TEST NAME: **F-IF.7 NEW**
TEST ID: **976768**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **School Assessment**

Student:

Class:

Date:

Read the passage - 'Wendy's Novel' - and answer the question below:

Wendy's Novel

Wendy's Novel

Wendy wrote her first novel. Patrick, a publisher, helped her edit and publish the book through online retailers.

Patrick developed equations designed to model the revenue that he would receive from the sales of the novel and the costs that he would incur. The publisher's share of the revenue, R dollars, is modeled by the equation $R = 5.5n$, where n is the number of novels sold. The cost for Patrick to print the novel and release it to the market, C dollars, is modeled by the equation $C = 2n + 2600$.

Patrick gave Wendy two payment options for her novel. If she chose Option 1, she would receive a $1,000 payment immediately, and then she would earn $0.65 for each book sold. If she chose Option 2, she would receive no initial payment, but she would earn $1.05 for each book sold.

When Wendy's book was released, the sales of the novel started off moderate, increased at a steady rate for the first week, and then decreased at a steady rate. The daily sales of Wendy's novel, s, are modeled by the equation $s = -40|x - 7| + 1000$, where x is the number of days since the book was released. For the first 21 days after the novel was released, Patrick's model was accurate to within 3% of the book's actual sales.

1. Read "Wendy's Novel" and answer the question.

The table displayed below compares the money Wendy would earn using Option 1 versus the amount she would earn using Option 2. The relationship between the amount of money Wendy would earn and the number of books sold is linear.

Books Sold	Option 1	Option 2
10	$1006.50	$10.50
100	$1065	$105
1000	$1650	$1050

Wendy graphs the difference of her earnings using Option 1 minus her earnings using Option 2. What are the *x*-intercept and *y*-intercept of the graph, if either exists?

A. *x*-intercept: 2500

y-intercept: 1000

B. *x*-intercept: 2000

y-intercept: −1000

C. *x*-intercept: 400

y-intercept: 1000

D. There is no *x*-intercept

y-intercept: −1000

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2. **What is the *y*-intercept of the line that passes through the points (1, 0) and (2, −2)?**

A. -2

B. -1

C. 1

D. 2

3. **Which quadratic function opens upward and has its vertex at *x* = 6?**

A. $f(x) = -4x^2 + 48x - 18$

B. $f(x) = -2x^2 + 24x + 12$

C. $f(x) = 3x^2 - 36x + 9$

D. $f(x) = 6x^2 - 8x + 5$

4. **In the graph of the equation $y = x^2 + 2ax$, which expression represents the minimum?**

A. (a, a^2)

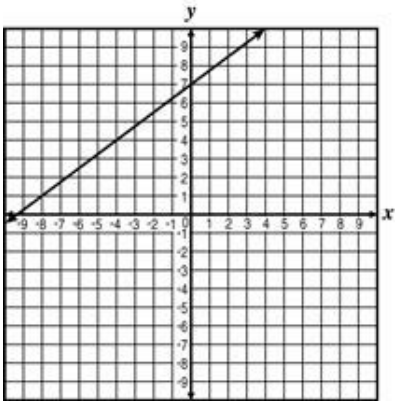
B. $(-a, a^2)$

C. $(-a, -a^2)$

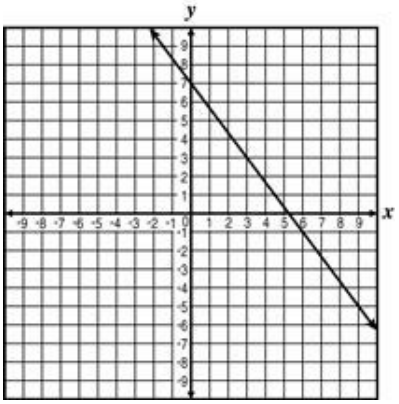
D. It has no minimum.

5. **Which graph best represents** $3y - 4x = 7$?

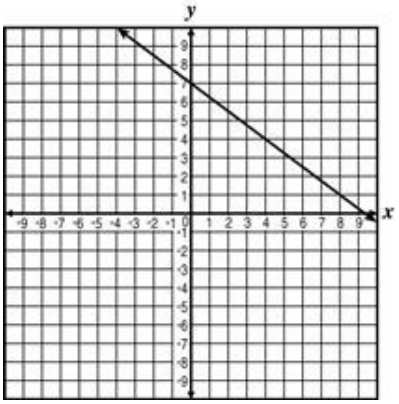
A.



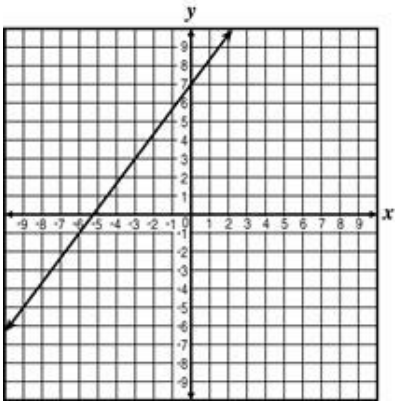
B.



C.

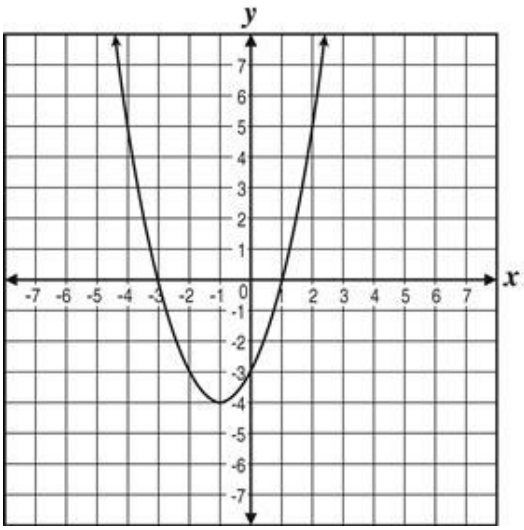


D.

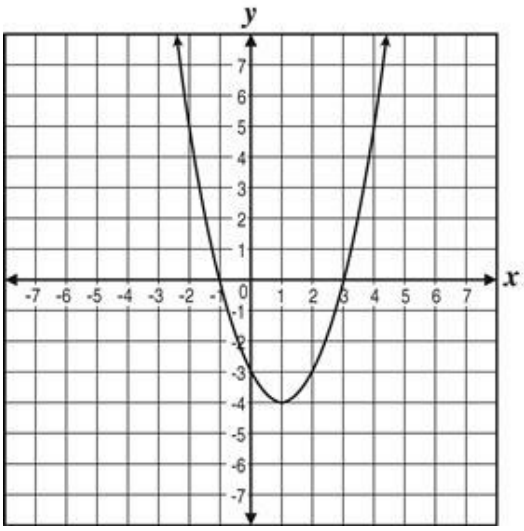


6. **The roots of the quadratic equation** $x^2 + 2x - 3 = 0$ **can be found using which of the following parabolas?**

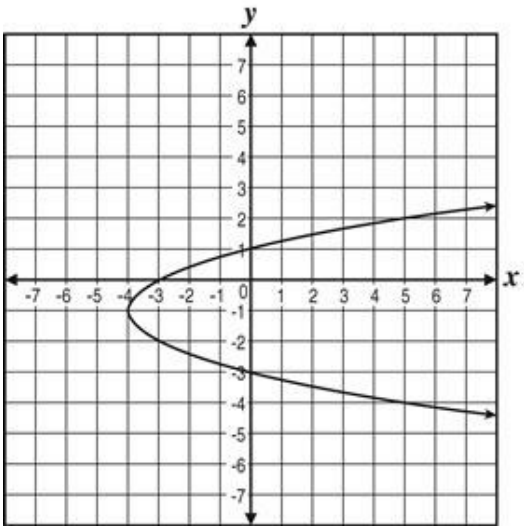
A.



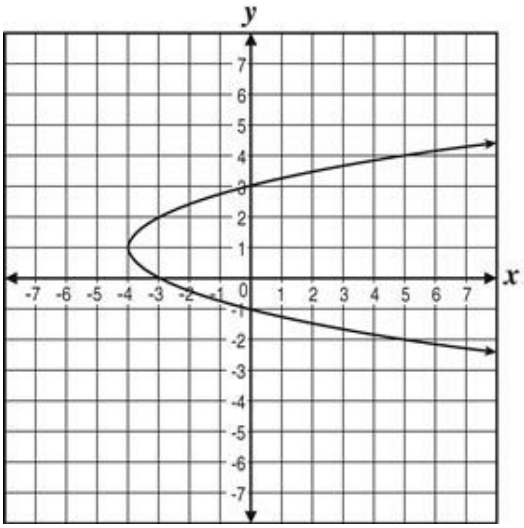
B.



C.



D.

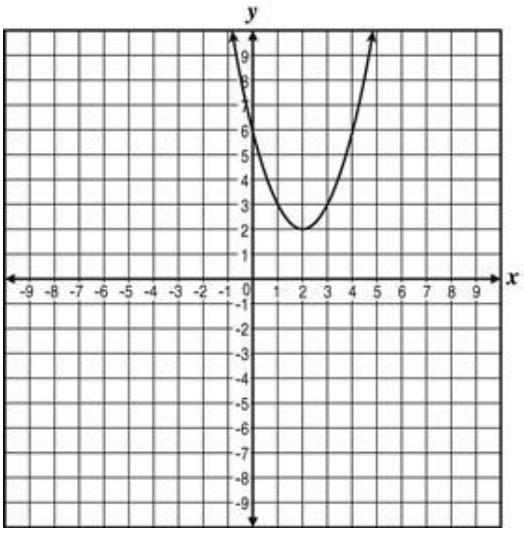


7. **What are the coordinates of the *x*-intercepts of the parabola** $y = x^2 - 8x + 15$?

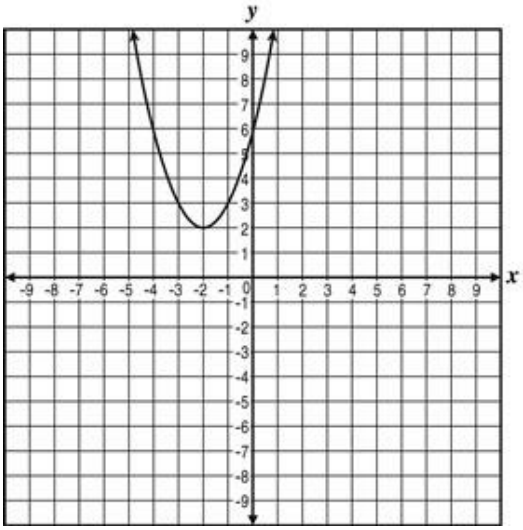
A. (3, 0) and (5, 0)
B. (3, 0) and (–5, 0)
C. (–3, 0) and (5, 0)
D. (–3, 0) and (–5, 0)

8. **Which graph represents** $y = x^2 + 4x + 6$?

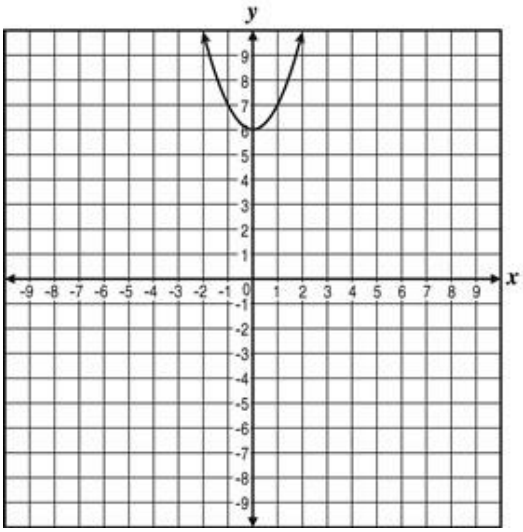
A.



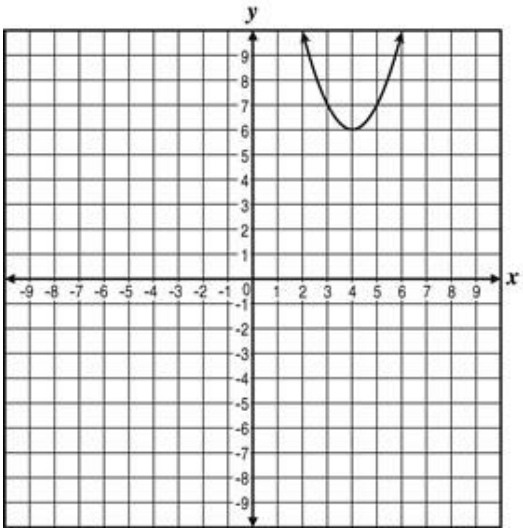
B.



C.

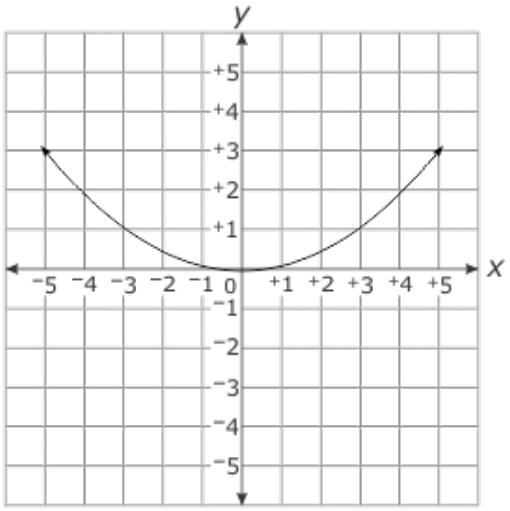


D.

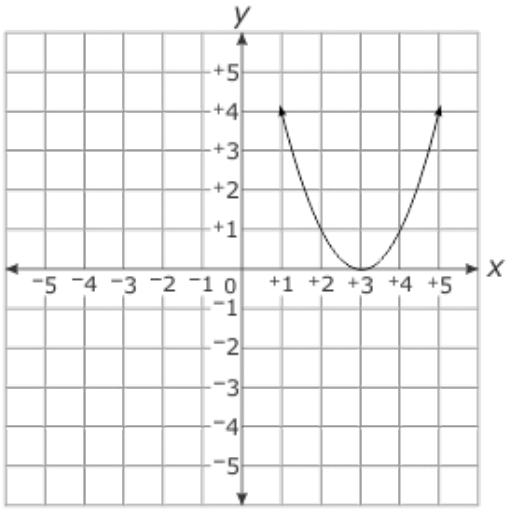


9. Which is the graph of $y = x^2 + 3$?

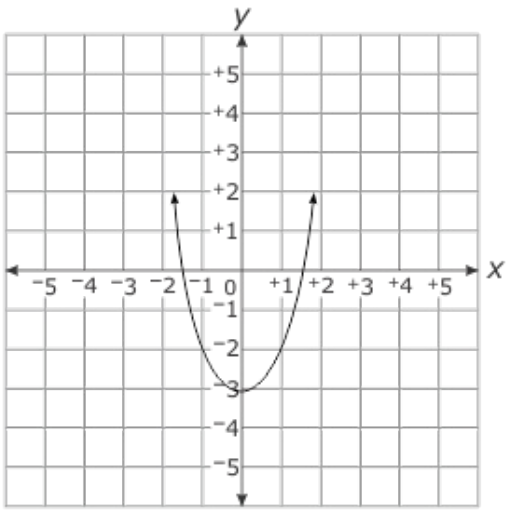
A.


y
x
+5
+4
+3
+2
+1
−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5
−1
−2
−3
−4
−5

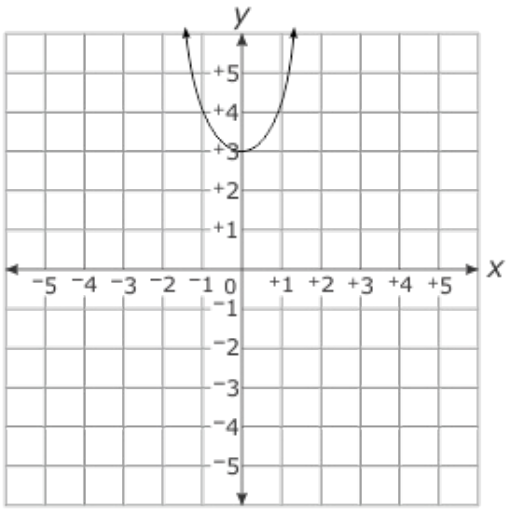
B.


y
x
+5
+4
+3
+2
+1
−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5
−1
−2
−3
−4
−5

C.

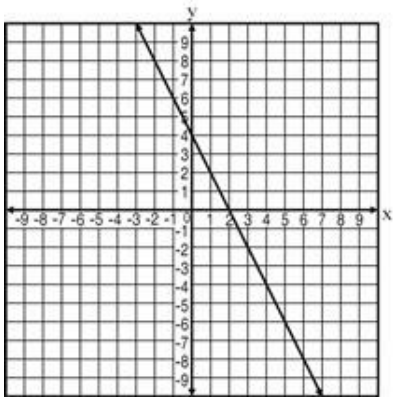

y
x
+5
+4
+3
+2
+1
−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5
−1
−2
−3
−4
−5

D.

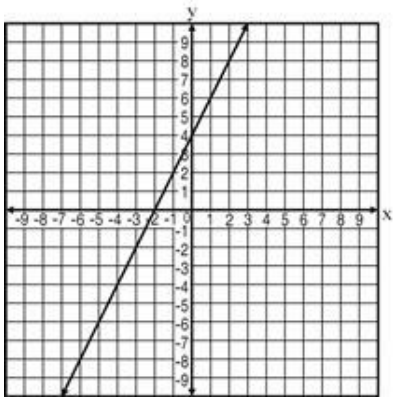


10. **Which of the following is the graph of** $y = 2x + 4$?

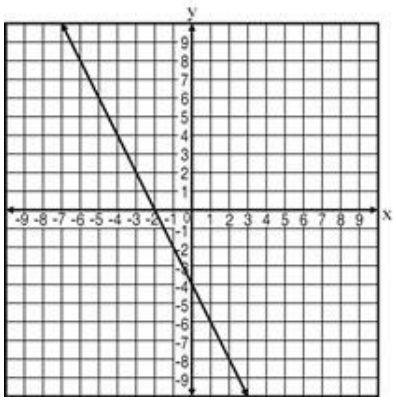
A.



