

1). Use the definition of the logarithmic functions to solve for x .

- a). $\log x = 5$
- b). $\log x = -3$
- c). $3 \ln x = 15$

2). Use the rules of logarithms to rewrite the expression in a form with no logarithm of a product, quotient, root or exponent.

- a). $\log(2x) =$
- b). $\log\left(\frac{x}{2}\right) =$
- c). $\ln(\sqrt{y}) =$
- d). $\ln(\sqrt{ab}) =$
- e). $\log\left(\frac{x^3y^4}{z^6}\right) =$

3). Rewrite the expression as a single logarithmic expression:

- a). $\log 12 + \frac{1}{2} \log 7 - \log 2 =$
- b). $\log(x^2 - 1) - \log(x - 1) =$
- c). $\ln(a + b) + \ln(a - b) - 2 \ln c =$

4). Do the following equalities hold true? Show your work.

- a). $\log(x - y) = \log x - \log y$
- b). $\log\left(\frac{a}{b^2}\right) = \log a - 2 \log b$
- c). $(\log 5)(\log 2) = \log 10$
- d). $-\ln\left(\frac{1}{x}\right) = \ln x$
- e). $5 \log x - 3 \log 2x + \log y = \log\left(\frac{x^2}{8y}\right)$

5). A teacher invests \$5000 in an account that pays 8.5% interest per year compounded quarterly.

- a). Find the amount after 3 years?
- b). How long will it take for the investment to double?
- c). What is the amount after 2 years?

6). Find the time required for an investment of \$1000 to double in value if the interest rate is 8.5% per year compounded continuously.