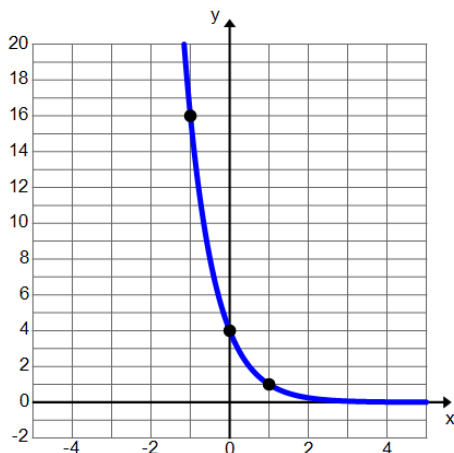


- A certain type of tree doubles its weight every year for the first ten years. If it weighs 5 pounds when it is planted, which expression would calculate how much it will weigh at the end of the first 10 years?  
A.  $5 \cdot 10^2$       B.  $2 \cdot 10^5$   
C.  $10 \cdot 5^2$       D.  $5 \cdot 2^{10}$
- Your hair is 7 inches long right now. It grows about 2 inches per month. Which equation would correctly calculate how long it will be in  $m$  months?  
A.  $h = 7^m + 2$       B.  $h = 7m + 2$   
C.  $h = 2m + 7$       D.  $h = 2^m + 7$
- You have a lawn with 14 dandelions on it. You hear that the number of dandelions will increase by 9 every week. Write an equation that would calculate how many dandelions the lawn will have after  $x$  weeks.
- A new university hopes to double its enrollment each year for the next 8 years. It is starting with 1,000 students. How many people will be enrolled in 8 years?  
A. 1,016      B. 8,002  
C. 256,000      D. 64,000
- A flood doubles its square footage every week. Right now it is 19 square miles. Which of the following would calculate how big it will be in  $w$  weeks?  
A.  $A = 19 + 2^w$       B.  $A = 19 \cdot 2^w$   
C.  $A = 19 + 2w$       D.  $A = 2 + 19w$
- A new company is wanting to triple its profit every year. If it starts with a profit of \$4000, how much will their profit be after 6 years?
- You plant a sunflower when it is 5 inches tall. It grows 3 inches per week. Which expression will calculate how tall it will be in 7 weeks?  
A. 105 inches      B. 10,935 inches  
C. 26 inches      D. 38 inches
- How many rabbits would be in a population, if they start with 7 rabbits and double four times?



14. Write an equation for the following graph:



15. A population of bears is decreasing. The population this year is 150 bears. After 1 year, it is estimated that the population will be 120 bears. After 2 years, it is estimated that the population will be 96 bears. Which equation describes the bear population in any year  $x$ ?

- A.  $y = 150 \cdot 0.8^x$
- B.  $y = 120 \cdot 0.8^x$
- C.  $y = 120 \cdot 1.25^x$
- D.  $y = 150 \cdot 1.25^x$

16. Which equation represents the relationship between  $x$  and  $y$  shown in the table below?

$x$	$y$
0	4
1	64
2	1024
3	16384

- A.  $y = 16 + 4x$
- B.  $y = 4 + 16x$
- C.  $y = 4 \cdot 16^x$
- D.  $y = 16 \cdot 4^x$

17. Write an equation that represents the relationship between  $x$  and  $y$  shown in the table below.

X	Y
0	63
2	91
3	105
4	119

18. The population of a small town was 900. After 1 and 2 years, the population was 1170 and 1521, respectively. Which function describes the relationship between year and town population?

- A.  $y = 900 \cdot (1.3)^x$
- B.  $y = 270x + 900$
- C.  $y = 900 \cdot (0.77)^x$
- D.  $y = 900x + 270$

19. Which equation represents the relationship between  $x$  and  $y$  shown in the table below?

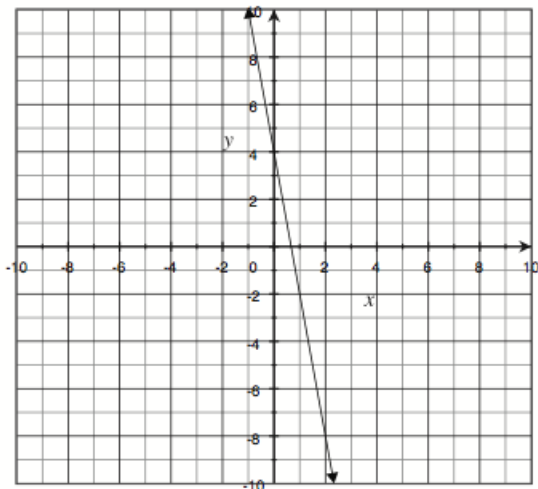
$x$	$y$
0	8
1	96
2	1152
3	13824

- A.  $y = 8 + 12x$
- B.  $y = 8x + 12$
- C.  $y = 8 \cdot 12^x$
- D.  $y = 12 \cdot 8^x$

