

Unit 4 Test

Growth, Decay, Solving Equations & Fitting Models

Name: _____ Date: _____ Score: ____ / 10

INSTRUCTIONS

For multiple-choice questions, circle the letter of the correct answer. For short-answer and problem-solving questions, show your complete work in the space provided. No calculator unless your teacher says otherwise.

1 Solve for x : $2^x = 32$

Multiple Choice

A 5**B** 4**C** 16**D** 6**2 Solve: $\log_2(x) = 5$**

Multiple Choice

A 32**B** 10**C** 25**D** 7**3 Short Answer — Solve: $3^{x-1} = 27$**

Short Answer

4 Simplify: $\log(100) + \log(10)$

Multiple Choice

A 3**B** 2**C** 110**D** 1000**5 Expand using log properties: $\log(x^2y/z)$**

Multiple Choice

A $2\log(x) + \log(y) - \log(z)$ **B** $2\log(x) \cdot \log(y) / \log(z)$ **C** $\log(x^2) + \log(y) + \log(z)$ **D** $2\log(xy) - \log(z)$ **6 Short Answer — Solve: $5^{2x} = 125$**

Short Answer

Unit 4 Test

Growth, Decay, Solving Equations & Fitting Models

7

A population grows according to $P(t) = 200e^{0.03t}$. What is the population after 10 years, to the nearest whole number?

Multiple Choice

☐ A 270☐ B 260☐ C 230☐ D 300

8

Solve the logarithmic equation: $\ln(x) = 2$ (round to the nearest hundredth).

Multiple Choice

☐ A 7.39☐ B 2.72☐ C e☐ D 0.69

9

Problem Solving — A radioactive substance decays according to $A(t) = 500e^{-0.05t}$. Find the half-life of the substance, rounded to the nearest year.

Problem Solving

10

Problem Solving — Solve $2^{x+1} = 3^x$ for x using logarithms. Express your answer exactly (in terms of logarithms) and as a decimal rounded to the nearest hundredth.

Problem Solving