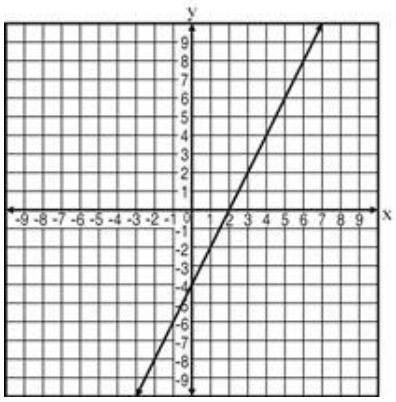
B.



C.

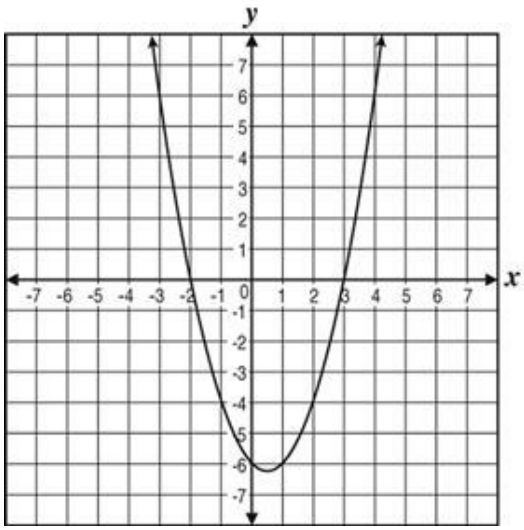


D.

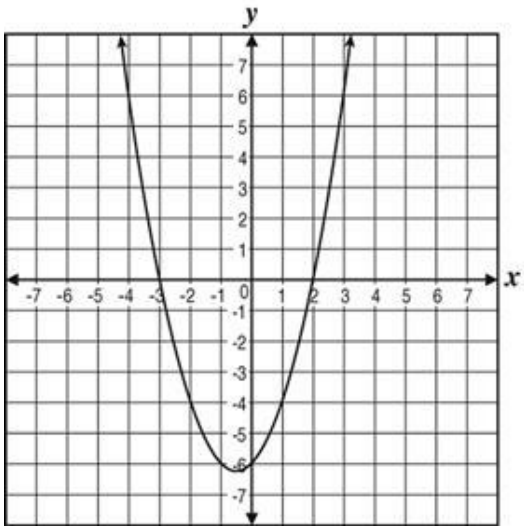


11. **Which of the following graphs has roots at** -2 **and 3?**

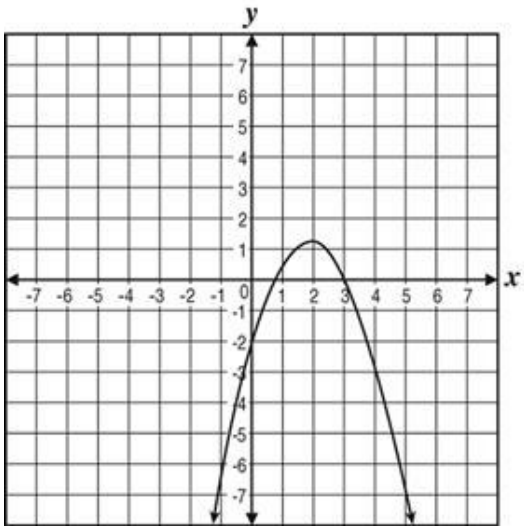
A.



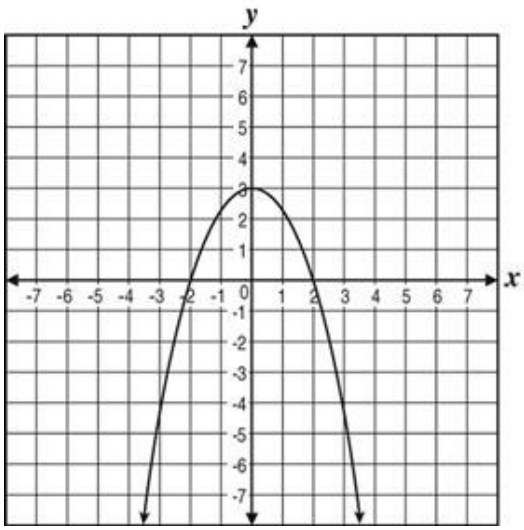
B.



C.

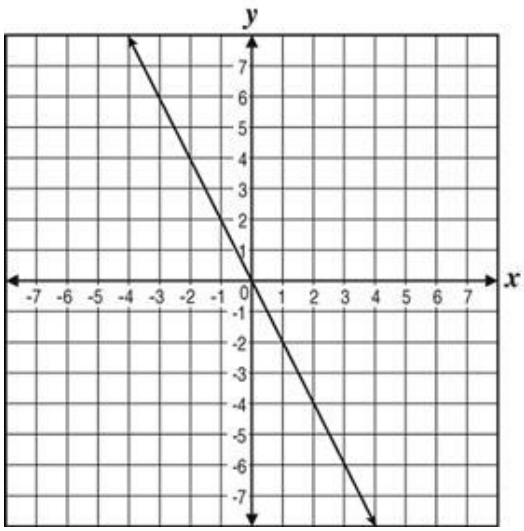


D.

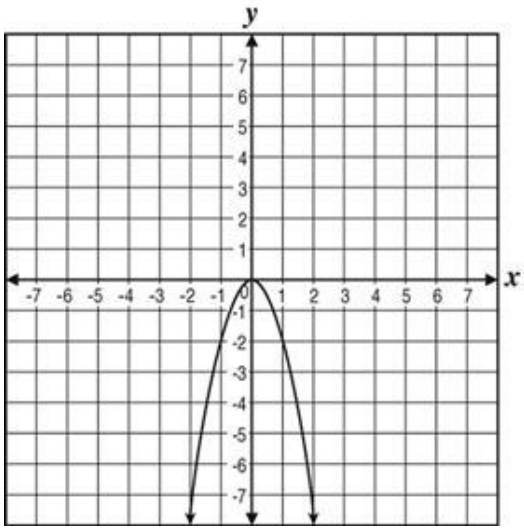


12. **Which graph represents** $y = -2x^2$**?**

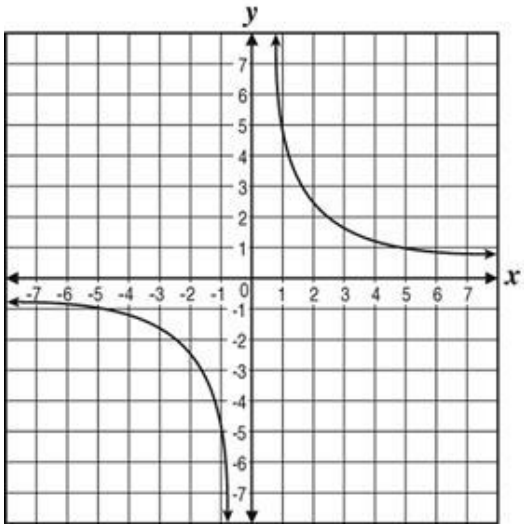
A.



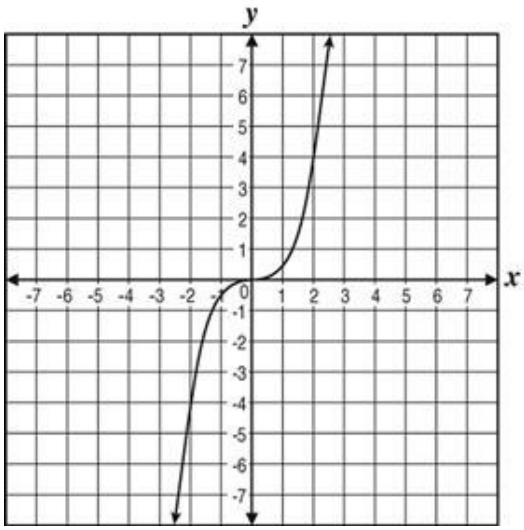
B.



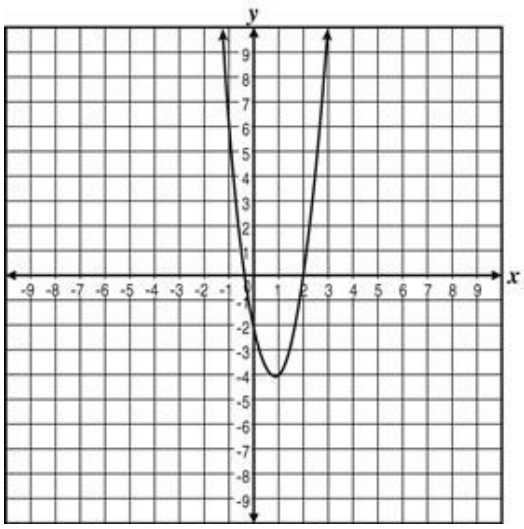
C.



D.



13. **The graph below represents the function** $f(x) = 3x^2 - 5x - 2$.

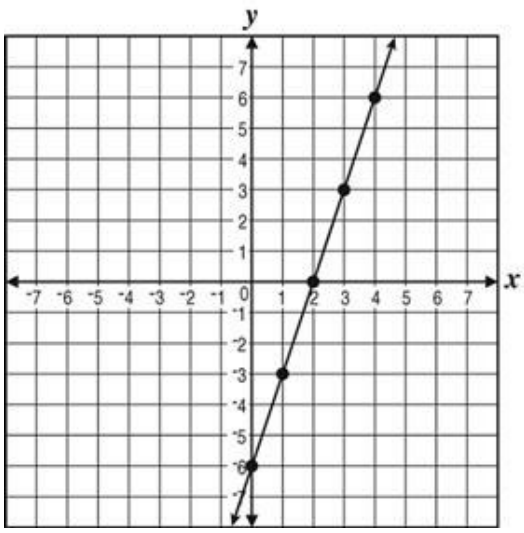


Which statement is true?

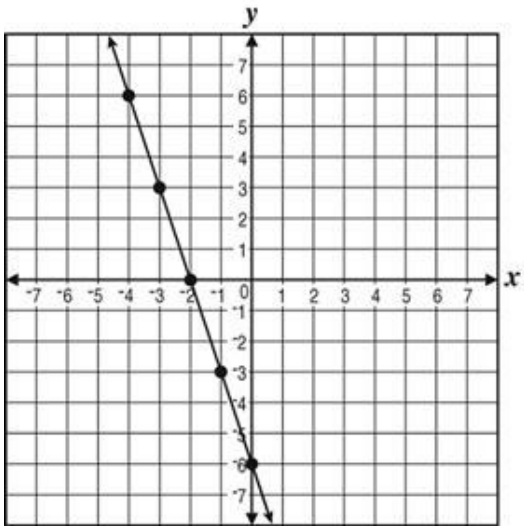
A. The point (0, 2) is an *x*-intercept.
B. The point (2, 0) is an *x*-intercept.
C. The point (2, 0) is a *y*-intercept.
D. The point (0, 2) is a *y*-intercept

14. **Which graph best represents the equation** $y = -3x + 6$?

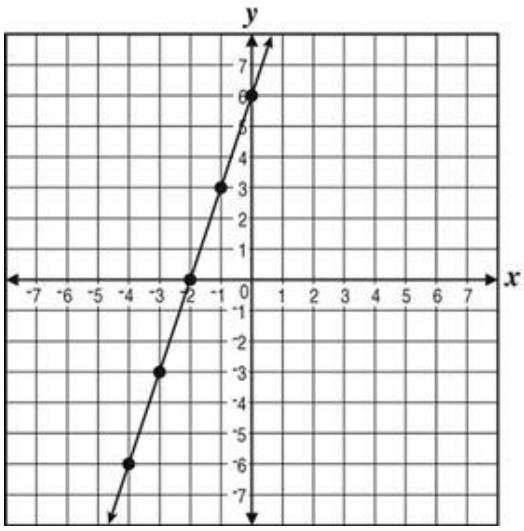
A.



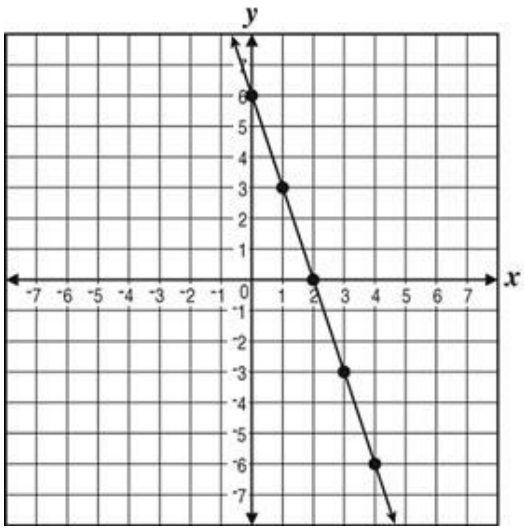
B.



C.



D.

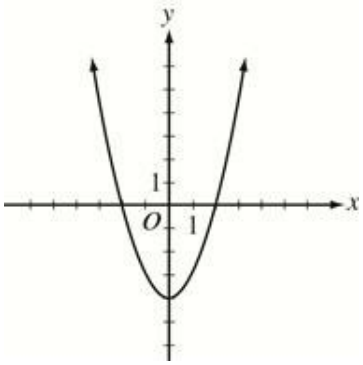


15. **What is the *y*-intercept of the graph of the equation** $y = 2(x-3)^2 + 7$?

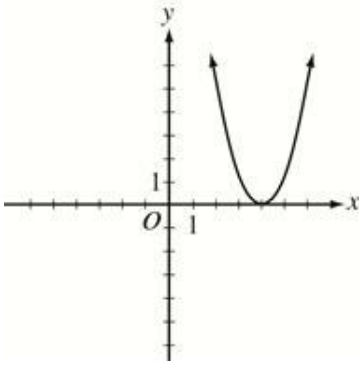
A. –3
B. 6
C. 7
D. 25

16. **Which of the following is the graph of** $y = -x^2 + 4$?

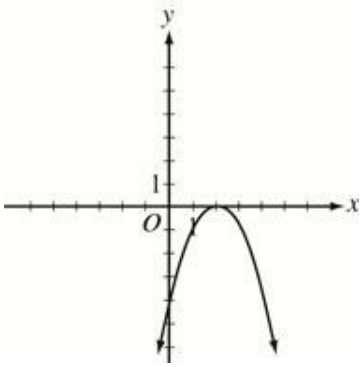
A.



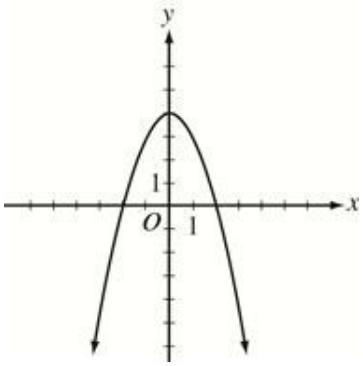
B.



C.



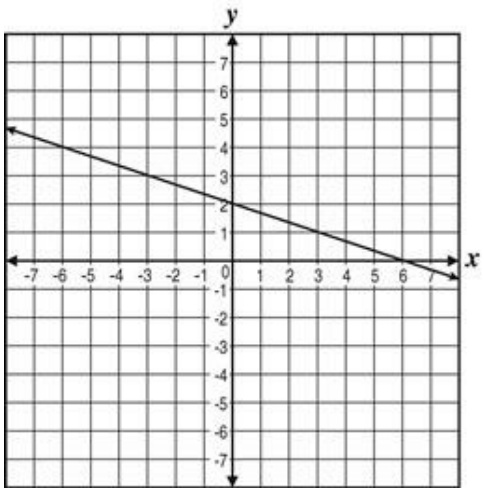
D.



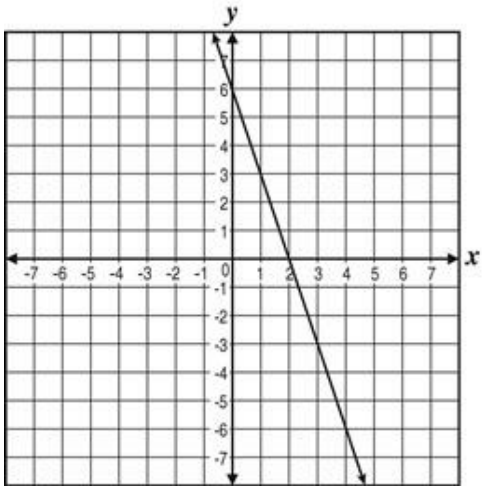
17. **Which grid correctly shows the graph of the equation shown below?**

$3x + y = 6$

A.



B.



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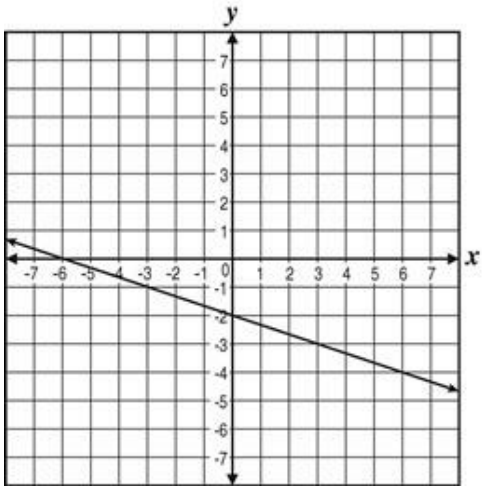
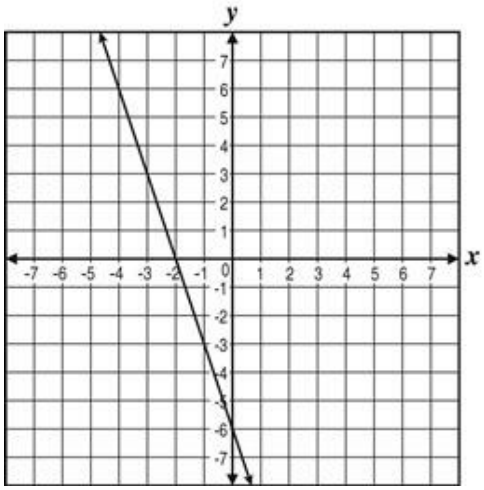
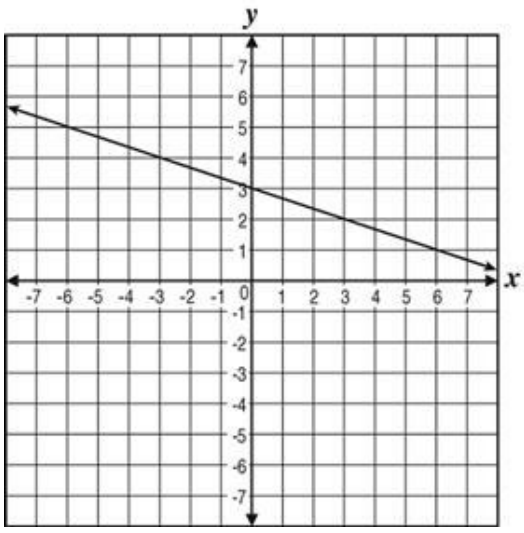


D.

