MATH 116
QUIZ 3

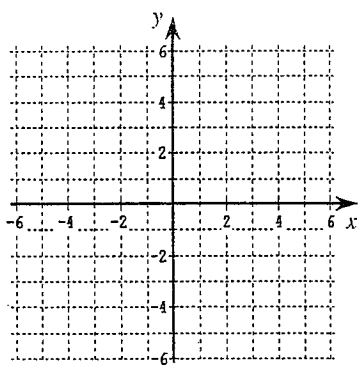
Name _____

Show all work for full credit on any problem. Clearly indicate all answers.

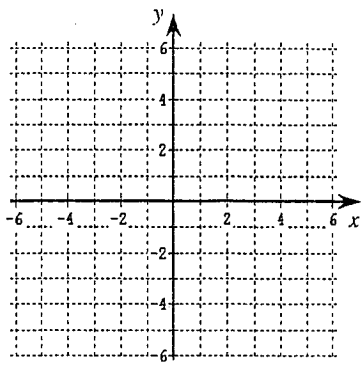
1. Match the graph with the correct function: 1. _____
   a. $y = 4^x - 5$
   b. $y = 4^x + 5$
   c. $y = 4^{-x} + 5$
   d. $y = 4^{-x} - 5$

2. Match the graph with the correct function: 2. _____
   a. $y = 3 + \log x$
   b. $y = 3 \log x$
   c. $y = \log (x + 3)$
   d. $y = 1/3 \log x$

3. Sketch by hand the graphs of $f(x) = 3^x$ and $g(x) = 3^x - 5$ on the same axis. Explain how the graph shifts.




4. Sketch the graph: $f(x) = 1 + \log_5 x$



5. Evaluate $\dfrac{3\ln 5}{7\ln 6 - 2\ln 7}$ 5. _____

a. -3.882
b. 0.5582
c. -11.6058
d. 2.6559
e. None of these

6. Evaluate using the change of base formula: $\log_4 7$ 6. _____

a. 1.4037
b. 0.7124
c. 0.5596
d. 0.2430
e. None of these

7. Write the exponential form of: $\log_a 24 = 5$ 7. _____

8. Write the logarithmic form of: $5^2 = 25$ 8. _____

9. Find the domain of the function: $y = 5\log(3x - 2)$ 9. _____

10. Write as a sum, difference, or multiple of logarithms. 10. _____
Expand fully. $\ln\dfrac{5x}{\sqrt{x^2+1}}$

11. Write as the logarithm of a single quantity: 11. _____
$\frac{1}{3}[3\ln x + 2\ln y - \ln z]$

12. Evaluate $\log_a 24$ given that $\log_a 2 = 0.4307$ and $\log_a 3 = 0.6826$ 12. _____

a. 0.8820
b. 1.9747
c. 1.1133
d. 0.2940
e. None of these

13. Solve for x: $4^{2x} = 17$ 13. _____

14. Solve for x: $\ln 4x^2 = 21$ 14. _____

15. Solve for x: $\log x + \log (x + 3) = 1$ 15. _____

16. Use a graphing utility to graph $f(x) = 10e^{2x+1} - 5$ and approximate its zero accurate to three decimal places. 16. _____

17. The demand function for a certain product with price P is given by $P = 450 - 0.4e^{0.007x}$. Find the demand x if the price charged is \$300. 17. _____

18. A certain population decreases according to the equation $y = 300 - 5e^{0.2t}$. Find the initial population. 18. _____

19. Find the population in the problem above when $t = 10$. 19. _____

20. Carbon-14 has a half life of 5715 years. You have an initial quantity of 10 grams. How many grams will remain after 10,000 years? (2 points)

20. _____

21. You have $5000 to invest for 5 years. Account A pays 3% compounded monthly. How much money would you have at the end of the 5 years? (2 points)

21. _____

22. You have $5000 to invest for 5 years. Account B pays 2 ¾ % compounded continuously. How much money would you have at the end of the 5 years? (2 points)

22. _____