

Logarithmic Functions Worksheet

Name _____

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1. Solve for x in each of the following equations. Find an exact solution.

(a) $3 \cdot 2^x + 8 = 25$

(b) $5 \cdot 2^x = 4 \cdot e^{3x}$

(c) $ab^x = c$

(d) $ax^b = c$

2. Let $p = \log m$ and $q = \log n$. Write each of the following in terms of p and q so that logarithms don't appear in your final answer.

(a) m^4

(b) $\log\left(\frac{1}{n}\right)$

(c) $\frac{\log m}{\log n}$

(d) $\log(n^3)$

3. A cup of coffee contains 100 mg of caffeine, which leaves the body at a continuous rate of 17% per hour.

(a) Write a formula for the amount, A mg, of caffeine in the body t hours after drinking a cup of coffee.

(b) Graph the function from part (a). Use the graph to estimate the half-life of caffeine.

(c) Use logarithms to find the half-life of caffeine.