Algebra II Unit 5B Review   Name: _____

Evaluate the expression.		
1. $\log_2(4 \cdot 6)$	2. $\log_2 4^3$	3. $\log 8$
4. $\ln 4.6$	5. $\log\frac{1}{3}$	6. $\log_{16} 81$

Expand the expression.	
7. $\ln 22x$	8. $\log_6 x^6$
9. $\log_3 25$	10. $\ln 3xy^3$
11. $\log_8 64x^2$	12. $\ln x^{\frac{1}{2}}y^3$
13. $\ln\frac{3y^4}{x^3}$	14. $\log_6 \frac{10}{3}$

Condense the expression.	
15. $\ln 16 - \ln 4$	16. $4\log_{16} 12 - 4\log_{16} 2$
17. $7\log_4 2 + 5\log_4 x + 3\log_4 y$	18. $\log_3 2 + \frac{1}{2}\log_3 y$
19. $\log_5 8 - \log_5 12$	20. $\ln 20 + 2\ln\frac{1}{2} + \ln x$

21. $10 \log x + 2 \log 10$	22. $2 \log x + \log 5$

Rewrite the equation in exponential form.

23. $\log_5 \frac{1}{5} = -1$	24. $\log_8 512 = 3$
25. $\log_{14} 196 = 2$	26. $\log_{105} 11{,}025 = 2$

Solve the exponential equation.

27. $25^{x-1} = 125^{4x}$	28. $36^{x-9} = 6^{2x}$
29. $e^{-x} = 6$	30. $10^{2x} + 3 = 8$
31. $0.25^x - 0.5 = 2$	32. $10^{-12x} + 6 = 100$
33. $3^{0.1x} - 4 = 5$	34. $-16 + 0.2(10)^x = 35$

Solve the logarithmic equation.

35. $\ln(4x + 1) = \ln(2x + 5)$	36. $\log_2 x = -1$

37. $16 \ln x = 30$	38. $1 - 2 \ln x = -4$
39. $\log_5 (2x + 15) = \log_5 3x$	40. $\ln x + \ln(x + 3) = 1$
41. $15 + 2 \log_2 x = 31$	42. $\log(5 - 3x) = \log(4x - 9)$

43. You invest $500 into an account earning 6% interest compounded monthly. How long will it be until the balance is double? $A = P\left(1 + \frac{r}{n}\right)^{nt}$

44. You buy a new computer for $2100. The computer decreases by 50% annually. When will the computer have a value of $600? $y = a(1 - r)^t$

45. You drink a beverage with 120 mg of caffeine. Each hour, the caffeine in your system decreases by about 12%. How long until you have 10mg of caffeine? $y = a(1 - r)^t$

46. The foundation of your house has about 1,200 termites. The termites grow at a rate of about 2.4% per day. How long until the number of termites doubles? $y = a(1 + r)^t$