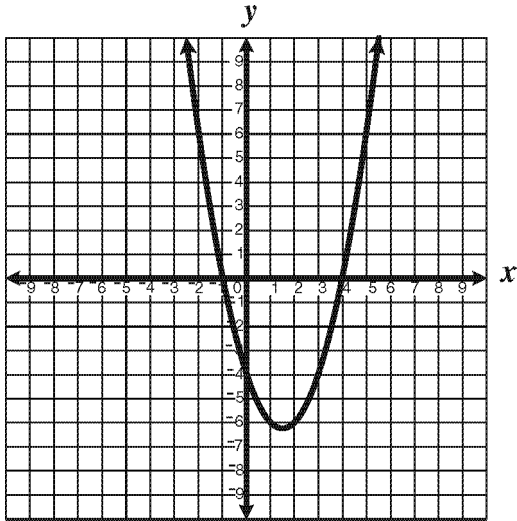


Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. The graph of the equation  $y = x^2 - 3x - 4$  is shown below.

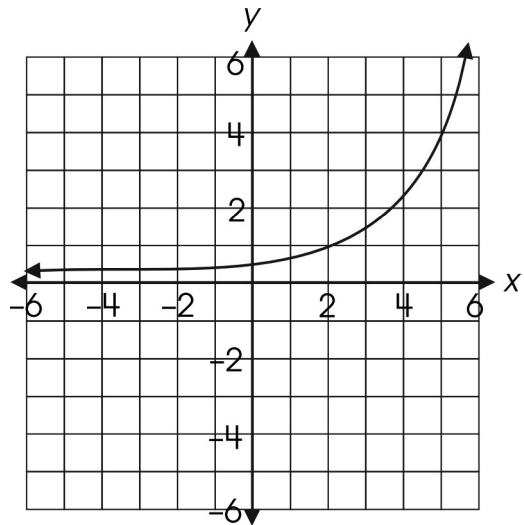


For what value or values of  $x$  is  $y = 0$ ?

- A.  $x = -1$  only                      B.  $x = -4$  only  
 C.  $x = -1$  and  $x = 4$               D.  $x = 1$  and  $x = -4$
2. What is the minimum value of the function  $f(x) = 2x^2 - 12x + 4$ ?

- A. -20                      B. -14                      C. 4

3. A relationship is shown.



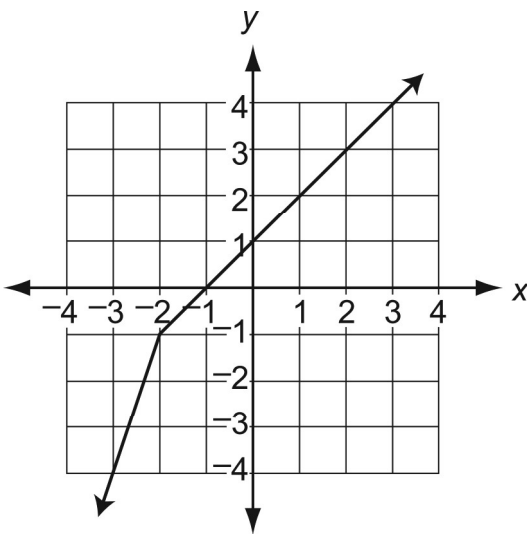
As the value of  $y$  decreases, what happens to the value of  $x$ ?

- A. The value of  $x$  decreases.  
 B. The value of  $x$  increases.  
 C. The value of  $x$  stays the same.  
 D. The value of  $x$  increases and decreases.
4. Which is the  $y$ -intercept for the function  $f(x) = 3x - 6$ ?

- A.  $(0, -6)$                       B.  $(-6, 0)$   
 C.  $(0, 2)$                         D.  $(2, 0)$

5. Paul graphs the equation  $y = 2^x$ .  
Where does his graph intersect the  $y$ -axis?
- A. (0, 0)    B. (0, 1)    C. (1, 0)    D. (2, 0)

6. Use the graph of the function below to answer the question.



Which description of the function is true?

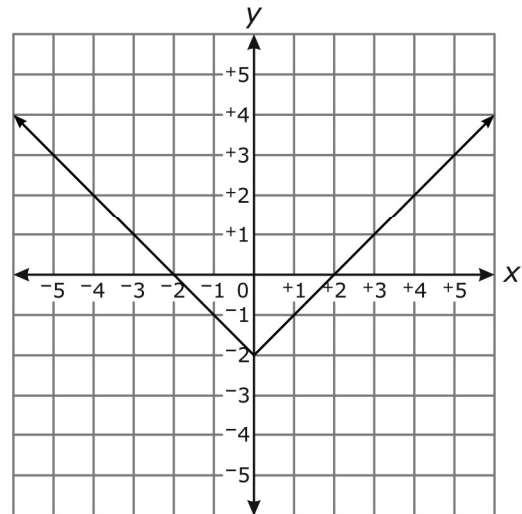
- A. The function is linear and always increasing.
- B. The function is nonlinear and always increasing.
- C. The function is decreasing from negative infinity to  $-1$  and increasing from  $-1$  to infinity.
- D. The function is decreasing from negative infinity to  $-2$  and increasing from  $-2$  to infinity.