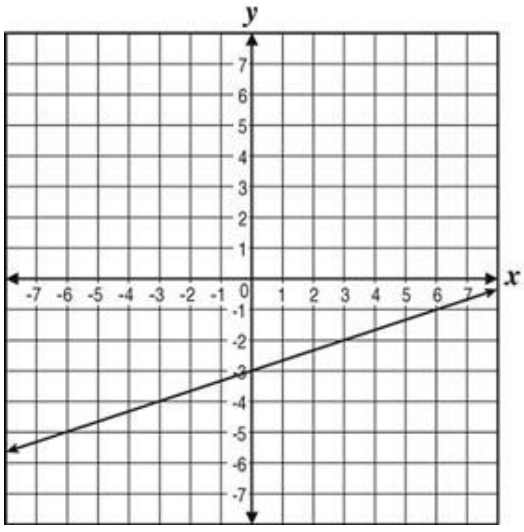


18. **Which of the following graphs represents the equation** $x - 3y = -9$**?**

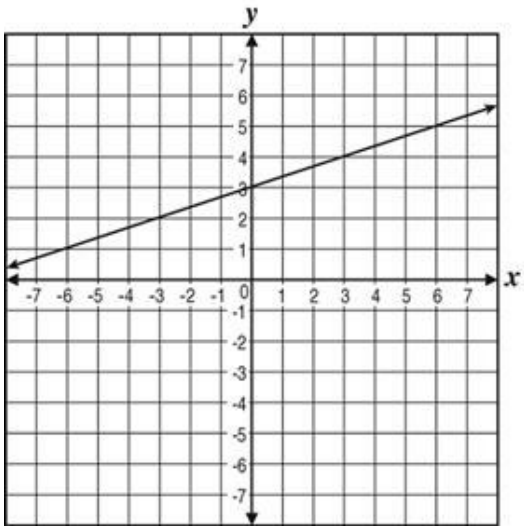
A.



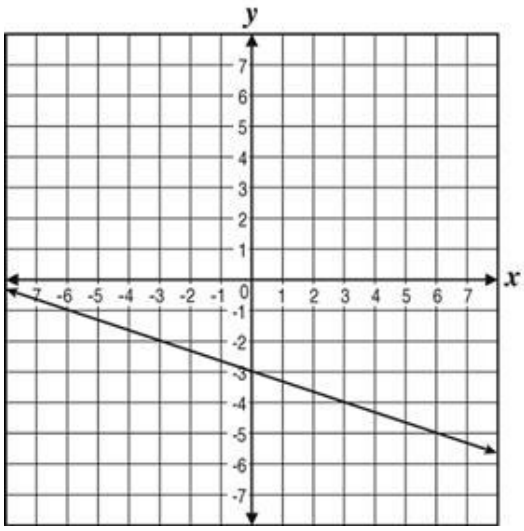
B.



C.



D.



19. **Which of the following is represented by a graph that opens downward and has its vertex at (8, 36)?**

A. $y = -8x^2 + 36x$

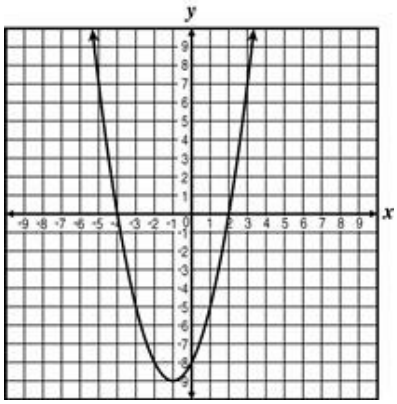
B. $y = 36x^2 - 8x$

C. $y = -\frac{1}{2}x^2 + 8x + 4$

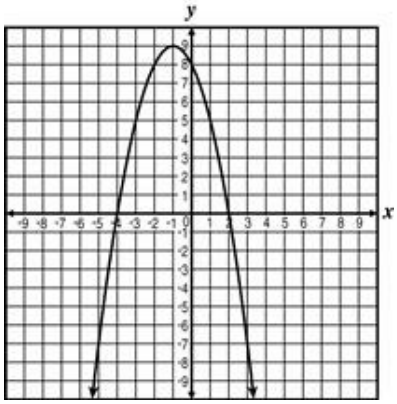
D. $y = \frac{1}{2}x^2 - 8x + 4$

20. **Which graph represents the function** $y = (x - 4)(x + 2)$?

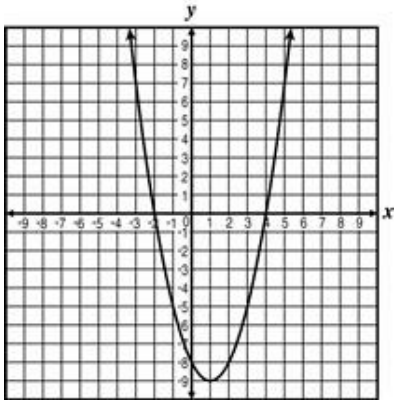
A.



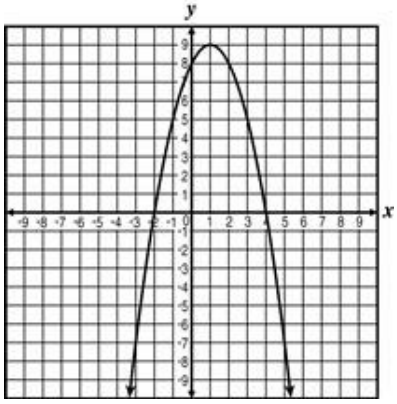
B.



C.

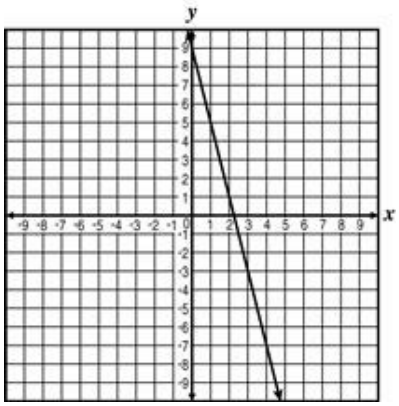


D.

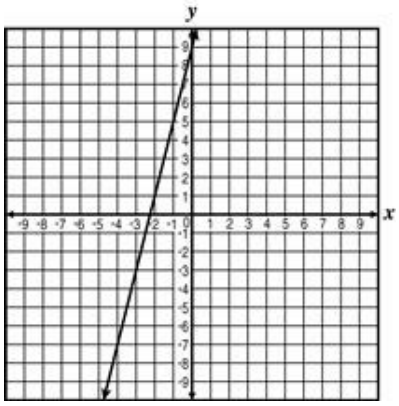


21. **Which graph best represents $-8x + 2y = 18$?**

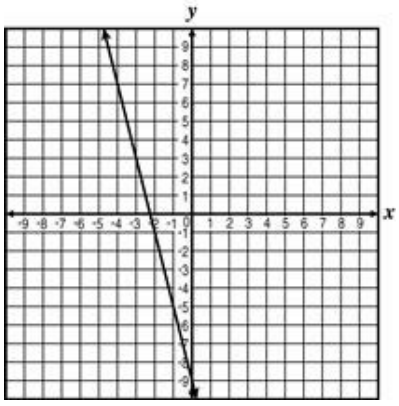
A.



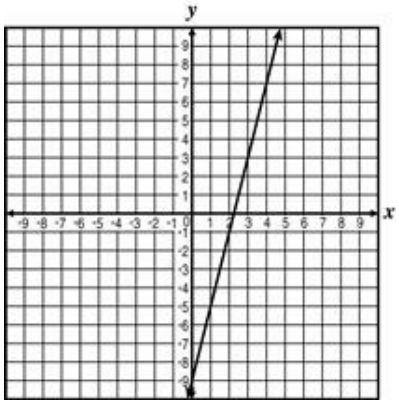
B.



C.

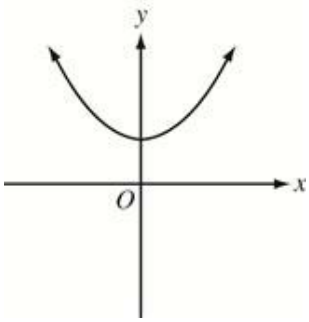


D.

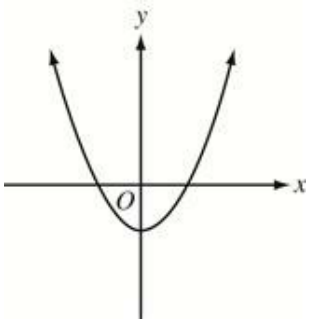


22. **Which of the following could be the graph of** $y = ax^2 + bx$ **if** $a \neq 0$ **and** $b \neq 0$?

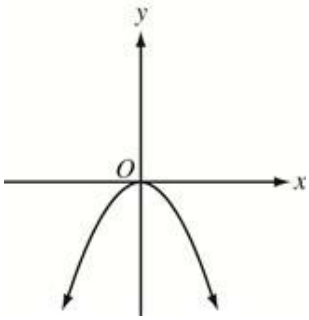
A.



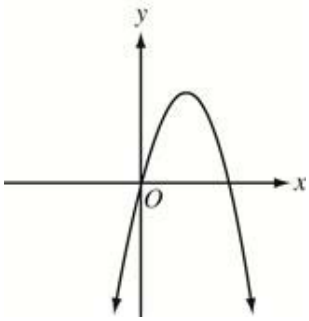
B.



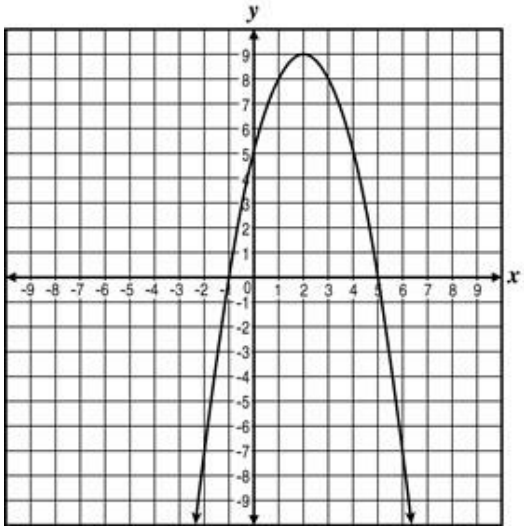
C.



D.



23. **Which table of *x*- and *y*-values is best represented by the graph below?**



A.

x	y
5	0
2	9
0	4
1	8
0	–1

B.

x	y
–1	0
0	5
1	8
2	9
5	0

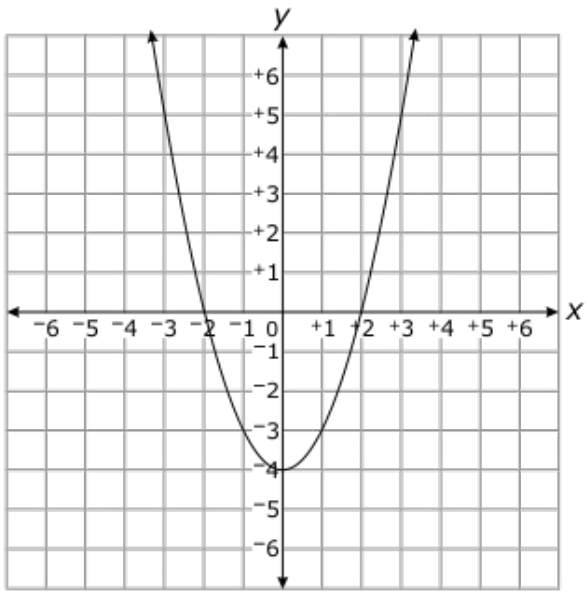
C.

x	y
0	–1
5	0
8	1
9	2
0	4

D.

x	y
–1	0
0	4
1	8
2	9
4	0

24. Which is an equation of the function graphed below?



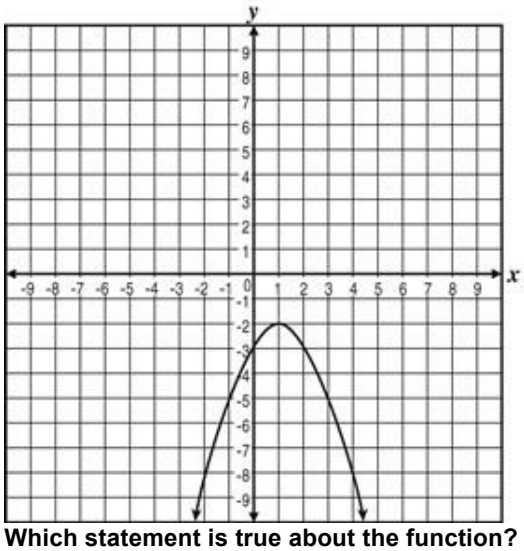
A. $y = x^2 - 4x$

B. $y = x^2 + 4x$

C. $y = x^2 - 4$

D. $y = x^2 + 4$

25. **This graph shows a quadratic function.**



Which statement is true about the function?

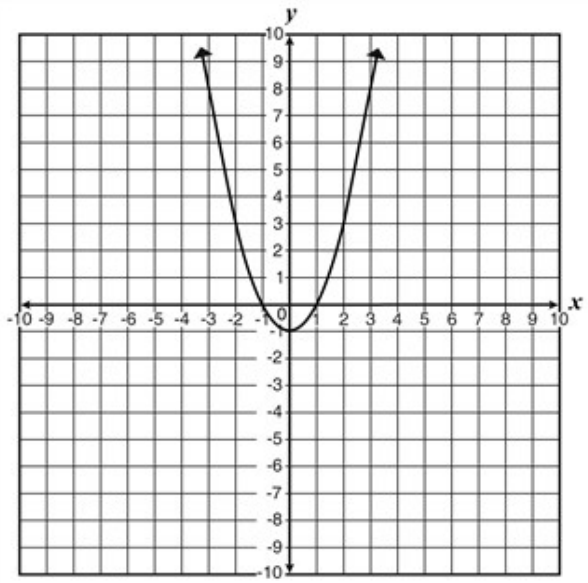
A. The function has a zero at (0, –2).

B. The function has a minimum value.

C. The function has a range of all real numbers.

D. The graph of the function has one *y*-intercept and no *x*-intercepts.

26. **The graph of a quadratic equation is shown in the coordinate plane.**



Which function matches this graph?

A. $y = x^2 - 1$

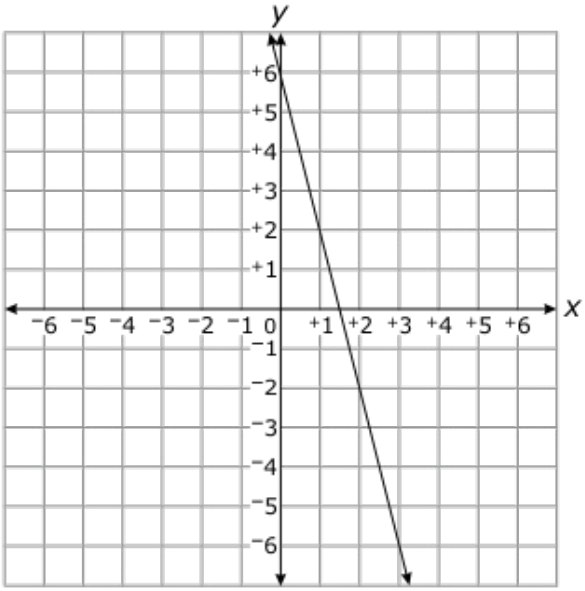
B. $y = x^2 + 1$

C. $y = x^2 - 2x + 1$

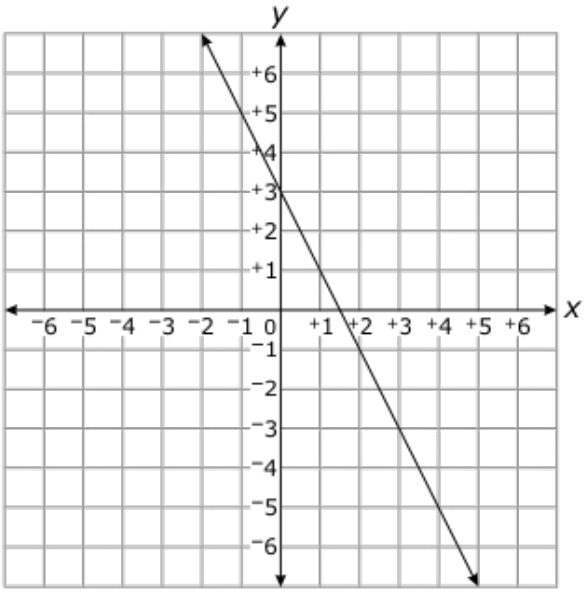
D. $y = x^2 + 2x + 1$

27. Which graph models the function $2(2x + y) = 6$?

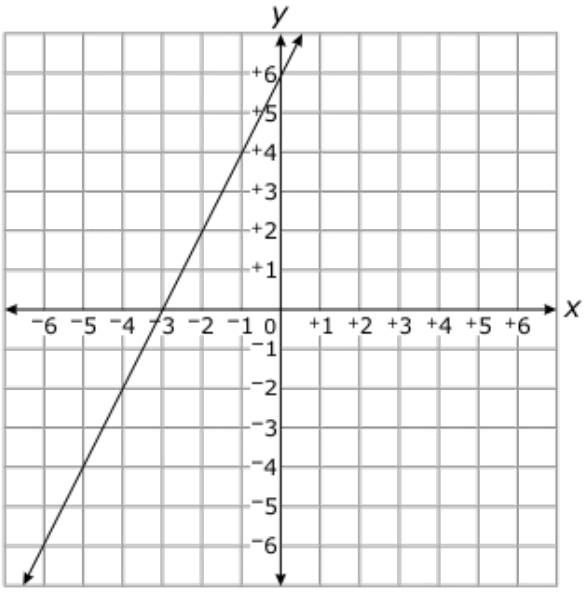
A.



