In-Class Problems 16 for Wednesday, March 28

These problems are from Pre-Class Problems 16.

1. Use the properties of logarithms to write the following as a sum and/or difference of logarithms. All variables represent positive numbers.

   a. $\ln \dfrac{x^4}{\sqrt[3]{y^2}}$

   b. $\log\left[(4y^3 + 5y^2 - 8)^7\sqrt{4y^2 - 9}\right]$

   c. $\log_5 \dfrac{6 - w^2}{3w + 2}$

   d. $\log_{2/3} \dfrac{x^2\sqrt[5]{2x - 7}}{(x - 8)^3(5x^4 + 11)}$

2. Write the following as a single logarithm.

   a. $\ln x + 5\ln(x^2 - 16) - \dfrac{3}{2}\ln(9x + 8)$

   b. $2\log_{1/2} y - \log_{1/2}(3y - 5) - \dfrac{1}{4}\log_{1/2}(y^3 - 27) + \log_{1/2}(y + 4)$

3. Use the change of base formula and a calculator to approximate the following to four decimal places (the nearest ten-thousandth).

   a. $\log_3 85$

   b. $\log_5 \dfrac{3}{7}$

   c. $\log_{1/2} 9$

4. Solve the following logarithmic equations.

   a. $\log(3x + 7) = 1$

   b. $\log_6 x = 2 - \log_6(x - 9)$

   c. $\ln(40 - t) = \ln(5t + 12)$