

NAME: _____

P.I. A.A.9: Analyze and solve verbal problems that involve exponential growth and decay

P.I. A2.A.6: Solve an application which results in an exponential function

1. Write and solve an exponential function to model the situation and find the value after the given time. Round to the nearest whole number. \$20,000 purchase; 6% loss in value each year; 17 years

[A] $y = 20,000(1.06)^x$
\$50,807

[B] $y = 20,000(0.94)^x$
\$7431

[C] $y = 20,000(0.94)^x$
\$6986

[D] $y = 20,000(1.06)^x$
\$53,855

2. Write and solve an exponential function to model the situation and find the population after the given time. Round to the nearest whole number. 2 million initial population; 4% annual decrease; 3 years

[A] $y = 2,000,000(0.96)^x$
1,769,472

[B] $y = 2,000,000(1.04)^x$
2,163,200

[C] $y = 2,000,000(0.96)^x$
1,843,200

[D] $y = 2,000,000(1.04)^x$
2,249,728

3. Write an exponential function to model the situation. Then predict the value of the function after 5 years (to the nearest whole number).

A population of 390 animals that increases at an annual rate of 10%.

4. Write an exponential function to model the situation. Then predict the value of the function after 5 years (to the nearest whole number).

A population of 410 animals that decreases at an annual rate of 14%.

5. Compare the quantity in Column A with the quantity in Column B.

the value of y when $x = 5$

Column A Column B

$y = a(0.4)^x$ $y = a(1.02)^x$

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The two quantities are equal.

[D] The relationship cannot be determined on the basis of the information supplied.

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6. Compare the quantity in Column A with the quantity in Column B.

$$p > q$$

Column A

Column B

$$y = pb^{kx}$$

$$y = qb^{kx}$$

- [A] The quantity in Column A is greater. [B] The quantity in Column B is greater.
[C] The two quantities are equal.
[D] The relationship cannot be determined on the basis of the information supplied.

7. Compare the quantities in Column A and Column B.

Column A

Column B

the value of $y = 6^x$ at $x = 4$ the value of $y = x^6$ at $x = 4$

- [A] The quantity in Column A is greater. [B] The quantity in Column B is greater.
[C] The quantities are equal.
[D] The relationship cannot be determined from the information given.

[1] C

[2] A

[3] $f(x) = 390(1.1)^x$; 628

[4] $f(x) = 410(0.86)^x$; 193

[5] D

[6] A

[7] B