

1. Evaluate the following logarithms.

$$a) \log_2 16 =$$

$$b) \log_7 1 =$$

$$c) \ln \sqrt[3]{e} =$$

$$d) \log_{\frac{2}{3}} \frac{27}{8} =$$

$$e) \log_{10} 10 =$$

$$f) \ln 1 =$$

2. Use properties of logs and write the following logs in expanded form.

$$a) \log_2 \left( \frac{2ab}{c^3} \right) =$$

$$b) \ln [(x-4)(2x+5)]^2 =$$

$$c) \ln [(x-4)(2x+5)^2] =$$

$$d) \log_8 \sqrt{xy} =$$

3. Express each of the following as a single log.

$$a) 3 \log_5 x + \log_5 y - 2 \log_5 w =$$

$$b) \frac{1}{2} [(2 \ln a + \ln b) - 5 \ln c] =$$

$$c) \frac{1}{2} \ln x - \frac{1}{3} \ln y =$$

4. Solve the following equations:

$$a) \log_2(x+1) + \log_2^3 = 1$$

$$h) \log_2(x^2 - 6x) = 3 + \log_2(1-x)$$

$$b) \log_2(x+3) + \log_2^x = 2$$

$$i) 5 + e^{x+1} = 20$$

$$c) \ln(x-4) + \ln x = \ln 21$$

$$j) 2^x = 7$$

$$d) 4 \ln(3x) = 4$$

$$k) 4^{x-3} = 9$$

$$e) \ln x = \ln(1-x)$$

$$f) 7 + 2 \ln x = 6$$

$$g) \log x + \log(x-1) = \log(3x+12)$$

5) Simplify each log.

$$a) \ln e^5 =$$

$$b) e^{2 \ln 5} =$$

$$c) 10^{2 + \log 5} =$$

$$d) \frac{\log 100}{\log 10} =$$

$$e) \frac{\log_3 9}{\log_2 8} =$$