

Algebra 2: Exponential & Logarithmic Functions



Name: _____ Date: _____

Part A: Logarithmic & Exponential Equations. Solve each problem by applying fundamental algebraic logarithmic properties.

1. Evaluate the exact numerical value of the logarithm: $\log_2(64)$

- A. 32
- B. 6
- C. 8
- D. 16

2. Solve for x in the exponential equation: $3^{(2x - 1)} = 27$

- A. $x = 1$
- B. $x = 2$
- C. $x = 3$
- D. $x = 1.5$

3. A biological bacterial colony begins with 500 cells and doubles every 3 hours according to $N(t) = 500 \cdot 2^{(t / 3)}$. What is the total population after 12 hours?

- A. 4,000 cells
- B. 8,000 cells
- C. 2,000 cells
- D. 16,000 cells

Part B: Logarithmic Properties Fluency. Complete each logarithmic identity with the correct numerical value or power.

Word bank: 0, 1, 3, 10, 100

- 1. For any positive real base $b \neq 1$, the logarithm of 1 is always $\log_b(1) = \underline{\hspace{2cm}}$ because $b^0 = 1$.
- 2. In common logarithms (base 10), $\log(10) = \underline{\hspace{2cm}}$ and $\log(1000) = 3$.
- 3. Using the power rule of logarithms: $\log_2(8) = \log_2(2^3) = \underline{\hspace{2cm}} \cdot \log_2(2) = 3$.
- 4. If $\log(x) = 2$ in base 10, then the value of x is $10^2 = \underline{\hspace{2cm}}$.