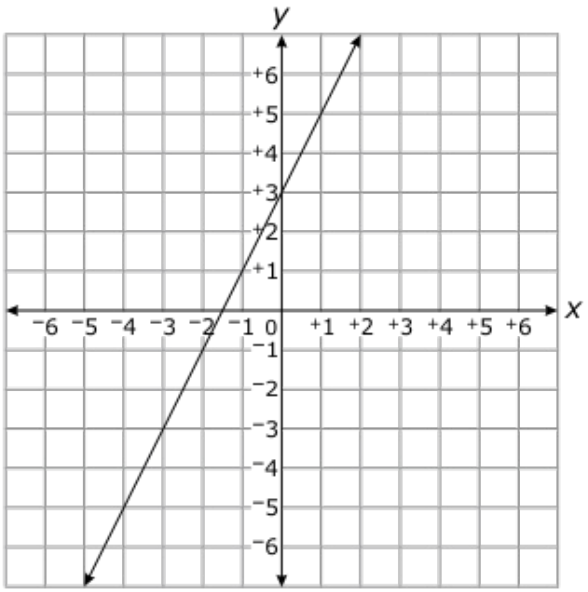
B.


y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

C.

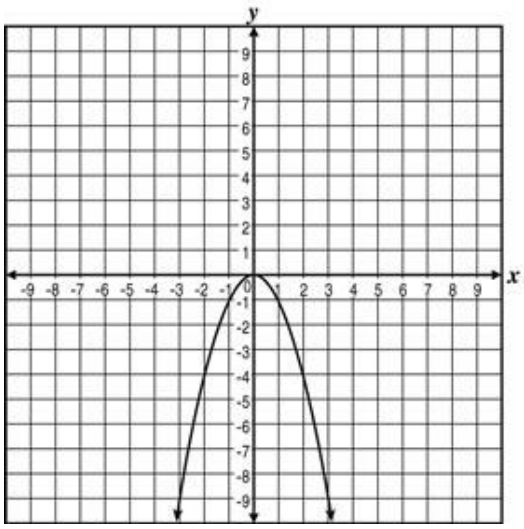

y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

D.

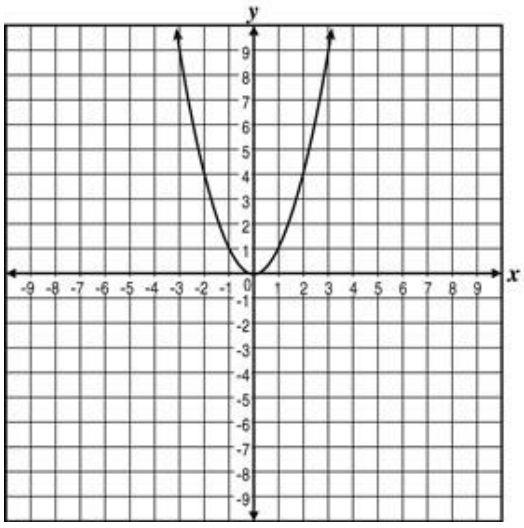


28. **Which graph best represents the equation** $y = x^2$?

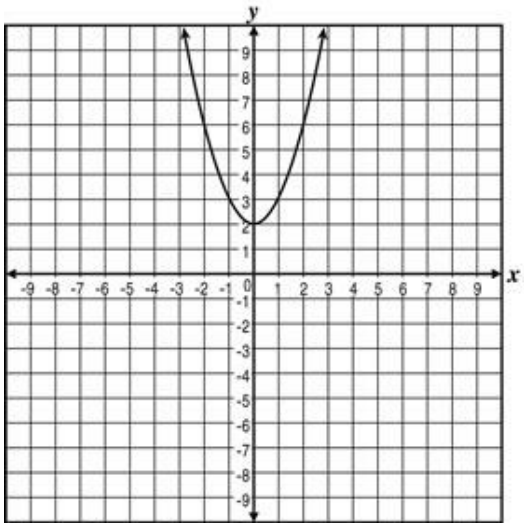
A.



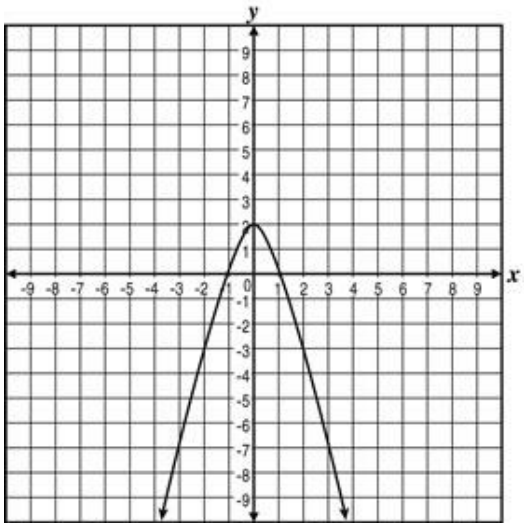
B.



C.



D.



29. **The graph of which quadratic function opens downward at vertex (2, 5)?**

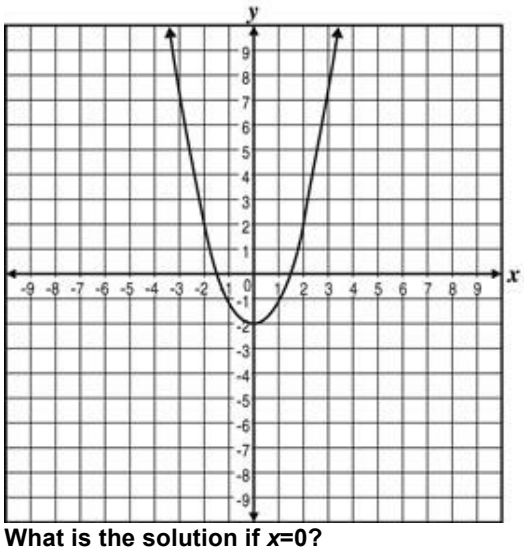
A. $f(x) = -x^2 - 4x + 1$

B. $f(x) = -x^2 + 4x + 1$

C. $f(x) = x^2 - 4x + 9$

D. $f(x) = x^2 + 4x + 9$

30. **The graph of $y = x^2 - 2$ is shown below.**



What is the solution if *x*=0?

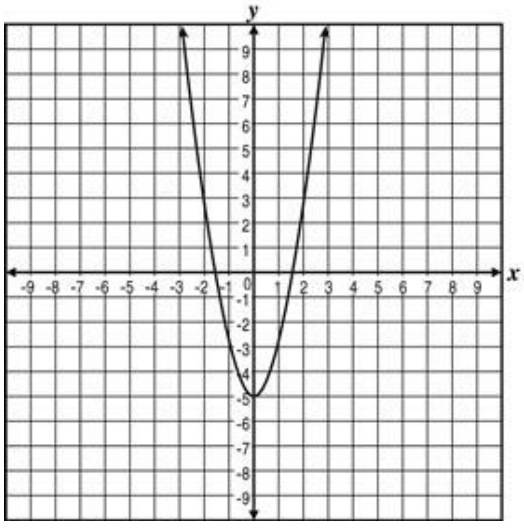
A. -2

B. -1

C. 0

D. 2

31. **Which quadratic equation best represents the graph shown below?**



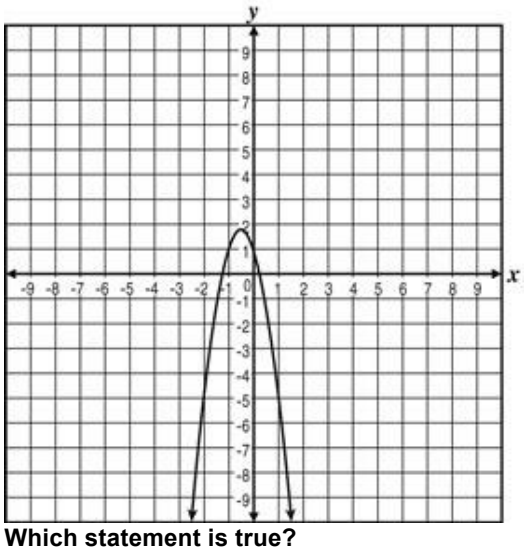
A. $y = -5x^2 - 2$

B. $y = -2x^2 - 5$

C. $y = x^2 - 5$

D. $y = 2x^2 - 5$

32. **This graph represents** $f(x) = 3x^2 - 3x + 1$.



Which statement is true?

A. The line of symmetry is $y = 1$.

B. The line of symmetry is $x = 1$.

C. The *x*-intercept is 1.

D. The *y*-intercept is 1.

33. **What are the coordinates of the *y*-intercept of the graph of *y* = 3*x* – 6?**

A. (2, 0)

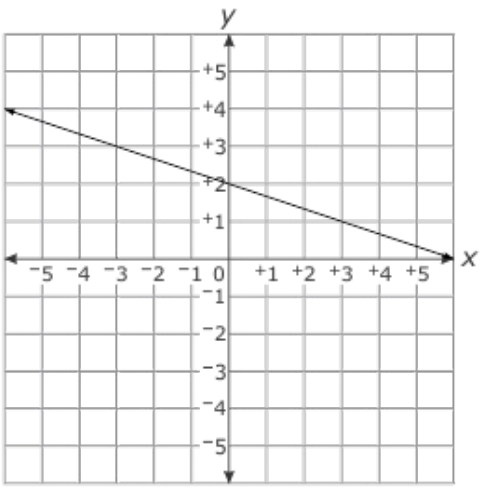
B. (0, 2)

C. $(-6, 0)$

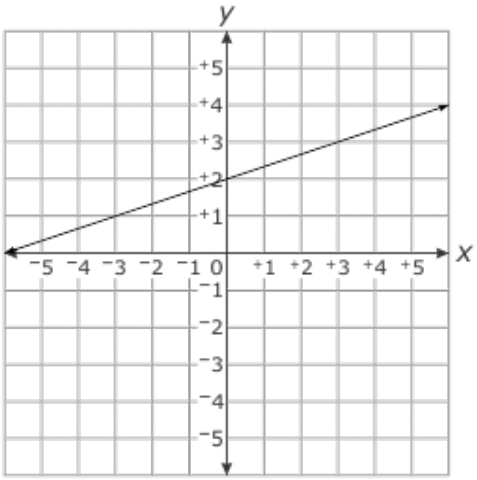
D. $(0, -6)$

34. Which is the graph of $y = \frac{-1}{3}x + 2$?

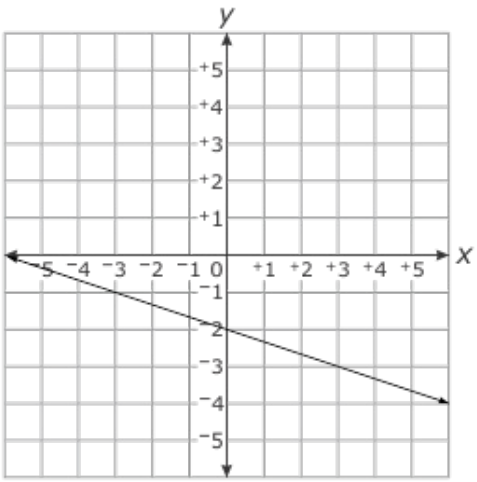
A.



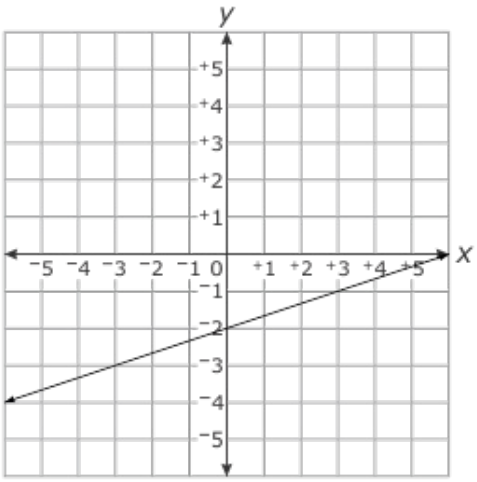
B.



C.

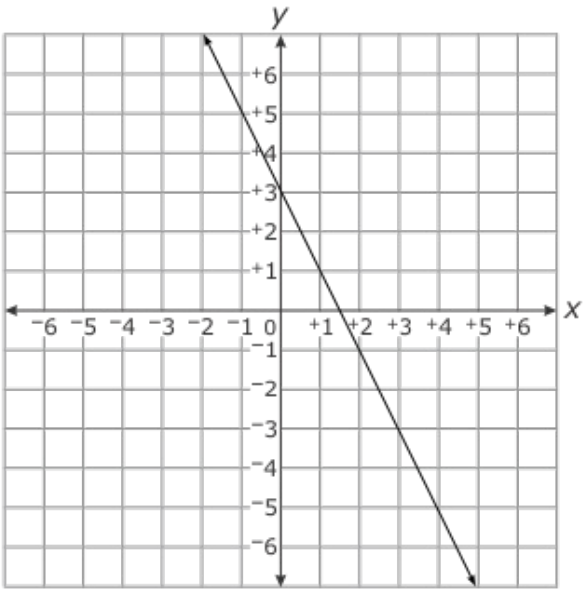


D.

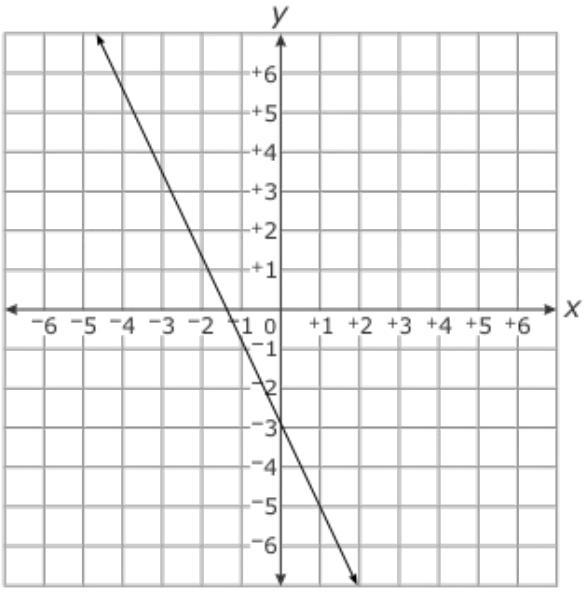


35. Which is the graph of the equation $-3x + 2y = 6$?

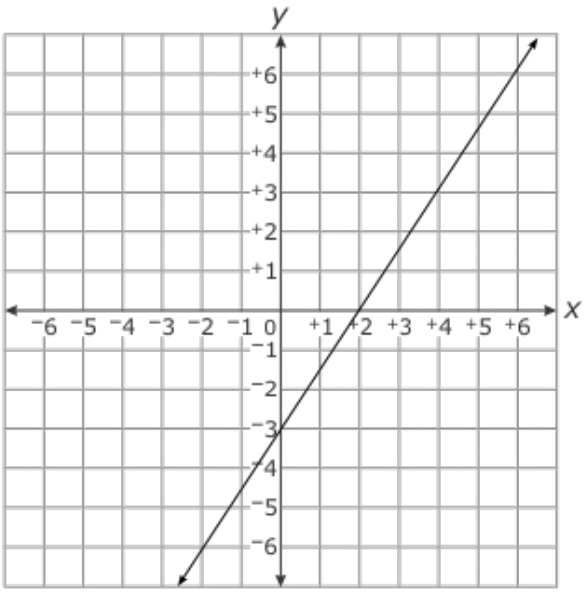
A.


y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

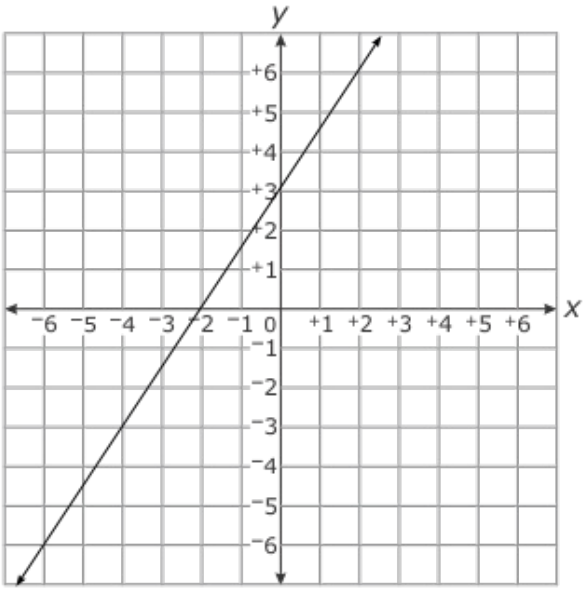
B.


y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

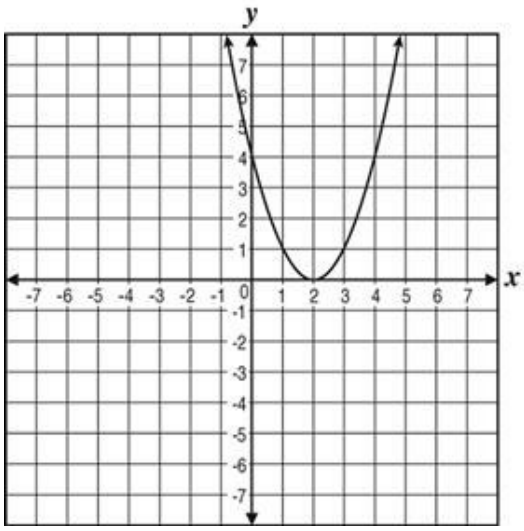
C.


y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

D.

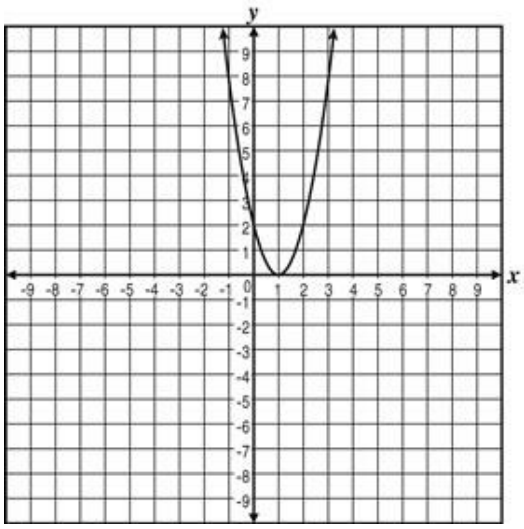

y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

36. **Which point represents the root of the function shown below?**



A. $(0, 4)$
B. $(2, 0)$
C. $(2, 2)$
D. $(4, 4)$

37. **The graph below represents the function** $f(x) = 2x^2 - 4x + 2$.

