

Create Exponential Equations to Solve Real-Life Problems

Name _____ Period: _____ Date: _____

Directions: Use the information given to solve each problem.

1. Emily has 4,500 subscribers to her podcast. The number of subscribers is increasing by 5% per month. Which function represents the number of subscribers after m months?

A. $f(m) = 4,500(0.95)^m$
B. $f(m) = 4,500(1.05)^m$
C. $f(m) = 4,500(1.05)^{m-1}$
D. $f(m) = 4,500(0.95)^{m-1}$

2. A car's value is \$28,000, and it depreciates at a rate of 12% per year. Which function represents the car's value after t years?

A. $f(t) = 28,000(1.12)^t$
B. $f(t) = 28,000(0.88)^t$
C. $f(t) = 28,000(1.12)^{t-1}$
D. $f(t) = 28,000(0.88)^{t-1}$

3. Jessica's bakery initially sold 800 loaves of bread per month. Sales have been increasing by 2% per month due to advertising. Which function represents the number of loaves sold after n months?

A. $f(n) = 800(1.02)^n$
B. $f(n) = 800(0.98)^n$
C. $f(n) = 800(1.02)^{n-1}$
D. $f(n) = 800(0.98)^{n-1}$

4. A company's stock value was \$50,000 but has been decreasing by 8% per quarter due to market conditions. Which function represents the stock value after q quarters?

A. $f(q) = 50,000(1.08)^q$
B. $f(q) = 50,000(0.92)^{q-1}$
C. $f(q) = 50,000(1.08)^{q-1}$
D. $f(q) = 50,000(0.92)^q$

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Answer Key

1. **Problem 1:**

- Initial subscribers = 4,500.
 - Increase = 5%.
 - Growth factor = $1 + 0.05 = 1.05$. B
 - Exponential formula: $f(m) = 4,500(1.05)^m$.
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2. **Problem 2:**

- Initial value = \$28,000.
 - Depreciation = 12%. B
 - Decay factor = $1 - 0.12 = 0.88$.
 - Exponential formula: $f(t) = 28,000(0.88)^t$.
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3. **Problem 3:**

- Initial sales = 800 loaves.
 - Increase = 2%.
 - Growth factor = $1 + 0.02 = 1.02$. A
 - Exponential formula: $f(n) = 800(1.02)^n$.
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4. **Problem 4:**

- Initial stock value = \$50,000.
- Decrease = 8%.
- Decay factor = $1 - 0.08 = 0.92$. D
- Exponential formula: $f(q) = 50,000(0.92)^q$.