

Exponential and Logarithmic Functions - Worksheet #1

1. Nobelium, an element discovered in 1958, has a half-life of 10 minutes under certain conditions. In a sample containing 1 g of nobelium, the amount left after t minutes is given by $A(t) = (0.5)^{t/10}$. (Round to three decimal places.)

(a) How much nobelium is left after 5 minutes?

(b) How much nobelium is left after 1 hour?

2. Write the equation in exponential form.

(a) $\log_{125}25 = \frac{2}{3}$

(b) $\log_b15 = x$

3. Write the equation in logarithmic form.

(a) $10^3 = 1000$

(b) $8^{-2} = \frac{1}{64}$

4. Evaluate the logarithms without using a calculator.

(a) \log_381

(b) $\log_{1/2}2$

(c) $\log_x\sqrt{x}$

(d) $\log 0.1$

5. Expand into sums and/or differences of logarithms. Assume all variables represent positive real numbers.

(a) $\log_2\left(\frac{x}{yz}\right)$

(b) $\log\left(\frac{a\sqrt{b}}{cd^2}\right)$

6. Write the expressions as a single logarithm. Assume all variable represent positive real numbers.

(a) $\log_5 8 + \log_5 50 - \log_5 16$

(b) $\log_5 a - \frac{1}{2}\log_5 b - 3\log_5 c$