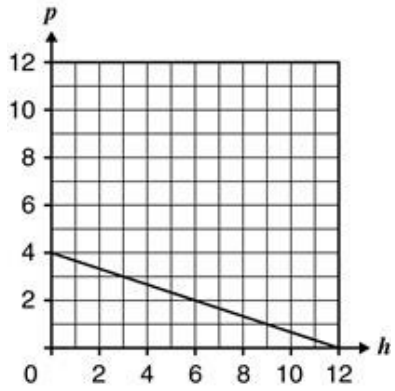


Which statement is true?

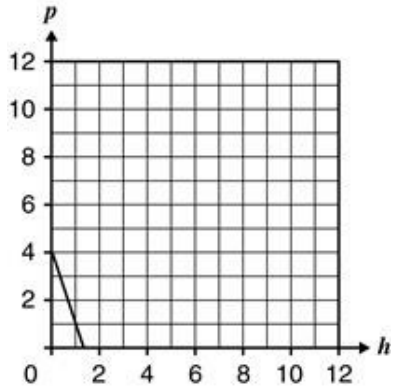
A. The function does not have a *y*-intercept.
B. The function does not have an *x*-intercept.
C. The *x*-intercept and the minimum value are at the same point.
D. The *y*-intercept and the maximum value are at the same point.

38. **Which graph best represents** $h + 3p = 12$, **where** $h > 0$ **and** $p > 0$**?**

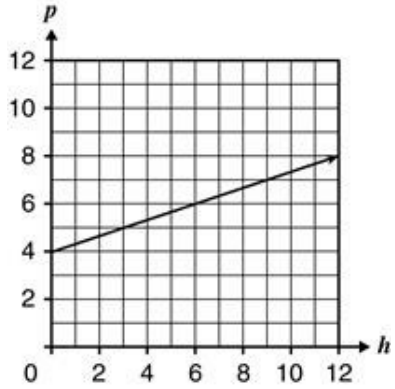
A.



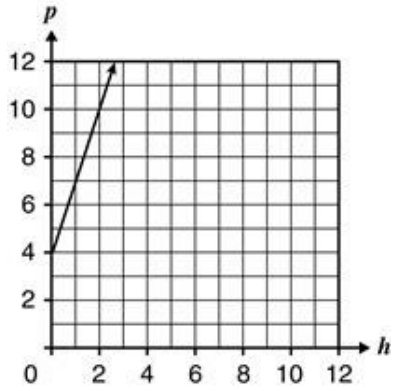
B.



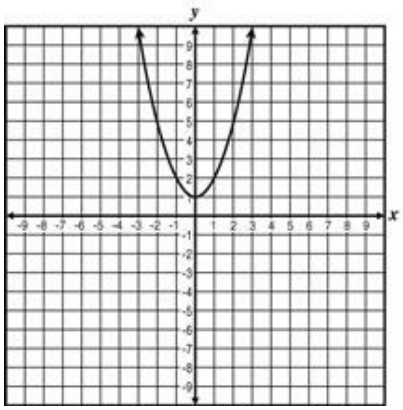
C.



D.



39. **Study this graph of a function.**



Which of these equations represents the function?

A. $f(x) = x^2$

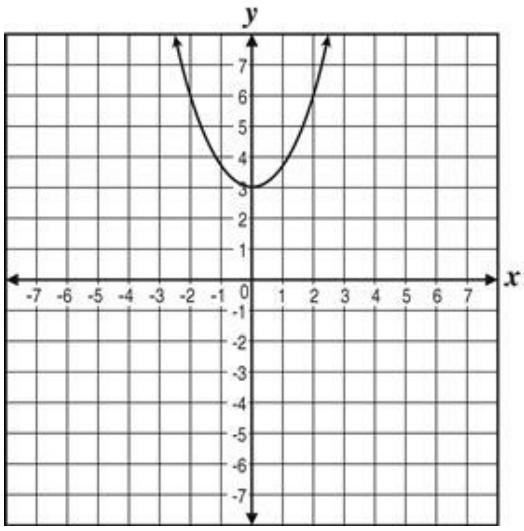
B. $f(x) = x^2 + 1$

C. $f(x) = x^3$

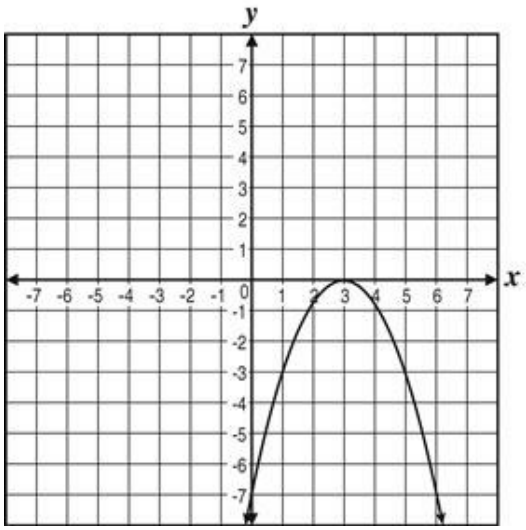
D. $f(x) = x^3 + 1$

40. **Which graph is the graph of an equation that has a double root of 3?**

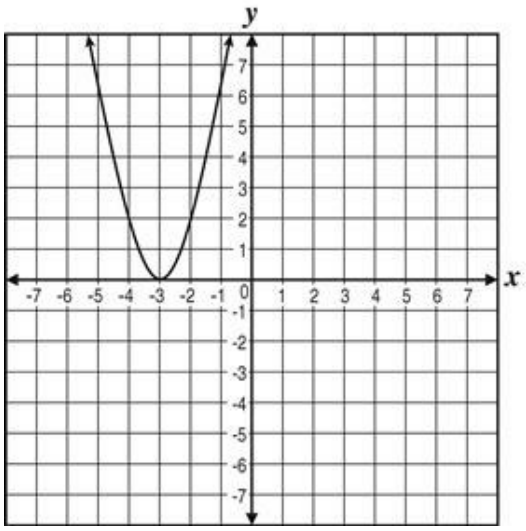
A.



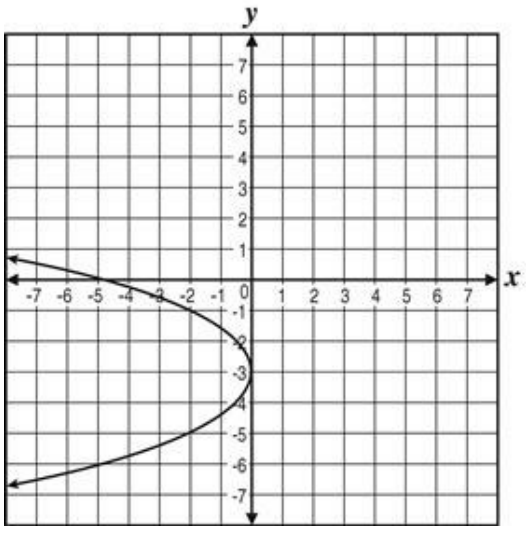
B.



C.

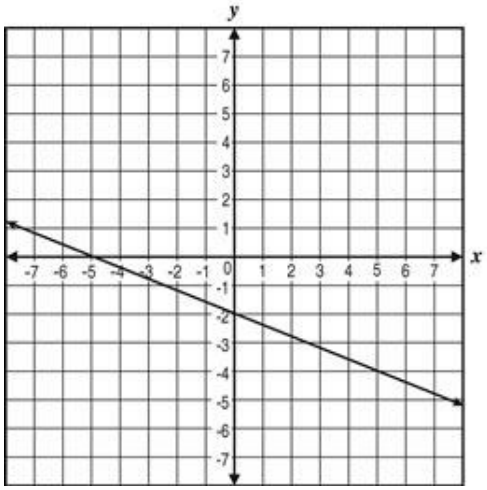


D.

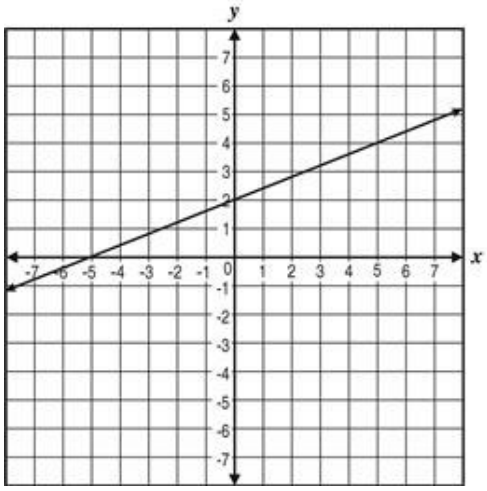


41. **Which graph represents $2x - 5y = 10$?**

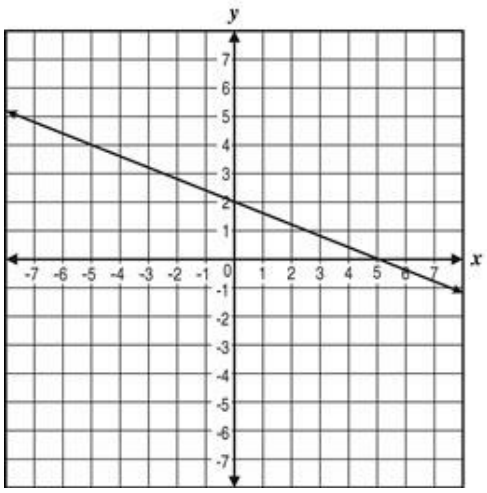
A.



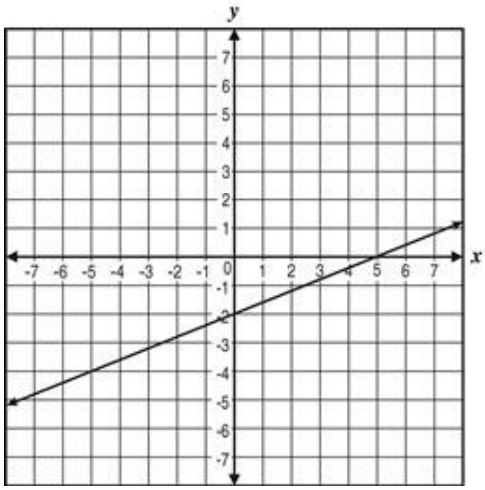
B.



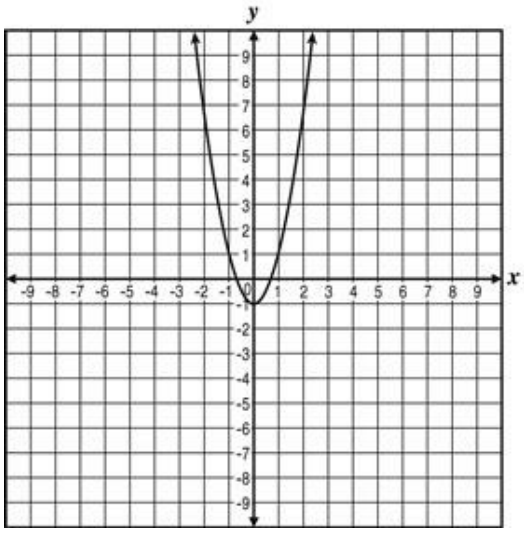
C.



D.



42. **What function is represented on this graph?**



A. $f(x) = 2x^2 - 1$

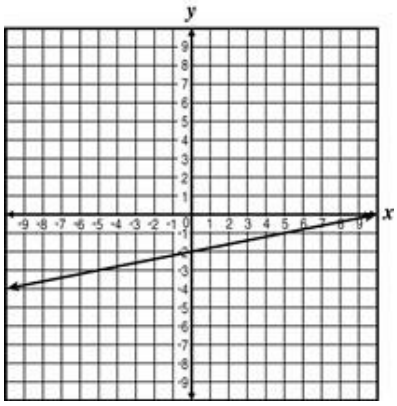
B. $f(x) = x^2 - 1$

C. $f(x) = 2x^2 + 1$

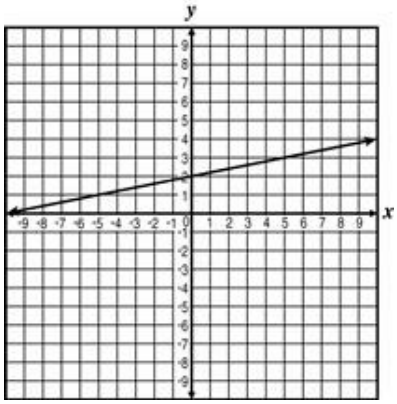
D. $f(x) = x^2 + 1$

43. **Which graph best represents** $x - 5y = 10$**?**

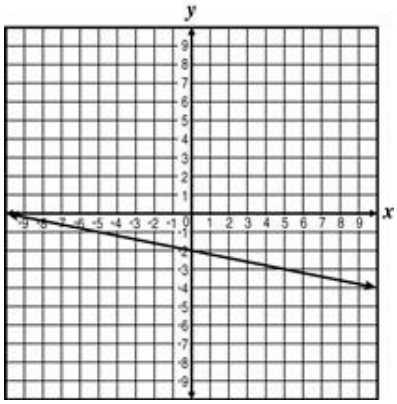
A.



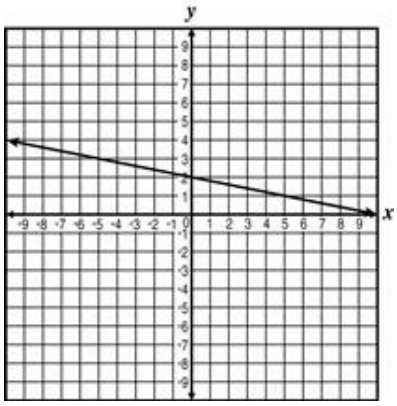
B.



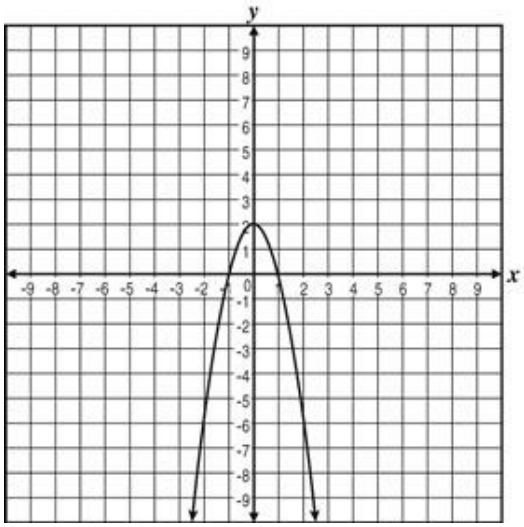
C.



D.



44. **Which describes the zeros and maximum of this graph?**



A. Zeros are –2 and 2; maximum is 6.

B. Zeros are –6 and 6; maximum is 1.

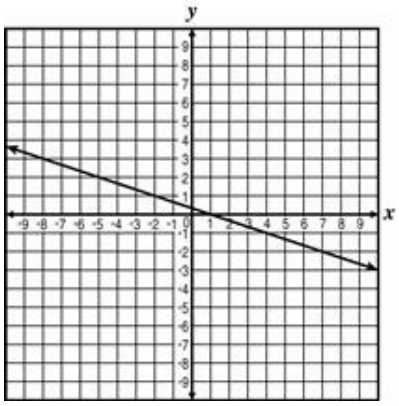
C. Zeros are –1 and 1; maximum is 2.

D. Zero is 2; maximum is 0.

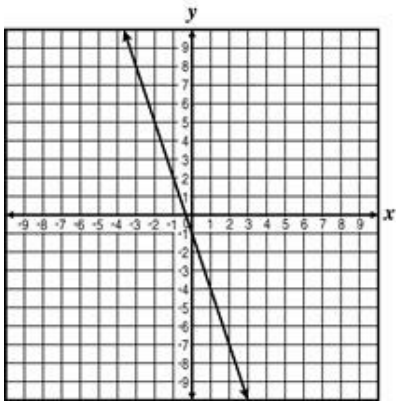
45. **Which graph best represents a line that passes through the values in the table below?**

x	*y*
0	1
1	–2
2	–5

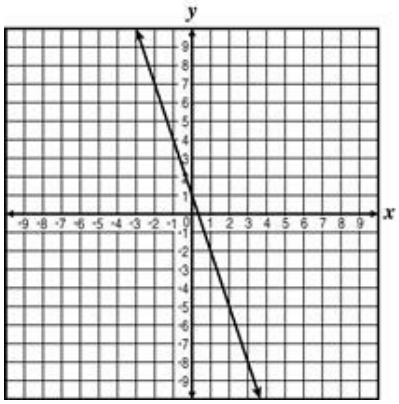
A.



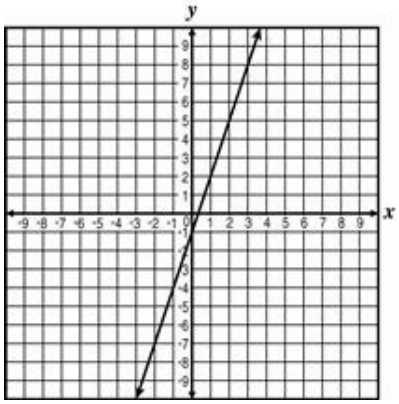
B.



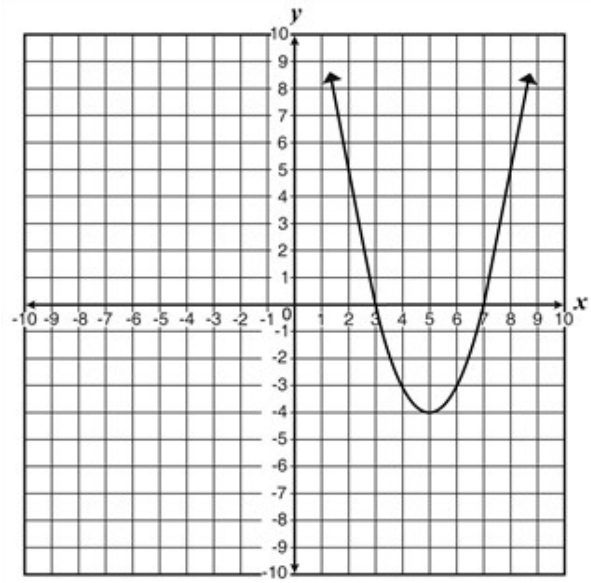
C.



