

Unit 5: Exponential Functions and Equations

ADVANCED · SET 2

Name: _____ Date: _____

Solve each problem. Give exact answers where possible, otherwise round to 3 decimal places. Use $\ln$ or $\log$ as needed.

1. A quantity decays continuously with $P(t) = 500 \times e^{-kt}$. If $P(6) = 200$, find the continuous decay rate k . Round to 4 decimal places.

Answer: _____

3. Solve for x : $\log_2(x) + \log_2(x-6) = 4$. Give the exact value of x .

Answer: _____

5. Solve for x : $\log(2x+3) - \log(x-1) = 1$ (log base 10). Give the exact value of x .

Answer: _____

7. Solve for x : $4^x = 3^{x+2}$. Round to 3 decimal places.

Answer: _____

2. Solve for x : $2^x \times 2^{x+3} = 100$. Round to 3 decimal places.

Answer: _____

4. An investment grows continuously at 6.5% per year. How many years to triple? Use $A = P \times e^{(0.065t)}$. Round to 3 decimal places.

Answer: _____

6. A radioactive sample has a half-life of 12 years. Its amount follows $A(t) = A_0 \times e^{-kt}$. Find k . Round to 5 decimal places.

Answer: _____

8. Two continuous-growth cultures start at the same size. Culture A grows at 3% per year, culture B at 5% per year. After how many years is B exactly twice the size of A? Round to 3 decimal places.

Answer: _____