

Assignment

Write

Describe the differences between a linear function and an exponential function using your own words.

Remember

All sequences are functions, and some geometric sequences are exponential functions.

The form of an exponential function is $f(x) = a \cdot b^x$, where a and b are real numbers and $b > 0$, but $b \neq 1$. The a -value represents the y -intercept and the b -value represents the constant ratio, or constant multiplier.

Practice

1. Each table shows the population of a city over a three-year period. Write an exponential function to represent each population as a function of time.

a.

Blueville	
1	7098
2	7197
3	7298

b.

Youngstown	
1	12,144
2	12,290
3	12,437

c.

Greenville	
1	7860
2	7722
3	7587

2. Consider each situation. If possible, identify a constant ratio and write an exponential function to represent the relationship. Be sure to define your variables.

a. Manuel works in a lab. The number of bacteria over time in a petri dish he is studying is shown in the table.

Bacteria	
Time (hours)	Number of Bacteria
0	605
1	2420
2	9680
3	38,720

b. Jessica has been studying the honey bee population. The number of honey bees she documents over time is shown in the table.

Honey Bee Population	
Time (years)	Number of Honey Bees
1	52,910
2	43,069
3	35,058
4	28,537

c. Jackson started depositing money into a savings account. The amount of money over time in the account is shown in the table.

Savings Account	
Time (years)	Value (\$)
5	875
10	1200
15	1525
20	1850

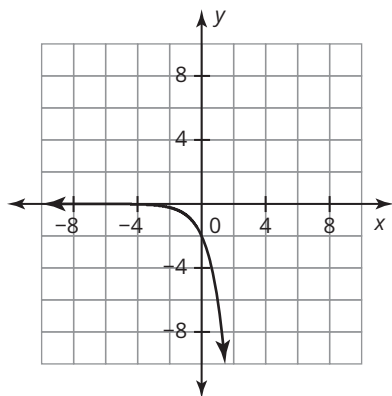
Stretch

Which of the functions does not fit with the others? Explain your answer.

A. The exponential function that goes through $(0, -3)$ and $(5, -96)$.

B. $f(x) = -1 \cdot 6^x$

C.



D.

x	y
1	$\frac{2}{3}$
2	$\frac{2}{9}$
3	$\frac{2}{27}$

Review

1. Solve each equation. Show your work.

a. $|x - 4| = 7$

b. $|3x + 5| = 11$

2. Determine the inverse of each function. Is the inverse also a function?

Explain why or why not.

a. $y = -4$

b. $y = \left(\frac{1}{4}\right)x + \frac{3}{2}$

3. Solve each system of linear equations.

a.
$$\begin{cases} y = -5x - 21 \\ -2x + 5y = -24 \end{cases}$$

b.
$$\begin{cases} 8x - 3y = 4 \\ 7x - 10y = -26 \end{cases}$$