D.



46. **The graph of a quadratic equation is shown.**



Which function matches this graph?

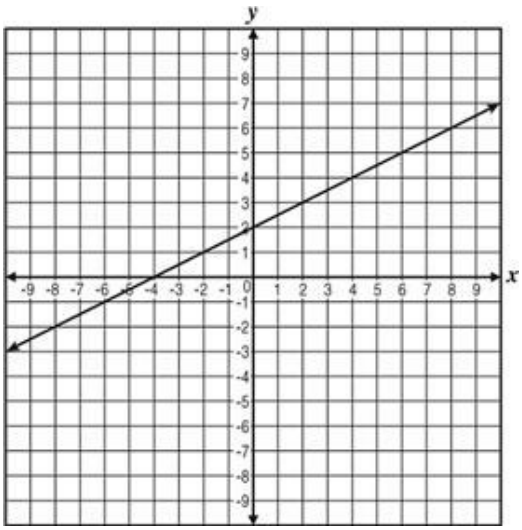
A. $f(x) = x^2 + 10x + 21$

B. $f(x) = x^2 - 10x + 21$

C. $f(x) = x^2 - x - 20$

D. $f(x) = x^2 + x - 20$

47. **What is the equation of the line below?**



A. $y = \frac{1}{2}x + 2$

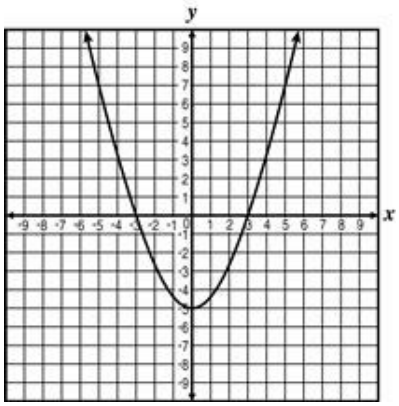
B. $y = \frac{1}{2}x - 2$

C. $y = 2x + 2$

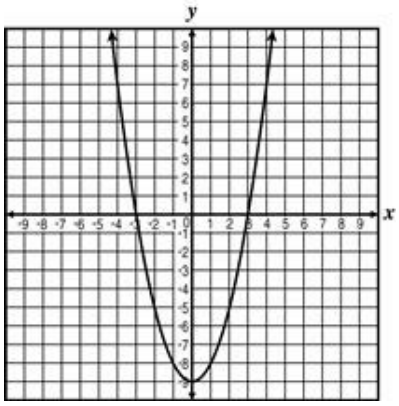
D. $y = 2x - 2$

48. **Which graph best represents the function $f(x) = x^2 - 9$?**

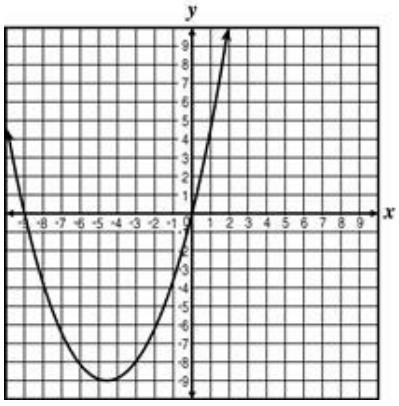
A.



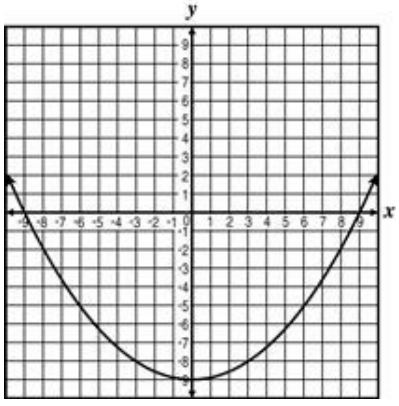
B.



C.

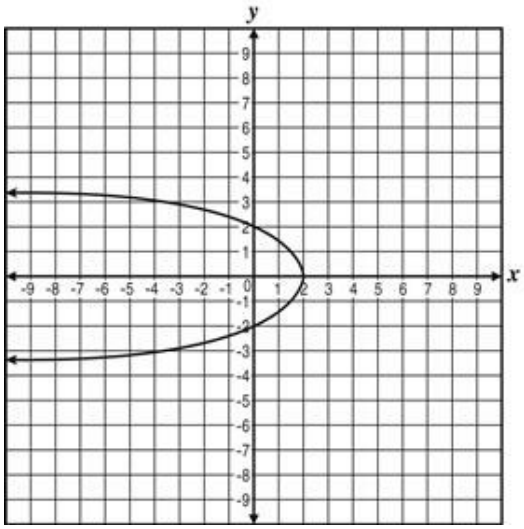


D.

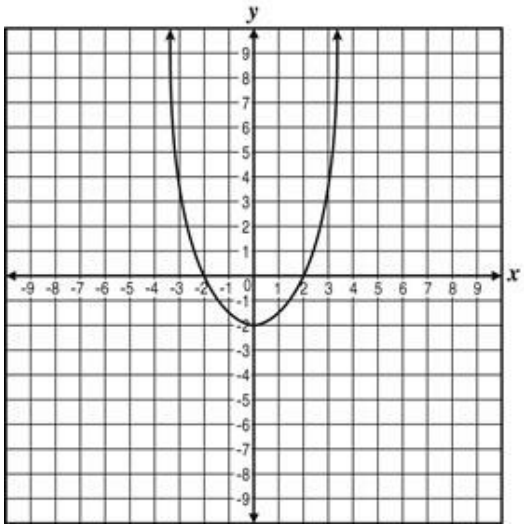


49. **Which graph shows a quadratic function with roots of 2 and –2?**

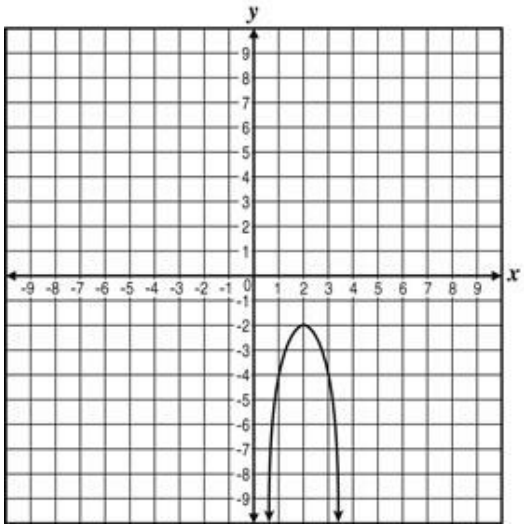
A.



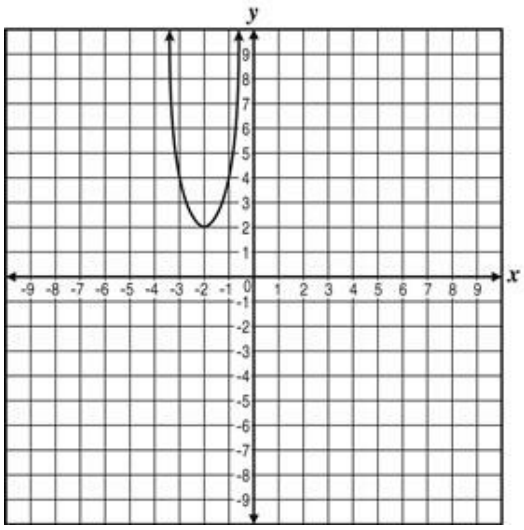
B.



C.



D.



50. **What are the coordinates of the *x*-intercepts of the graph of** $y = (x - 3)(x + 2)$?

A. $(3, 0)$ and $(-2, 0)$

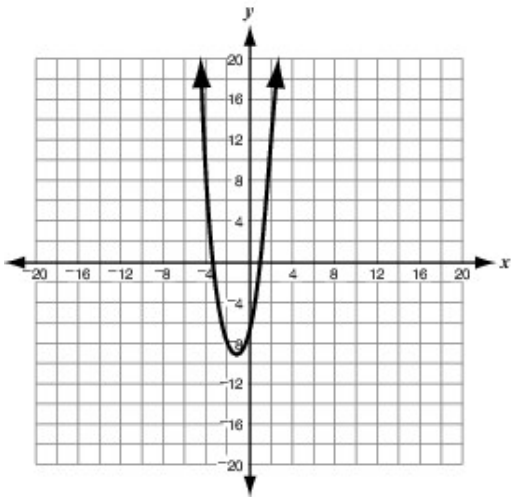
B. $(-3, 0)$ and $(2, 0)$

C. $(0, 3)$ and $(0, -2)$

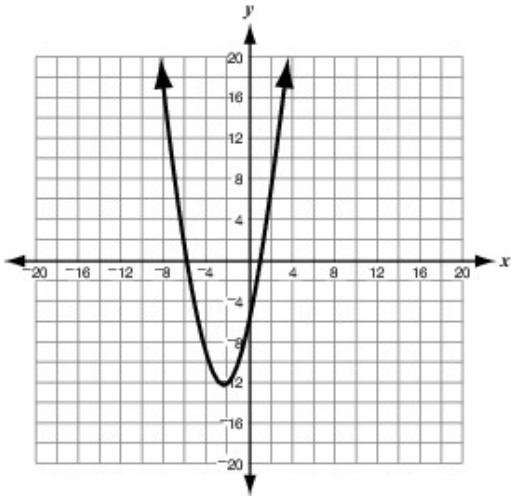
D. $(0, -3)$ and $(0, 2)$

51. Which graph **best** represents the quadratic function $f(x) = 2x^2 + 5x - 6$?

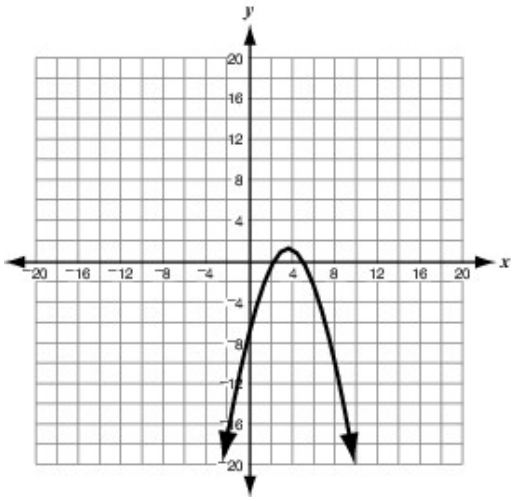
A.



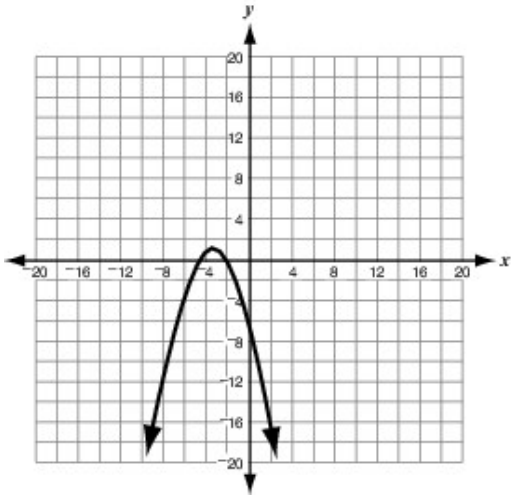
B.



C.



D.



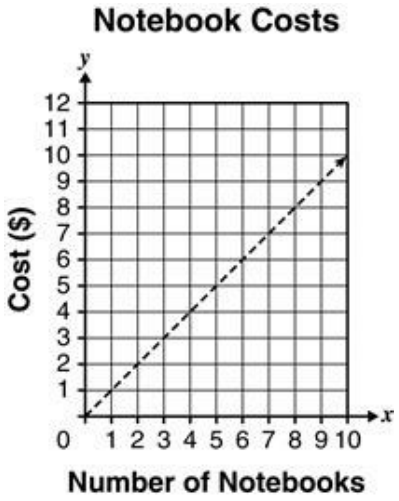
52. **The costs of purchasing various numbers of notebooks are shown in the table.**

Notebook Costs

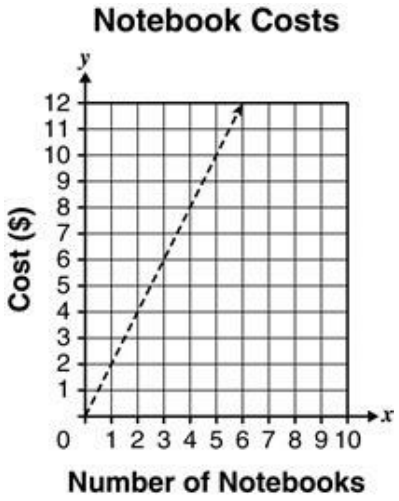
Number of Notebooks	Cost
2	$3
4	$6
6	$9
8	$12

Which graph best represents the information shown in the table?

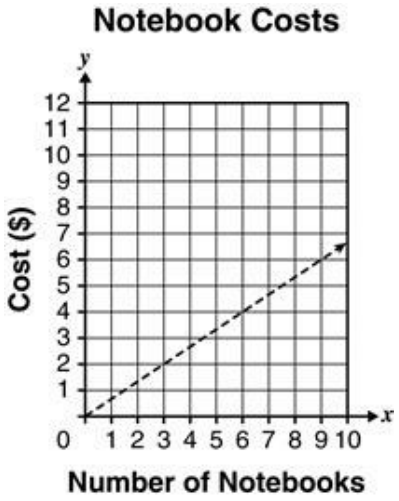
A.



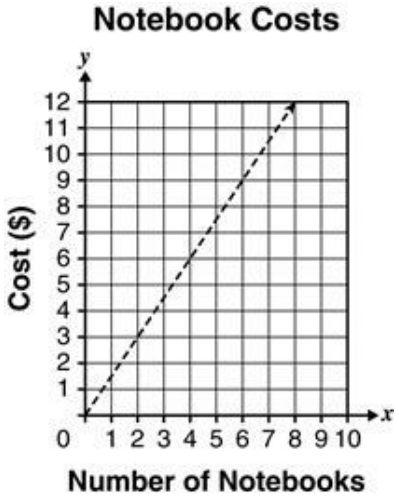
B.



C.



D.



53. **Which coordinate pair represents the *x*-intercept of the graph of the equation $3x - 2y = 12$ in the coordinate plane?**

A. $(-6, 0)$

B. $(0, -6)$

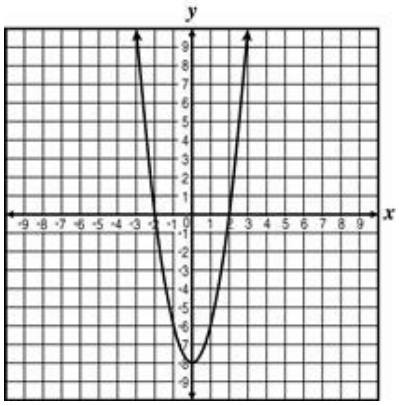
C. $(0, 4)$

D. $(4, 0)$

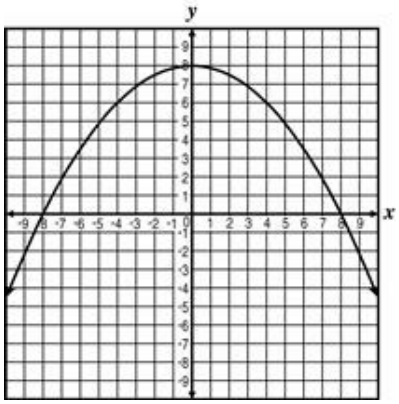
54. **Which graph best represents the table of *x*- and *y*-values below?**

x	*y*
–3	10
–1	–6
1	–6
2	0

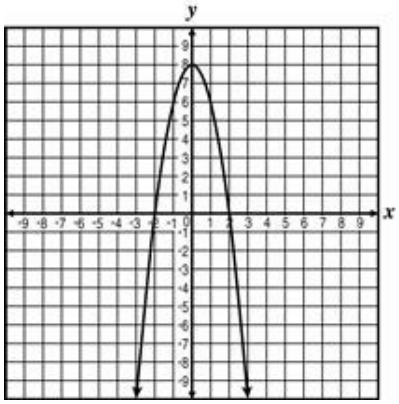
A.



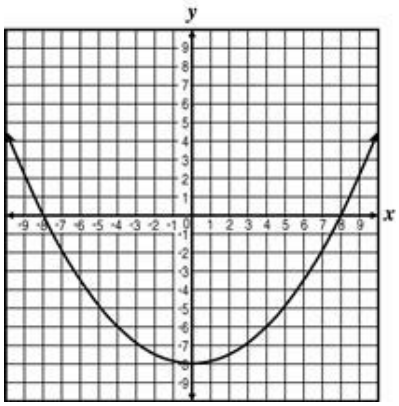
B.



C.

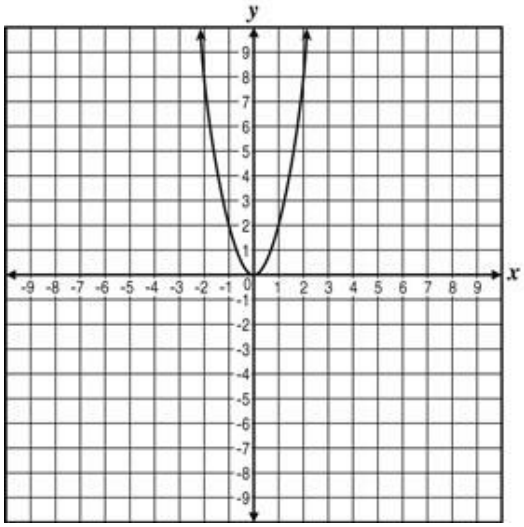


D.

