Name _____

Write the logarithmic equation in exponential form.

1. $\log_4 63 = 3$
2. $\log_3 81 = 4$
3. $\log_7 \frac{1}{49} = -2$
4. $\log_{16} 8 = \frac{3}{4}$

Write the exponential equation in logarithmic form.

5. $5^3 = 125$
6. $8^2 = 64$
7. $81^{\frac{1}{4}} = 3$
8. $6^{-2} = \frac{1}{36}$

Evaluate the function with out using a calculator.

9. $\log_2 16$
10. $\log_{16} 4$
11. $\log_7 1$
12. $\log_3 3^4$

Graph the following functions. Find the domain, x-intercepts, and vertical asymptotes.

13. $f(x) = \log_4 x$
14. $f(x) = \log_4 (x - 3)$
15. $f(x) = \log_5 (x - 1) + 4$
16. $f(x) = \log_3 x + 2$

Write the logarithmic equation in exponential form.

17. $\ln \frac{1}{2} = -0.693...$
18. $\ln 4 = 1.386$
19. $\ln 250 = 5.521$
20. $\ln 1 = 0$

Write the exponential equation in logarithmic form.

21. $e^3 = 20.0855$
22. $e^{1/2} = 1.6487$
23. $e^{-.5} = 0.6065$
24. $e^x = 4$

Graph the following functions. Find the domain, x-intercept and vertical asymptote.

25. $f(x) = \ln(x-1)$
26. $f(x) = \ln(-x)$
27. $f(x) = \ln x + 3$
28. $f(x) = \ln (x + 2) - 3$