7. What are the  $x$ -intercepts for the function  $f(x) = x^2 + 2x - 15$ ?
- A. (0,  $-5$ ), (0, 3)    B. (0, 5), (0,  $-3$ )
- C. (5, 0), ( $-3$ , 0)    D. ( $-5$ , 0), (3, 0)

8. Which of the following is a horizontal asymptote of  $f(x) = \frac{1}{x^2 - 16}$ ?

- A.  $x = -4$     B.  $y = 4$
- C.  $x = 1$     D.  $y = 0$

9. Which choice *best* describes the part of the graph from  $x = -2$  to  $x = 0$ ?



- A. nonlinear and decreasing
- B. linear and increasing
- C. linear and decreasing

10. Which of the following is an  $x$ -intercept of  $y = -8x^2 - 10x + 3$ ?

- A. 3      B.  $\frac{1}{4}$       C.  $\frac{2}{3}$       D.  $\frac{3}{2}$

11. What are the  $x$ -intercepts of the graph of  $y = 12x^2 - 5x - 2$ ?

- A. 1 and  $-\frac{1}{6}$       B.  $-1$  and  $\frac{1}{6}$   
C.  $\frac{2}{3}$  and  $-\frac{1}{4}$       D.  $-\frac{2}{3}$  and  $\frac{1}{4}$

12. Where does the minimum value of the function  $y = |x - 5| - 4$  occur?

- A. at  $y = -5$       B. at  $y = 4$   
C. at  $x = 0$       D. at  $x = 5$

13. What are the zeros of  $f(x) = x^4 - 7x^3 + 15x^2 - 9x$ ?

- A.  $x = 1, x = 3$   
B.  $x = 0, x = 1$   
C.  $x = 0, x = 1, x = 3$   
D.  $x = 0, x = 1, x = 2, x = 3$

14. When is  $f(x) = x^2 - x - 12$  increasing?

- A.  $x > \frac{1}{2}$       B.  $x < \frac{1}{2}$   
C.  $x > -3$       D.  $x < 4$

15. Which point is an  $x$ -intercept of  $f(x) = \frac{4x + 1}{x^2 - 1}$ ?

- A.  $(-1, 0)$       B.  $(-0.25, 0)$   
C.  $(0.25, 0)$       D.  $(1, 0)$

16. At what  $x$ -coordinate does  $f(x) = |-2x + 3| - 2$  have its minimum value?

- A.  $-2$       B.  $-\frac{2}{3}$       C.  $\frac{3}{2}$       D. 3

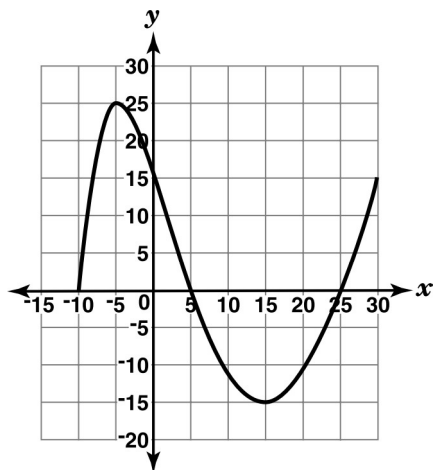
17. Which is an  $x$ -intercept of  $y = 2x^2 - 7x + 3$ ?

- A.  $-\frac{1}{2}$       B.  $\frac{1}{2}$       C.  $-3$       D.  $\frac{7}{4}$

18. How many times does the graph of  $y = 2x^2 - 2x + 3$  intersect the  $x$ -axis?

- A. none      B. one      C. two      D. three

19. Look at the function that is graphed below.



What are the maximum and minimum values of this function?

- A. maximum 15, minimum  $-5$
- B. maximum 25, minimum  $-15$
- C. maximum 25, minimum  $-10$
- D. maximum 30, minimum  $-10$

20. What are the *approximate* zeros of the function  $f(x) = x^3 - 2x^2 - 3x + 1$ ?

- A.  $\{3, -1\}$
- B.  $\{4, 0\}$
- C.  $\{-1.2, 0.3, 2.9\}$
- D.  $\{-1.1, 0.2, 3.0\}$