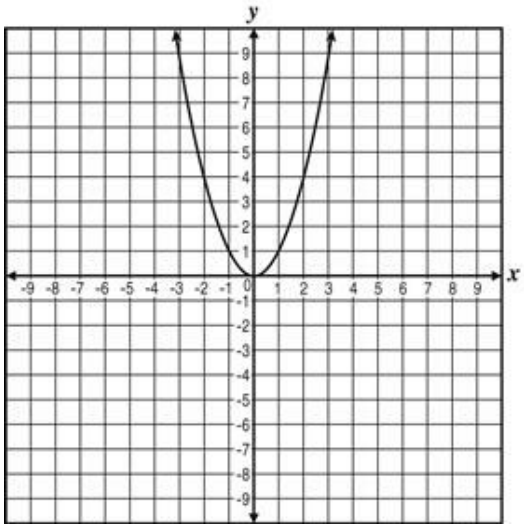


55. **Candice graphed the function $y = 2x^2$. Which graph shows this function?**

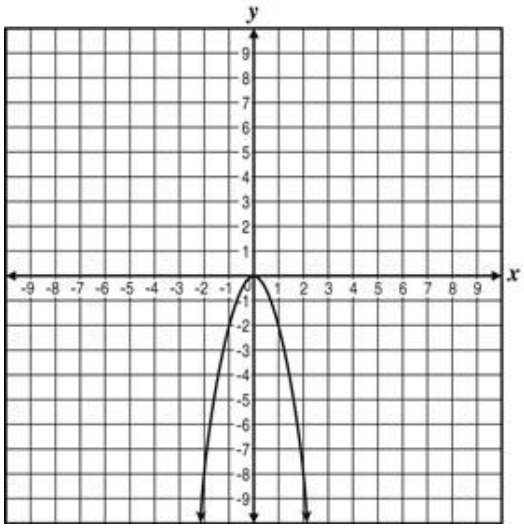
A.



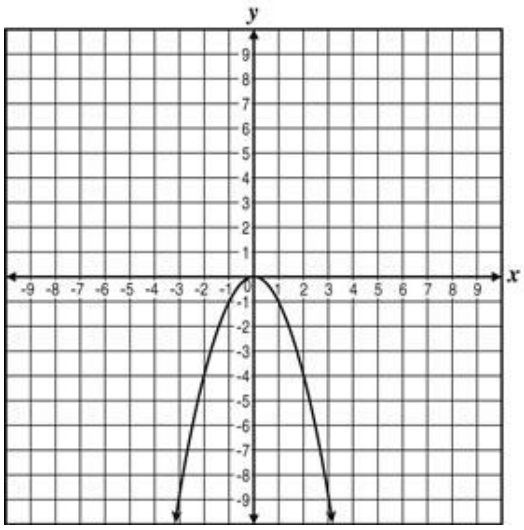
B.



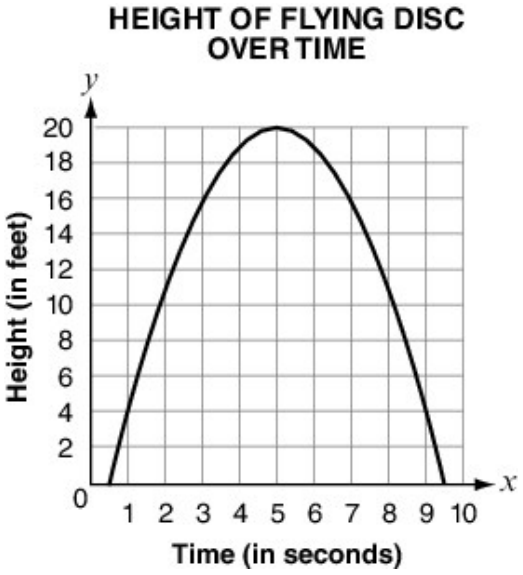
C.



D.



56. A flying disc is thrown up in the air. The graph below shows its height after *t* seconds.



Which of these statements is true?

A. The disc reaches its minimum height of 5 feet at 20 seconds.

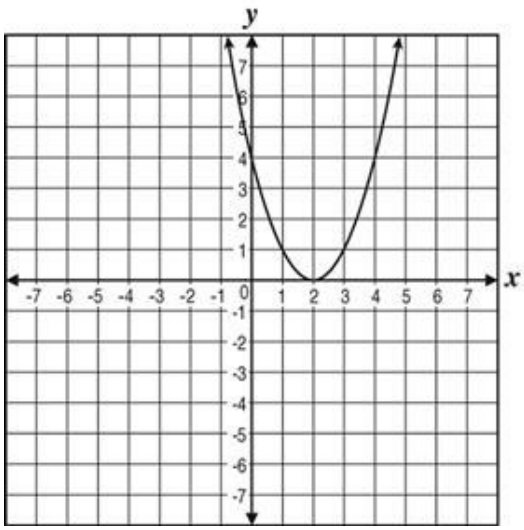
B. The disc reaches its maximum height of 5 feet at 20 seconds.

C. The disc reaches its minimum height of 20 feet at 5 seconds.

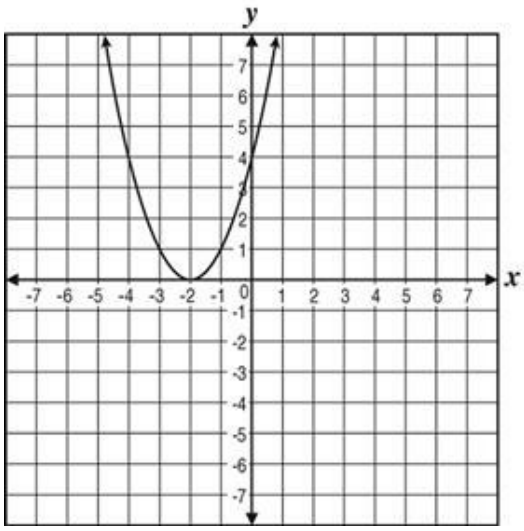
D. The disc reaches its maximum height of 20 feet at 5 seconds.

57. **Which graph represents the quadratic function** $y = x^2 + 2$?

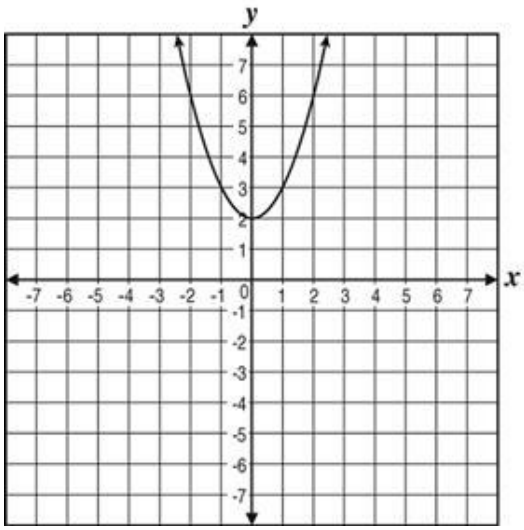
A.



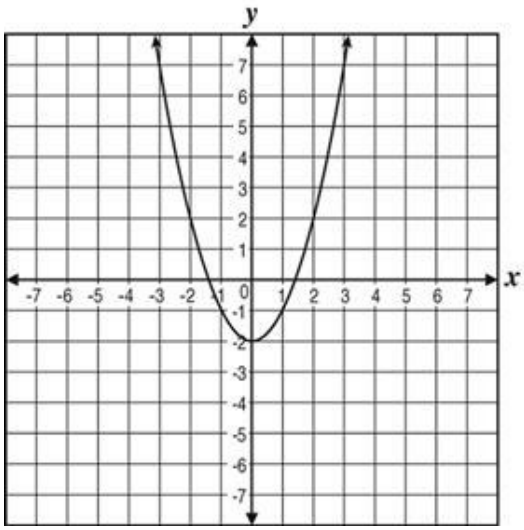
B.



C.

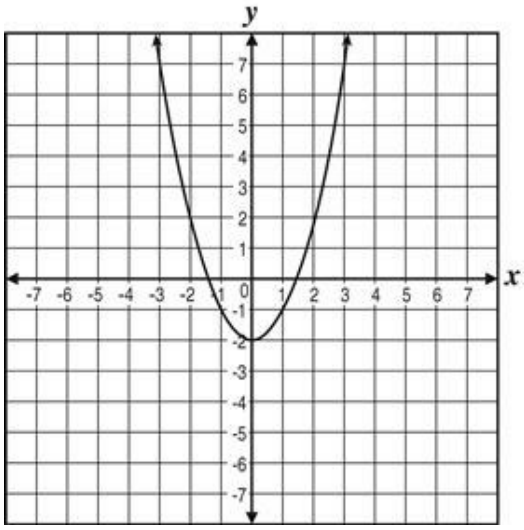


D.

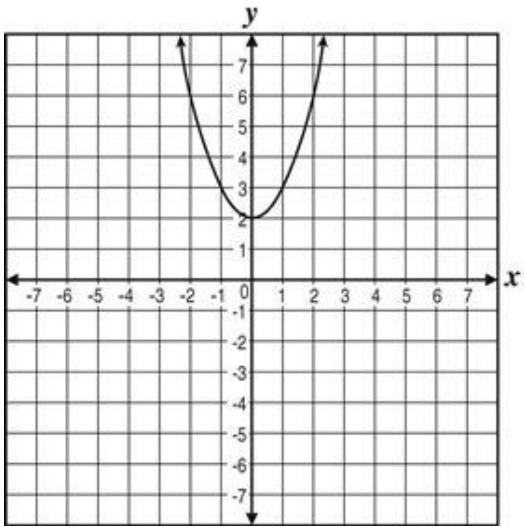


58. **Which of the following graphs represents the quadratic function** $y = (x-2)^2$?

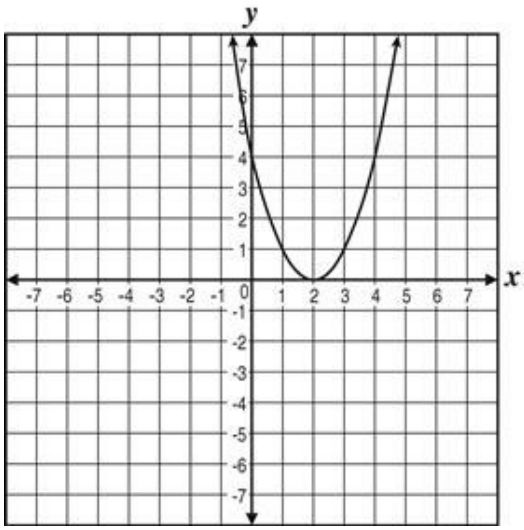
A.



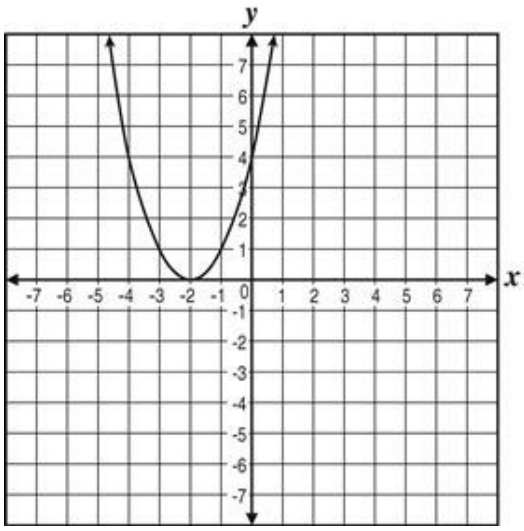
B.



C.

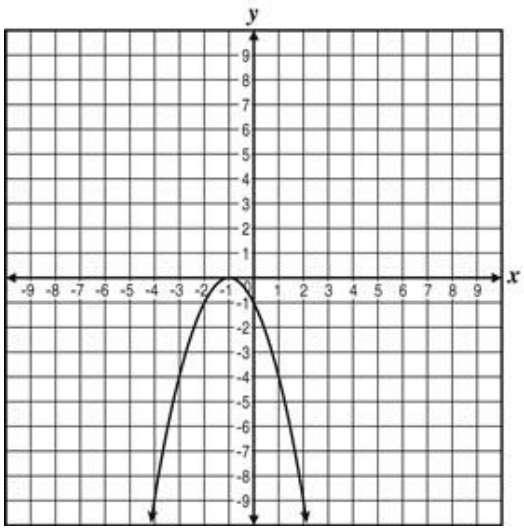


D.

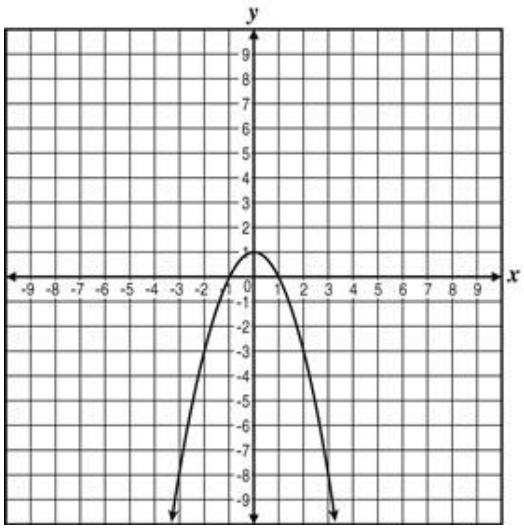


59. **Which graph describes** $f(x) = -x^2 + 2x - 1$?

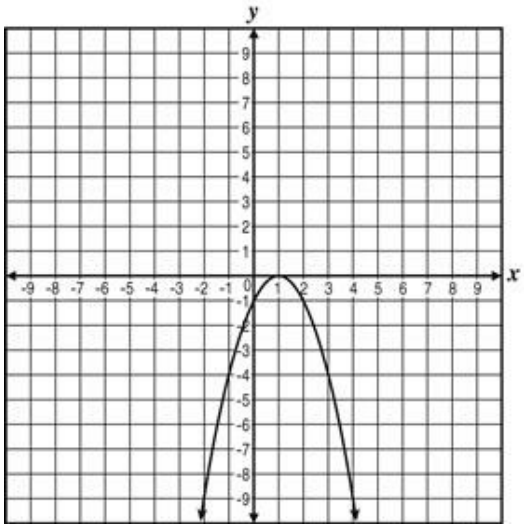
A.



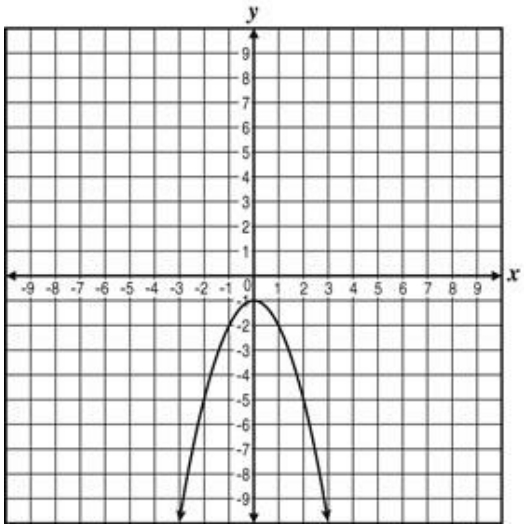
B.



C.

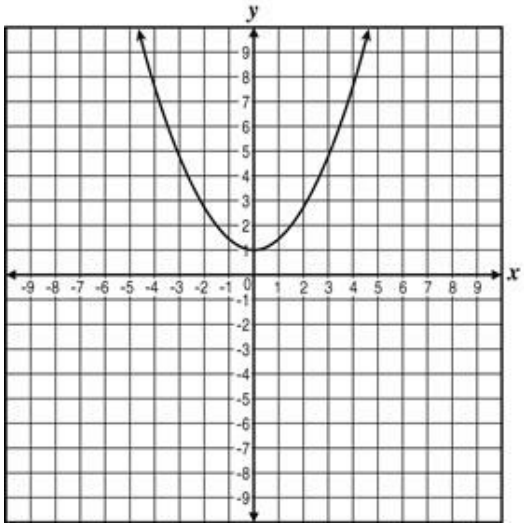


D.

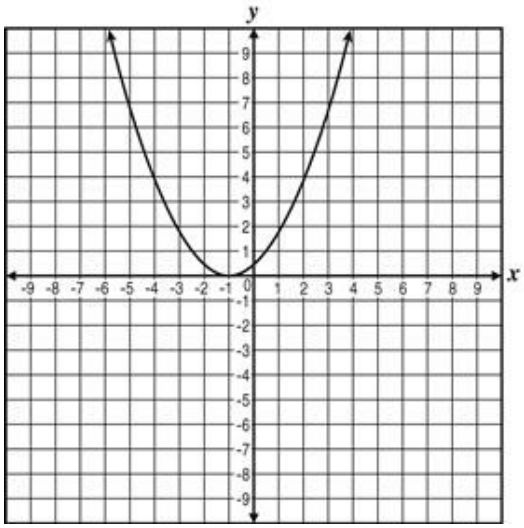


60. **Which graph describes** $f(x) = 3x^2 - 6x - 4$?

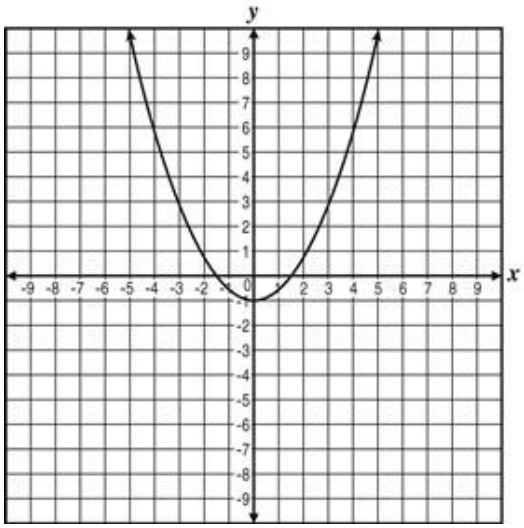
A.



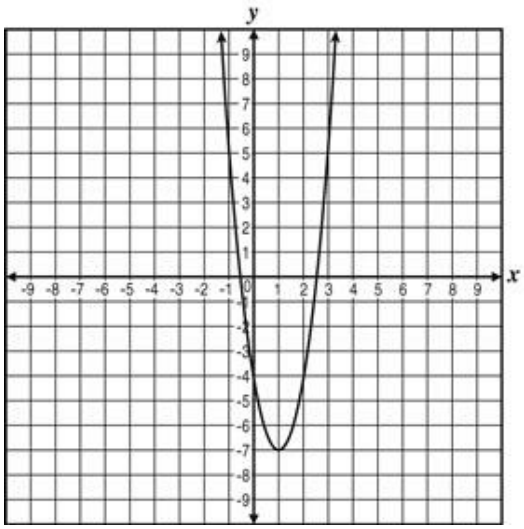
B.



C.

