



Name _____ Period _____ Date _____

NON-CALCULATOR SECTION

Vocabulary: Define each word and give an example.

1. Common Logarithm

2. e

3. Inverse Function

Short Answer:

4. Describe how to rewrite an exponential function as a logarithmic function.

5. What is the change of base formula?

Review:

6. Simplify the expression: $\frac{-2x^2}{3xy^3} \cdot \frac{2x^{-1}}{y^{-1}}$ 7. Find $f(g(x))$. $f(x) = 2x^2 - 3$ and $g(x) = 3x + 1$ 8. Solve the equation: $3x^2 + 5 = 2x$



Problems:

****Be sure to show all work used to obtain your answer. Circle or box in the final answer.****

9. Evaluate the following logarithms:

a. $\log_4 64$

b. $\log_6 \left(\frac{1}{36} \right)$

c. $\log_8 2$

d. $\log_{64} 16$

10. Expand using the properties of logarithms:

a. $\log_2 \frac{3y^5}{x^2(y+1)}$

b. $\ln(u^{2/3}v^{-3})$

11. Express as a single logarithm:

a. $\log_b 20 - 2\log_b 6$

b. $3\log 8 - \log x + \frac{1}{3}\log 27$

12. Rewrite $\log_5 3$ in terms of natural logarithms using the change of base formula.13. Write an exponential function of the form $y = a \cdot b^x$ whose graph passes through the points $(1, 7)$ and $(3, 63)$.14. Describe how to transform the graph of $f(x) = 2^x$ into the graph of $g(x) = -.5(2^{x-1}) + 6$

15. Solve the equations:

a. $\log 5x + \log(x-1) = 2$

b. $3^{x-7} = 27^{2x}$

15. c. $3\log_2 x + 1 = 7$

d. $4^{x+1} = \frac{1}{64}$

16. Solve the inequality: $2^{x-2} \geq 0.5^{x-3}$

MULTIPLE CHOICE QUESTIONS

 17. Which expression is equivalent to $\log_3 64$?

A. $3\log 64$

C. $64\log 3$

B. $\frac{\log 3}{\log 64}$

D. $\frac{\log 64}{\log 3}$

 18. Solve the equation for x : $\ln(2x-1) = 2$

A. $x = \frac{2+e}{2}$

C. $x = \frac{2^e + 1}{2}$

B. $x = \frac{2e+1}{2}$

D. $x = \frac{e^2 + 1}{2}$

 19. $\ln 42 = 3.7377$

A. $e^{3.7377} = \ln 42$

B. $e^{3.7377} = 1$

C. $e^{3.7377} = 42$

D. $e^{42} = 3.7377$

 20. Find the domain and vertical asymptote of the function: $g(x) = \ln(x-4)$

A. Domain: $(-4, \infty)$; vertical asymptote: $x = -4$

B. Domain: $(4, \infty)$; vertical asymptote: $x = 4$

C. Domain: $(-\infty, \infty)$; vertical asymptote: none

D. Domain: $(0, \infty)$; vertical asymptote: $x = 0$



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CALCULATOR SECTION

1. Solve the equations:

a. $3^{x-3} = 5$

b. $\ln(3x+4) - \ln(2x+1) = 5$

2. A single-cell amoeba doubles every 4 days. How long would it take one amoeba to produce a population of about 10,000 amoebae?

3. Evaluate $\log_5 27$. Round your answer to three decimal places.4. Find the amount A accumulated after investing a principal $P = \$4800$ for 17 years at an interest rate 6.2% compounded quarterly.



5. Jewel received \$30 from her aunt and uncle for her seventh birthday. Her father deposited it into a bank account for her. Both Jewel and her father forgot about the money and made no further deposits or withdrawals. The table shows the account balance for several years.

Elapsed Time (years)	Balance
0	\$30.00
5	\$41.10
10	\$56.31
15	\$77.16
20	\$105.71
25	\$144.83
30	\$198.43

- a. Use a graphing calculator to find the exponential regression that shows how the elapsed time is related to the balance. Write the equation of best fit.
- b. What is the annual interest rate for this account?
- c. Write a sentence that describes the fit of the model to the data.
- d. Based on the model, estimate the balance in 41 years.