

Determine if each situation is modeled by a LINEAR function, EXPONENTIAL function, or NEITHER.

1. $f(x) = -9x + 2$

Circle one:

LINEAR

EXPONENTIAL

NEITHER

2. $f(n) = f(n - 1) - 2; f(1) = 2$

Circle one:

LINEAR

EXPONENTIAL

NEITHER

3. Fernando wants to know how tall his plant will be in one month. When he first got his plant, it was 2 inches tall. He has noticed that it grows a half an inch each day.

Circle one:

LINEAR

EXPONENTIAL

NEITHER

4. $f(x) = 39(2)^x$

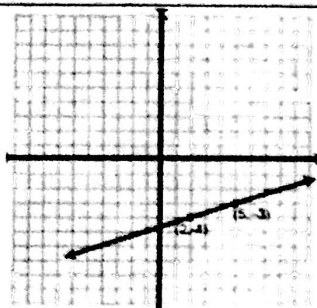
Circle one:

LINEAR

EXPONENTIAL

NEITHER

5.



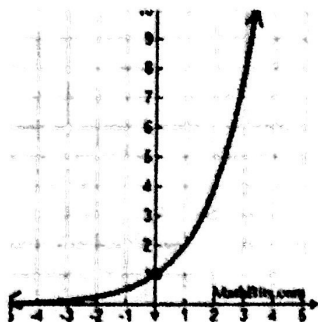
Circle one:

LINEAR

EXPONENTIAL

NEITHER

6.



Circle one:

LINEAR

EXPONENTIAL

NEITHER

7.

x	$f(x)$
1	1
2	4
3	9
5	25

Circle one:

LINEAR

EXPONENTIAL

NEITHER

8. $f(x) = 18x^4$

Circle one:

LINEAR

EXPONENTIAL

NEITHER

Free Response - Show all work.

10. Simplify: $\frac{12q^8r^7}{18qr^{12}} \cdot \frac{20^7r^{-5}}{3}$

$$\frac{2q^7}{3r^5}$$

11. Simplify: $(3xy^8)^3(4x^3y^5)$

$$(27x^3y^{24})(4x^3y^5)$$

$$108x^6y^{29}$$

12. Simplify: $2x^8 + 5$

$$2x^8 + 5$$

13. Write the equation of a line in slope-intercept form that has a slope of -3 and a y-intercept of 18

$$y = -3x + 18$$

14. Write the equation of a line that has a slope of $\frac{3}{4}$ and goes through the point $(-4, -12)$.

$$y = \frac{3}{4}(x+4) - 12$$

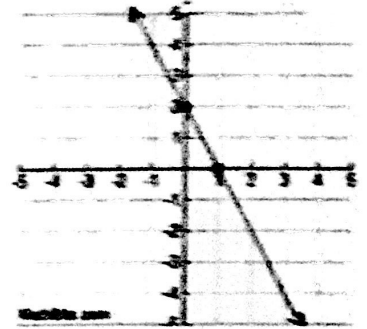
or $y = \frac{3}{4}x + 3 - 12$

$$y = \frac{3}{4}x - 9$$

15. Write the equation of the line graphed to the right.

Slope = $-2/1 = -2$ y-int (0, 2)

$$y = -2x + 2$$



16. Identify the slope and y-intercept of the line $y = -x + 2$

Slope = -1 y-int (0, 2)

17. Write the equation of the line that has a slope of zero and passes through the point (5, 3).

$$y = 0(x-5) + 3$$

$$y = 0x - 0 + 3$$

$$y = 3$$

18. To save money for a car for your 16th birthday, your parents deposited \$5,000 into a bank account that earns 3% interest. The money is left there for 4 years. How much money will be in the account to purchase the car?

$$y = 5000(1 + 0.03)^4 = \$5627.54$$

19. You took a 100 mg dosage of a medication that will filter out of your body according to the equation:

$y = 100(0.74)^x$, where x represents the number of hours after you have taken the drug, and y represents the amount of the drug that will be left in your body. How much of the drug is left in your body after 2 hours?

$$y = 100(0.74)^2 = 54.76 \text{ mg}$$

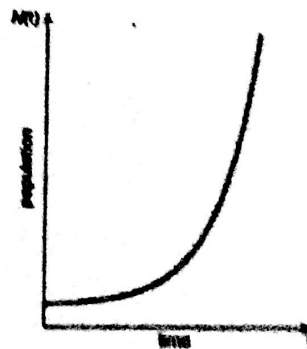
20. Write the equation matches the table:

x	0	1	2	3	4	5
y	5	35	245	1,715	12,005	84,035

$\times 7$

$$y = 5(7)^x$$

21. Write a scenario that could match the graph below:



A population of rabbits starts with 5 rabbits. The population triples each year.

22. Create a table that shows the value of the boat for the first 4 years if the original value is \$40,000 and it is depreciating at a rate of 10% each year.

$$y = 40000(1 + .10)^x$$

Year	0	1	2	3	4
Value	40000	36000	32400	29160	26244

23. For a few months, Dexter recorded the amount of fluid ounces of laundry detergent remaining (y) after his family washed (x) loads of laundry. The equation is: $y = -2.3x + 38$. Describe the slope and y -intercept using context.

Slope \Rightarrow The amount of detergent decreases by 2.3 ounces every load of laundry done.

y -int \Rightarrow The bottle initially had 38 ounces of detergent in it.

24. A bouncy ball starts at a height of 60 inches off the ground. Each time it bounces, it comes back up to $\frac{3}{4}$ of the height.

- a. Write an explicit equation in inches that shows the value for x (the number of bounces).

$$y = 60\left(\frac{3}{4}\right)^x$$

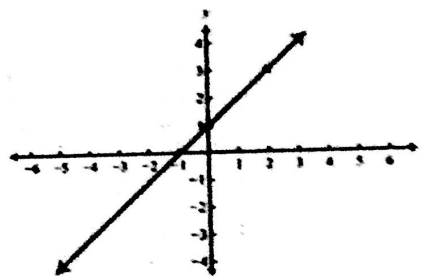
- b. About how long will it take for the ball to be less than an inch off the ground?

after about 14 bounces. (on the 15th bounce)

25. Write the equation of the line on the graph in slope-intercept form:

Slope = 1 y -int (0, 1)

$$y = x + 1$$



26. Write the equation of the line in slope-intercept form going through the points $(-4, 8)$ and $(-2, 12)$.

$$m = \frac{12 - 8}{-2 - (-4)} = \frac{4}{2} = 2$$

$$y = 2(x + 4) + 8$$

$$y = 2x + 8 + 8$$

$$y = 2x + 16$$

$$y = 2(x + 2) + 12$$

$$y = 2x + 4 + 12$$

$$y = 2x + 16$$

27. Mitchell bought a new car at a cost of \$30,000. The value of the car decreases exponentially at the same rate each year. One year later, the value of the car was \$26,400.

- A. What is the common ratio? .88

- B. Write an explicit equation to model this situation.

$$y = 30000(.88)^x$$

- C. By what percent is this car depreciating? 12%

# Years	Value of Car
0	\$30,000
1	\$26,400
2	\$23,232
3	\$20,444.16