

KEY

Math Plus Honors

Linear vs. Exponential Homework (4 questions)

1. Decide whether the word problem represents a linear or exponential function. Circle either linear or exponential. Then, write the function formula.

a. "A library has 8000 books, and is adding 500 more books each year."

Linear or exponential? $y = 500x + 8000$

b. "A gym's customers must pay \$50 for a membership, plus \$3 for each time they use the gym."

Linear or exponential? $y = 3x + 50$

c. "A bank account starts with \$10. Every month, the amount of money in the account is tripled."

Linear or exponential? $y = 10(3)^x$

2. Decide whether the table represents a linear or exponential function. Circle either linear or exponential. Then, write the function formula.

a.

x	0	1	2	3	4	5	6	7
y	2	5	8	11	14	17	20	23

Linear or exponential? $y = 3x + 2$

b.

x	0	1	2	3	4	5	6	7
y	3	6	12	24	48	96	192	384

Linear or exponential? $y = 3(2)^x$

c.

x	0	1	2	3	4	5	6	7
y	10	5	2.5	1.25	.625	.3125	.15625	.078125

Linear or exponential? $y = 10\left(\frac{1}{2}\right)^x$

4.

A science experiment involves periodically measuring the number of mold cells present on a piece of bread. At the start of the experiment, there are 50 mold cells. Each time a periodic observation is made, the number of mold cells triples. For example, at observation #1, there are 150 mold cells.

a. Write a function formula equation ($y = \dots$) for the number of mold cells present, where x stands for the observation number.

$$a=50$$

$$b=3$$

$$y = 50(3)^x$$

b. Fill in the missing outputs of this table.

$x =$ observation number	0	1	2	3	4	5
$y =$ mold cell count	50	150	450	1350	4050	12150

c. Suppose that the mold begins to be visible as green coloration when the mold cell count exceeds 100,000. On which observation will this happen?

$y = 50(3)^x$
in the 7th observation!

$$100,000 = 50(3)^x$$

Graph both in y_1 + y_2 , find intersect
 $x = 6.91$

d. What will be the mold cell count on the 20th observation? When you find the answer on your calculator, it will be so large that it displays in scientific notation (E notation). Rewrite the answer as an ordinary big number.

$$y = 50(3)^{20}$$

$$y = 1.7E11$$

$$1.7000000000000$$

170,000,000,000 mad cells