20. Write an equation that represents the relationship between  $x$  and  $y$  shown in the table below.

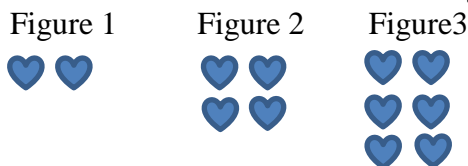
X	Y
1	1
2	6
3	36
4	216

21. Which equation that represents the relationship between  $x$  and  $y$  shown in the graph below?

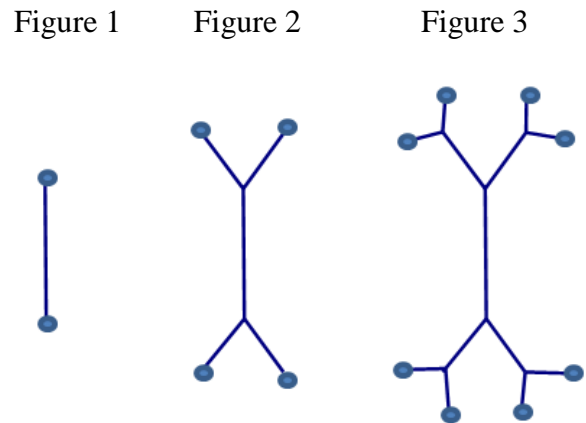


- A.  $y = -4 \cdot 6^x$       B.  $y = -6x + 4$   
 C.  $y = -4x - 6$       D.  $y = (-6) \cdot 4^x$

22. Write an equation that would calculate the total number of hearts in each figure.



23. Which equation describes how many dots there are after  $x$  minutes?



- A.  $y = 2(2)^x$       B.  $y = 2x + 1$   
 C.  $y = 1(2)^x$       D.  $y = 2x + 2$

24. Write an equation that represents exponential decay.

25. Write an equation that represents exponential growth.

26. Which equation represents exponential decay?

- A.  $y = 8.6(7.22)^x$       B.  $y = 1.05(7.95)^x$   
 C.  $y = 0.17(3.26)^x$       D.  $y = 17.8(0.06)^x$

27. Which equation shows exponential growth?

- A.  $y = 0.5(0.9)^x$       B.  $y = 2(1.98)^x$   
 C.  $y = 11.8(0.92)^x$       D.  $y = 1.8(0.21)^x$

28. Write an equation that has faster exponential growth than the following equation:

$$y = 3.5(1.4)^x$$

29. Write an equation that has faster exponential decay than the following equation:

$$y = 8.6(0.5)^x$$

30. Which equation represents the fastest exponential growth?

A.  $y = 7.62(0.22)^x$       B.  $y = 1.22(2.62)^x$

C.  $y = 0.86(3.46)^x$       D.  $y = 0.46(0.86)^x$

31. Which equation represents the fastest exponential decay?

A.  $y = 7.62(0.22)^x$       B.  $y = 1.22(2.62)^x$

C.  $y = 0.86(3.46)^x$       D.  $y = 0.46(0.86)^x$

32. Write an equation that has an initial value of 3.5 and increases at a rate of 2.4%.

33. Write an equation that has an initial value of 25 and declines at a rate of 20%.

34. Which equation correctly shows an initial value of 4 and declining at a rate of 12%?

A.  $y = 4(1 + 0.12)^x$       B.  $y = 12(1 + 0.04)^x$

C.  $y = 4(1 - 0.12)^x$       D.  $y = 4(1 - 12)^x$

35. Given the equation  $y = 17(1.08)^x$  which of the following is true:

A. The initial value is 17 and it is increasing at a rate of 8%.

B. The initial value is 1.08 and it is increasing at a rate of 17%.

C. The initial value is 17 and it is decreasing at a rate of 8%.

D. The initial value is 1.08 and it is increasing at a rate of 1.08%.

36. Eros Industries bought a laser printer in 2000 for \$1,800. It is expected to decrease in value at a rate of 11% per year. What will the value of the printer be 19 years? Round to the nearest dollar.

A. \$6

B. \$13074

C. \$2

D. \$197

37. The Smiths bought an apartment for \$125,000. Assuming that the value of the apartment will increase in value, at most 2% each year, how much could the apartment be worth in 3 years?

A. \$216,000

B. \$337,500

C. \$132,651

D. \$125,752

38. Addie gets a new job that pays \$7.50 an hour. Each month she receives a 4.5% pay raise. How much will she make after 8 months?

39. The value of a new car purchased for



