PreCalculus Unit 3 Review

Name_____ Period _____ Date _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the equation.

1) $4^{1+2x} = 64$ 1) _____

2) $27^{4x+5} = 9^{4x}$ 2) _____

Change the exponential expression to an equivalent expression involving a logarithm.

3) $5^x = 125$ 3) _____

Change the logarithmic expression to an equivalent expression involving an exponent.

4) $\log_b 16 = 4$ 4) _____

Find the exact value of the logarithmic expression.

5) $\ln e^3$ 5) _____

6) $\log_4 \frac{1}{64}$ 6) _____

7) $\log_3 \sqrt{3}$ 7) _____

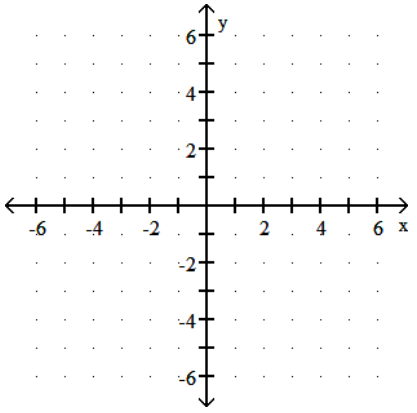
Use the properties of logarithms to find the exact value of the expression. Do not use a calculator.

8) $\log_{144} 8 + \log_{144} 18$ 8) _____

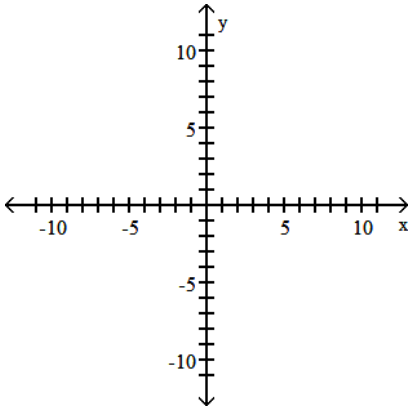
9) $10^{\log 21 - \log 3}$ 9) _____

Graph the function.

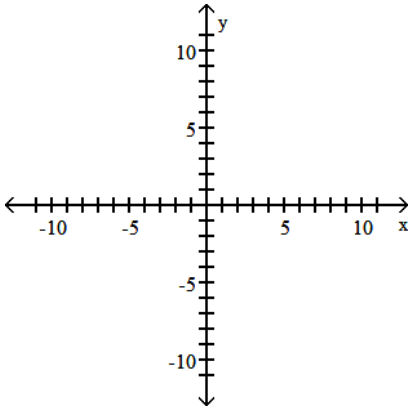
10) $f(x) = 2^{(x + 2)} - 2$. 10) _____



11) $f(x) = \log_4 (x - 2)$ 11) _____



12) $f(x) = 2 + \log_5 x$ 12) _____



Write as the sum and/or difference of logarithms. Express powers as factors.

13) $\log_4 \sqrt{7x}$ 13) _____

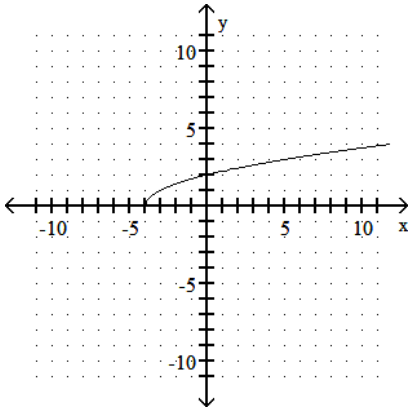
14) $\log_3 \dfrac{\sqrt[2]{p}\,\sqrt[5]{q}}{t^2}$ 14) _____

Express as a single logarithm.

15) $5 \log_c q - \frac{2}{3} \log_c r + \frac{1}{4} \log_c f - 3 \log_c p$ 15) _____

The graph of a one-to-one function f is given. Draw the graph of the inverse function f^{-1} as a dashed line or curve.

16) $f(x) = \sqrt{x + 4}$ 16) _____



For the given functions f and g, find the requested composite function.

17) $f(x) = \sqrt{x + 6}$, $g(x) = 8x - 10$; Find $(f \circ g)(x)$. 17) _____

Decide whether the composite functions, $f \circ g$ and $g \circ f$, are equal to x.

18) $f(x) = \dfrac{x - 2}{2}$, $g(x) = 2x + 2$ 18) _____

Find the inverse function of f. State the domain and range of f.

19) $f(x) = \frac{3x - 2}{x + 5}$ 19) _____

Solve the equation.

20) $\log (4x) = \log 5 + \log (x - 1)$ 20) _____

Solve the equation. Express irrational answers in exact form and as a decimal rounded to 3 decimal places.

21) $\left(4\right)^{x} = 6^{1 - x}$ 21) _____

Find the present value. Round to the nearest cent.

22) To get $25,000 after 10 years at 11% compounded semiannually 22) _____

Solve the problem.

23) The half-life of silicon-32 is 710 years. If 80 grams is present now, how much will be present in 200 years? (Round your answer to three decimal places.) 23) _____

Find the domain of the function.

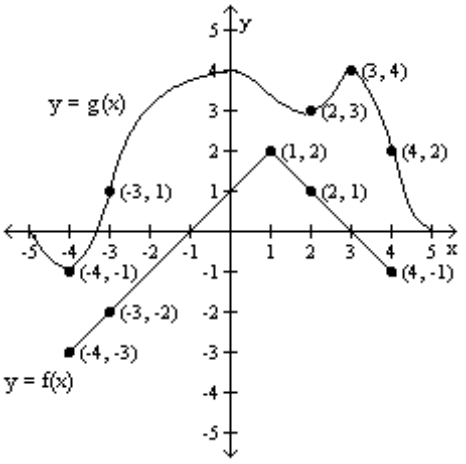
24) $f(x) = \ln(7 - x)$ 24) _____

Solve the equation.

25) $\log_2(3x - 2) - \log_2(x - 5) = 4$ 25) _____

Evaluate the expression using the values given in the table.

26) 26) _____



f(g(-3))

Find the amount that results from the investment.

27) $12,000 invested at 9% compounded quarterly after a period of 3 years 27) _____

Solve the problem. Round your answer to three decimals.

28) How long will it take for an investment to double in value if it earns 7.25% compounded continuously? 28) _____