Name: _____ Date: _____Block: _____

Log Manipulation

1. Simplify the following

   (a) $\log x^2 - \log xy + 4 \log y$

   (b) $\ln(8x)^{\frac{1}{2}} + \ln 4x^2 - \ln(16x)^{\frac{1}{2}}$

   (c) $e^6 e^{-6}$

   (d) $12e^7 \div 6e^2$

   (e) $\ln e^2$

   (f) $\ln(e^2 \ln e^3)$

2. Find x in each of the following:

   (a) $\ln x = 2.7$

   (b) $\ln(x + 1) = 1.86$

   (c) $x = e^{9.8} \div e^{7.6}$

   (d) $6.27 = e^x$

   (e) $4.12 = e^{-2x}$

Part II

1. Use the logarithm laws to simplify the following:

   (a) $\log_2 xy - \log_2 x^2$

   (b) $\log_2 \frac{8x^2}{y} + \log_2 2xy$

   (c) $\log_3 9xy^2 - \log_3 27xy$

   (d) $\log_4 (xy)^3 - \log_4 xy$

   (e) $\log_3 9x^4 - \log_3 (3x)^2$

2. Find x if:

   (a) $2 \log_b 4 + \log_b 5 - \log_b 10 = \log_b x$

   (b) $\log_b 30 - \log_b 5^2 = \log_b x$

   (c) $\log_b 8 + \log_b x^2 = \log_b x$

   (d) $\log_b (x + 2) - \log_b 4 = \log_b 3x$

   (e) $\log_b (x - 1) + \log_b 3 = \log_b x$