Math 1060Q Name: _____

Rules of Logarithms

1. Rewrite the following expressions as logarithms of one quantity with coefficient 1.

   (a) $\frac{1}{2}\ln x + \ln 5$

   (b) $\log_2 x + 4\log_2(x+1) - \frac{1}{3}\log_2(x-1)$

   (c) $5\ln x + 2\ln 3 - 3\ln\left(\frac{1}{y}\right)$

2. Use the rules of logarithms to expand the following expressions so that there are no logarithms of products, quotients, or powers.

   (a) $\ln \sqrt[3]{x^3 y}$

   (b) $\log_{10} \dfrac{10}{4x^2}$

   (c) $\ln \left(\dfrac{x\sqrt{y}}{(1+x)^3} \right)$

3. Suppose $\ln(x) = 2$, $\ln(y) = 3$, and $\ln(z) = 6$. Evaluate the following expressions.

(a) $\ln(xyz)$

(b) $\ln(x^2y)$

(c) $\ln\left(\dfrac{x^3}{\sqrt{z}}\right)$