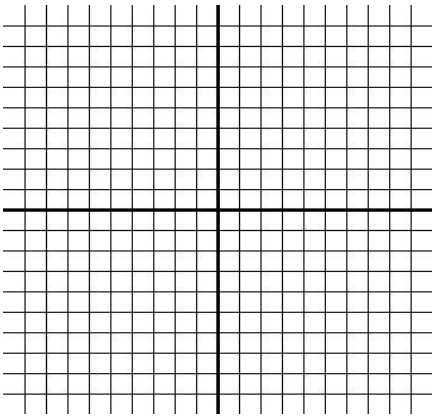
Junior PreCalculus
Logarithms Review

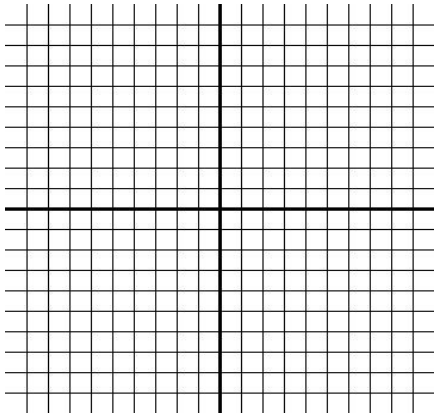
Name: _____
Date: _____ Period: _____

Graph each function. Then state the domain, range, interval of increasing/decreasing, and intercepts.

1. $f(x) = \log_2(x-1)+3$



2. $f(x) = -\ln(x+2)+4$



Evaluate without a calculator using the table above.

3. $\log \frac{1}{100}$
4. $\log_{125} 5$
5. $\log_4 \frac{1}{16}$
6. $\ln e^7$
7. $\log_3 \sqrt[3]{9}$
8. $\log_{\frac{1}{3}} 9$
9. $\log_{16} 8$
10. $e^{\ln 6}$

Use the properties of logarithms to expand each expression.

11. $\log_2 \frac{8xy}{z}$
12. $\log_3 \frac{a^4b^4}{c^2}$
13. $\log \sqrt{3xy}$
14. $\log_5 \frac{\sqrt{x}}{25}$
15. $\log_4 \frac{2ab}{c}$
16. $\log_2 \frac{x^2y}{z}$
17. $\ln \frac{3y}{\sqrt[4]{x}}$

Use the properties of logarithms to condense each expression.

18. $(2\log_6 9 + 3\log_6 x) - 5\log_6 y$
19. $2\log_5 8 + 3\log_5 x$
20. $3\log_7 x - (2\log_7 y + 4\log_7 z)$
21. $\frac{1}{2}\log_2 x - 3\log_2 y$
22. $\ln 56 + 3\ln\frac{1}{2} + \ln y$

Solve each equation. Leave answers in exact form.

23. $\log_8(3x+4)=2$

24. $\ln 48=\ln(11x+26)$

25. $\log 3+\log(4x+3)=\log 33$

26. $\log 2x-\log(x-8)=1$

27. $\log(11x-21)=\log(17-8x)$

28. $\log(3x+4)=2$

29. $\log_3 x+\log_3(2x-1)=1$

30. $6\log_8(20x-36)=12$

31. $\log_4(2x-3)=\log_4 x+\log_4(x-2)$

32. $\log_9(12x-15)=2$

33. $\log_{11} 4+\log_{11}(x-4)=\log_{11} 4$

34. $\log(16x+4)=2$

35. $\ln(x-5)-\ln(x-6)=2$

36. $\log_3(10-x)-\log_3(x+2)=1$