Unit 5: Exponential Functions and Equations

ADVANCED

Name: _____ Date: _____

Solve each problem. Give exact answers where possible; otherwise round to the indicated place. Show all logarithm work.

1. Solve for x: 5 × 3^(2x) = 405. Give the exact value of x.

Answer: _____

2. A population grows continuously by the model P(t) = 1200·e^(0.045t), where t is in years. To 2 decimal places, how many years until the population reaches 3000?

Answer: _____

3. Solve for x exactly as a fraction: 8^(x) = 32. (Write both sides as powers of 2.)

Answer: _____

4. Solve for x exactly: log_2(x) + log_2(x - 6) = 4. Give the valid solution only.

Answer: _____

5. A sample of a substance decays continuously with model A(t) = A0·e^(-0.0012t), t in years. To the nearest whole year, what is its half-life?

Answer: _____

6. Solve for x, rounded to 4 decimal places: 2^(x) = 3^(x-1).

Answer: _____

7. Solve for x exactly as a fraction: 9^(2x-1) = 27^(x+2). (Use base 3.)

Answer: _____

8. An investment of $5000 earns interest compounded continuously at 6% per year, A = 5000·e^(0.06t). To 2 decimal places, how many years until it reaches $12000?

Answer: _____

9. Solve for x exactly: ln(x + 3) - ln(x - 1) = ln(5). Give the value of x as a fraction.

Answer: _____