x . You must show all work. Exact answer(s) only.

$$\ln(x - 5) + \ln(x + 1) = \ln 7$$

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17. Find the inverse for $f(x) = \frac{9x - 4}{3x + 7}$
18. Give an example of a **GRAPH of a function** that is not one-to-one **AND** explain why it is not one-to-one.
19. Given that $\log_a 2 \approx 0.251$, $\log_a 5 \approx 0.581$, $\log_a 7 \approx 0.702$, find
- $$\log_a \frac{40}{7},$$
- if possible. Round answer to three decimal places.
20. Use the Change of Base Formula and a calculator to evaluate $\log_5 9$ correct to four decimal places.

ANSWERS

1. (a) $\frac{3}{2}$ (b) $-\frac{2}{3}$
2. (a) $\log_3 \frac{1}{9} = -2$ (b) $\ln x = 3$
3. (a) $3x = 7^4$ (b) $x = e^8$
4. $x < \frac{5}{3}$ 5. \$21,593.48 6. \$36,149.07
7. $\ln \frac{(x-2)^2(x+4)^{10}}{(x-7)^3}$
8. $\ln(x^3 + 9) - 4 \ln x - 3 \ln(2x - 1)$
9. See HW #7
10. See HW #7
11. See HW #7
12. See HW #7
13. See HW #7
14. See HW #7
15. See HW #7
16. See HW #7
17. $f^{-1}(x) = \frac{7x + 4}{9 - 3x}$
18. Any graph that passes the vertical line test, but fails the horizontal line test will work.
19. 0.632
20. 1.3652