

Answers

GGG Investigations 1-2 ... More Practice

For each table of data below, decide if it represents a linear or exponential relationship, and write the equation.

1.

x	3	5	6	8
y	-42	-26	-18	-2

$\begin{matrix} +2 \\ \wedge \\ +1 \\ \wedge \\ +2 \\ \wedge \end{matrix}$

$\begin{matrix} \vee \\ +16 \\ \vee \\ +9 \\ \vee \\ +16 \end{matrix}$

$\frac{\Delta y}{\Delta x} = \frac{16}{2} = \frac{8}{1} = 8$

$y = mx + b$
 $y = 8x + b$
 $-2 = 8(8) + b$

$-2 = 64 + b$
 $\frac{-64 \quad -64}{-66 = b}$

$y = 8x - 66$

2.

x	0	1	2	3	4
y	0.25	0.5	1	2	4

$\begin{matrix} +1 \\ \wedge \\ +1 \\ \wedge \\ +1 \\ \wedge \end{matrix}$

$\begin{matrix} \vee \\ \times 2 \\ \vee \\ \times 2 \\ \vee \\ \times 2 \end{matrix}$

$y = 0.25(2)^x$

3.

x	4	6	8	10
y	30	26	22	18

$\begin{matrix} +2 \\ \wedge \\ +2 \\ \wedge \\ +2 \\ \wedge \end{matrix}$

$\begin{matrix} \vee \\ -4 \\ \vee \\ -4 \\ \vee \\ -4 \end{matrix}$

$\frac{\Delta y}{\Delta x} = \frac{-4}{2} = -2$

$y = -2x + b$
 $30 = -2(4) + b$
 $30 = -8 + b$
 $\frac{+8 \quad +8}{38 = b}$

$y = -2x + 38$

4.

x	1	2	3	4
y	2	6	18	54

$\begin{matrix} +1 \\ \wedge \\ +1 \\ \wedge \\ +1 \\ \wedge \end{matrix}$

$\begin{matrix} \vee \\ \times 3 \\ \vee \\ \times 3 \\ \vee \\ \times 3 \end{matrix}$

$y = a(3)^x$
 $\frac{2}{3} = \frac{a(3^1)}{3}$
 $\frac{2}{3} = a$

$y = \frac{2}{3}(3)^x$

5.

x	4	5	6	7
y	25	100	400	1600

$$y = a(4)^x$$

$$\frac{25}{4^4} = \frac{a(4)^4}{4^4}$$

$$\frac{25}{256} = a$$

$$y = \frac{25}{256} (4)^x$$

6. Bacteria in a dirty glass double every hour. If there are 25 bacteria to start, how many are in the glass after 8 hours?

$$y = 25(2)^x$$

when $x=8$

$$y = 25(2)^8$$

$$y = 6400$$

There will be 6400 bacteria

7. Toby ate half a banana in his room and forgot to throw the rest away. That night, two gnats came to visit the banana. Each night after, there were four times as many gnats hanging around the banana.

a. Write an equation that models the gnats' growth over time. Use x for the nights and y for the number of gnats.

$$y = 2(4)^x$$

b. Tobys mom said that he will be grounded if the gnats number more than 120. On what night will Toby be in trouble if he doesn't step in and solve the gnat problem?

$$2(4)^2 = 32$$

$$2(4)^3 = 128$$

Toby will be in trouble on the third night.

8. The most recent virus that is making people ill is a fast multiplying one. On the first day of the illness, only 6 virus "bugs" are present. Each day after, the amount of "bugs" triples.

a. Write a function that models the "bugs" growth over time. Use x for days and y for the amount of "bugs."

$$y = 6(3)^x$$

b. How many "bugs" will be present by the 5th day?

$$y = 6(3)^5$$

$$y = 486$$

There will be 486 "bugs" on the 5th day.