**Unit 9.3 Functions of Logarithms**

1. Write the logarithmic expression in a different form (if not possible, write N/A)

    a. $\log\left(\dfrac{x}{y^3}\right)$

    b. $\log(a) + \log(b)$

    c. $-\ln\left(\dfrac{1}{x}\right)$

    d. $\ln(a + b)$

2. Find the value of each expression
    a. $\log_2(32)$

    b. $\log_5\left(\dfrac{1}{125}\right)$

    c. $\log_2\sqrt{8}$

    d. $3^{\log_5(5)}$

3. Use the properties of logs to fully expand each expression

    a. $\log_b (5x^4)$

    b. $\log_b (x^2 y)^4$

    c. $\log_5 (xy)^{-2}$

    d. $\log_5 (21x^2 y^{2/3})$

    e. $\log \dfrac{\sqrt{x^5}}{(x+4)^3}$

4. Use the properties of logs to write each expression as a single log

    a. $2\log_b (3) + \log_b (x) - 2\log_b (5)$

    b. $\log_b (x) - 2\log_b (y) - 2\log_b (z)$

c. $3 \log_5 (y) - \frac{1}{2} \log_5 (x)$

d. $-\frac{2}{3} \log_2 (x) - \frac{1}{3} \log_2 (y) + \frac{2}{3} \log_2 (z)$

5. Solve for x (round to the nearest hundredth)

a. $\log (225) \div \log (15) = \log (x)$

b. $\log (x) + \log (x-1) = \log (4x)$

c. $\log_2 (x-2) + \log_2 (x+1) = 2$

d. $e^{2x} - 2e^{2x} = -15$

e. $\ln(x) = \ln(5) - \ln(2)$

f. $3^{2x+1} = 2^{x-2}$

g. $\ln((3)(x+1)) = 4$