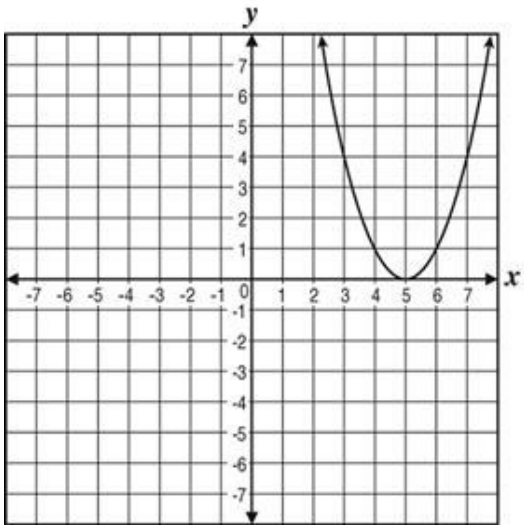


D.

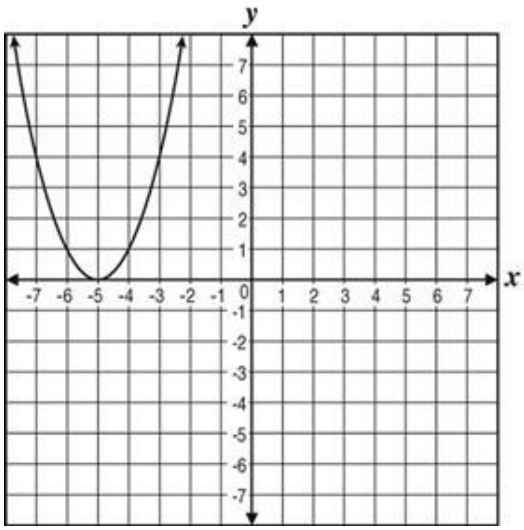


61. **Which graph represents the quadratic function** $y = (x - 5)^2$?

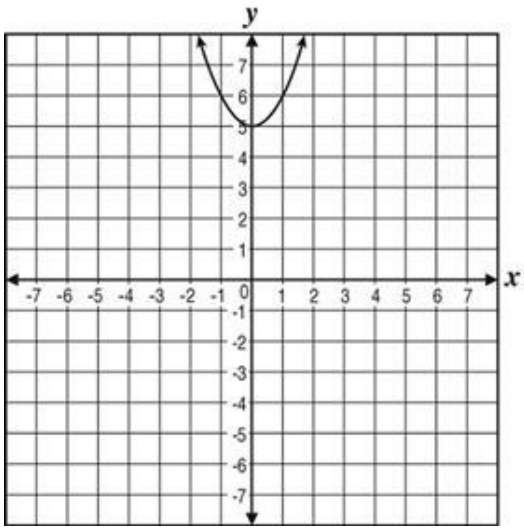
A.



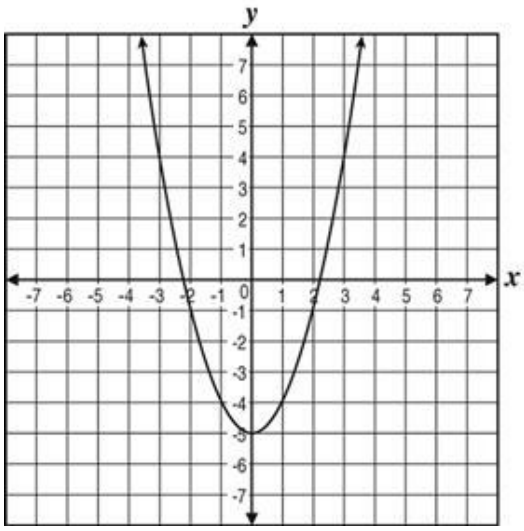
B.



C.

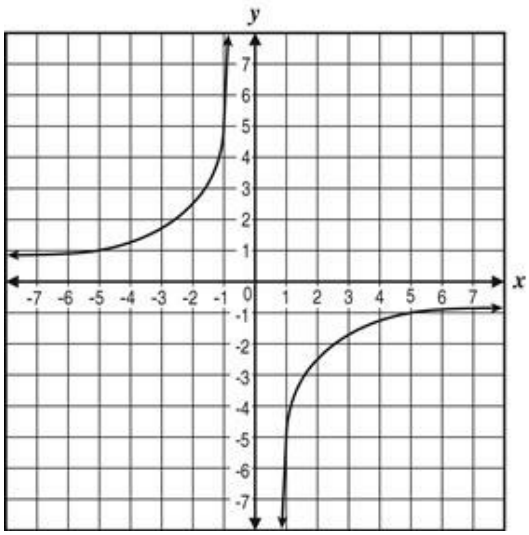


D.

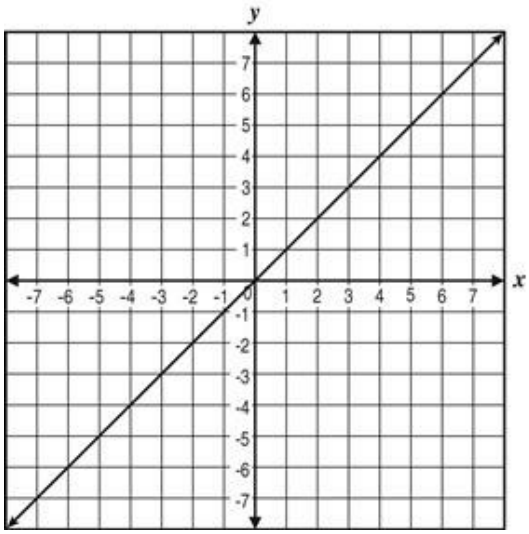


62. **Which graph represents the equation** $y = x^2$?

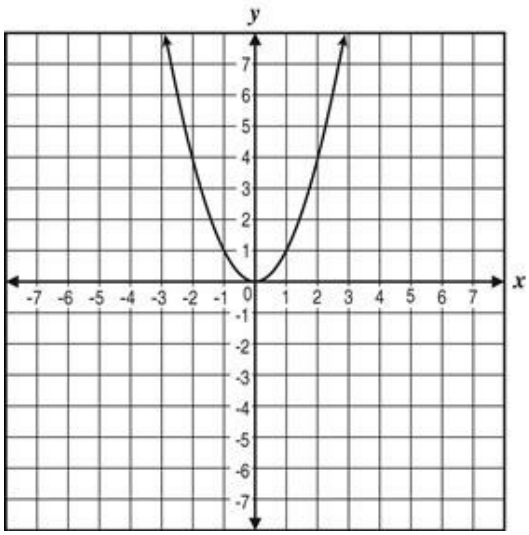
A.



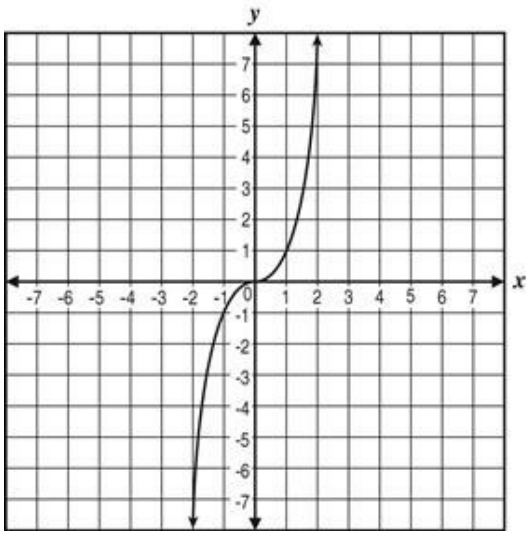
B.



C.

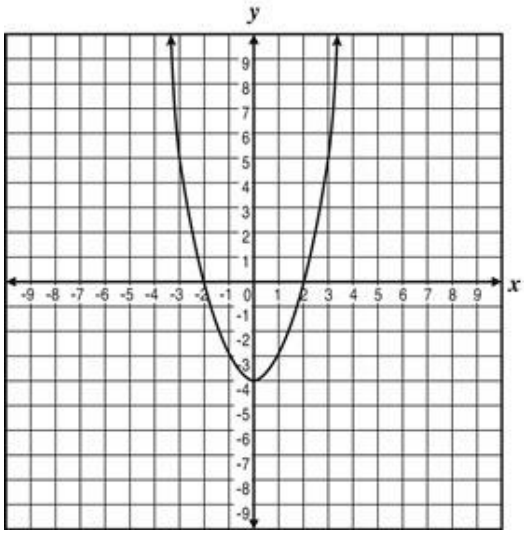


D.

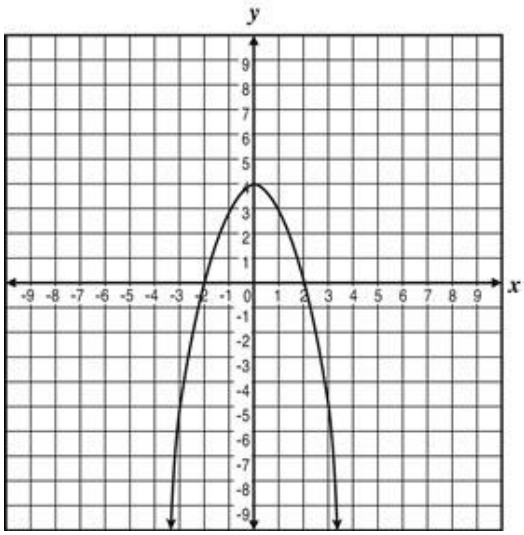


63. **Which of these graphs has roots of – 2 and 2 and a minimum of – 4?**

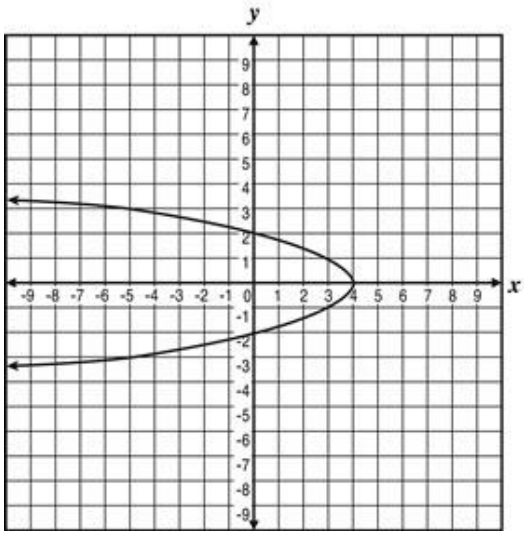
A.



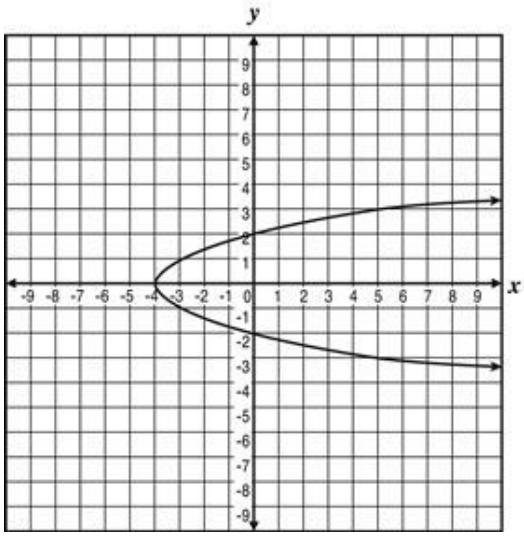
B.



C.

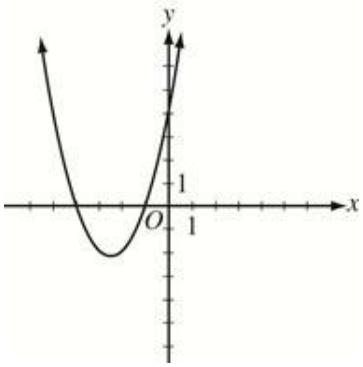


D.

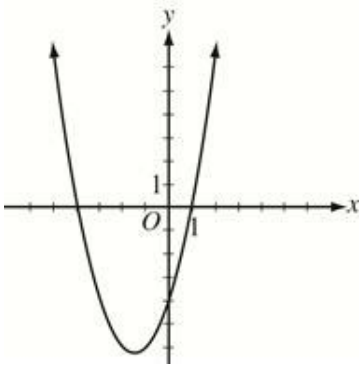


64. **Which of the following is the graph of the function** $y = (x - 1)(x - 4)$?

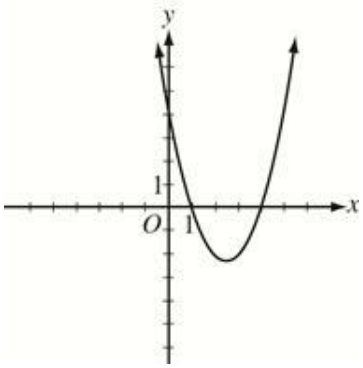
A.



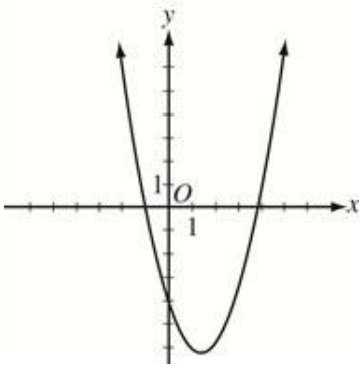
B.



C.



D.



65. **Which quadratic equation has a graph with a minimum at (–2, 5)?**

A. $y = x^2 - 4x + 9$

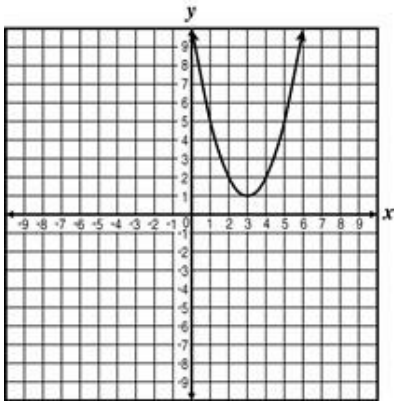
B. $y = x^2 + 4x + 9$

C. $y = x^2 + 3$

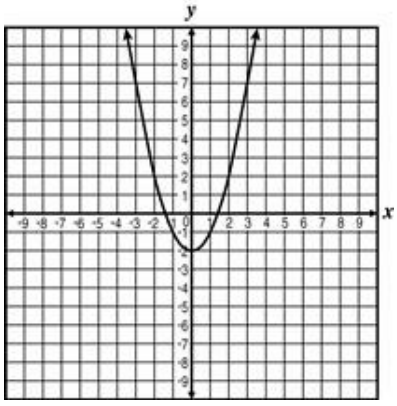
D. $y = x^2 + 5$

66. **Which graph best represents the equation** $y = (x - 3)^2 + 1$?

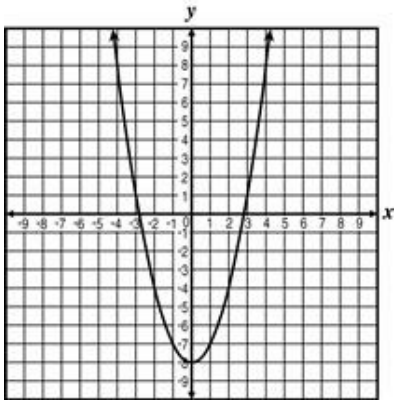
A.



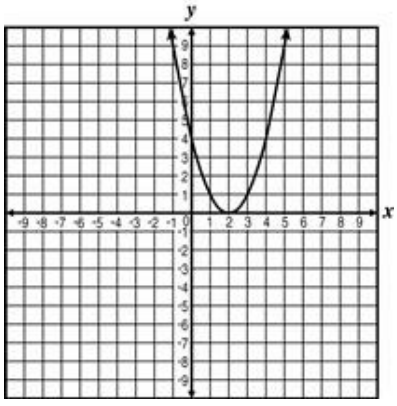
B.



C.

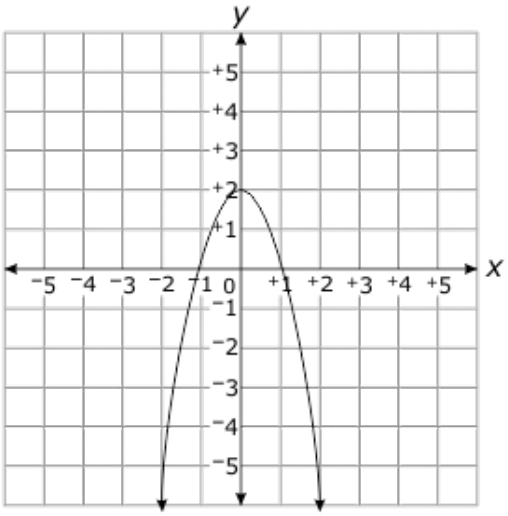


D.

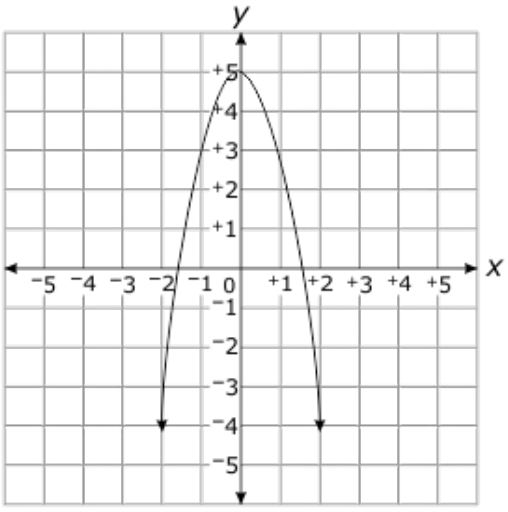


67. Which choice is the graph of $f(x) = -x^2 + 2x + 4$?

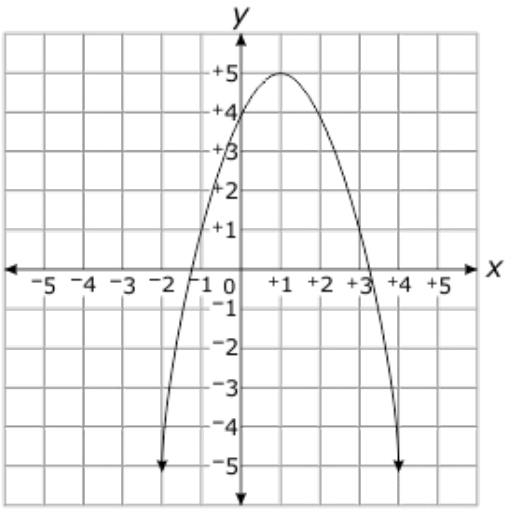
A.


y
x
+5
+4
+3
+2
+1
−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5
−1
−2
−3
−4
−5

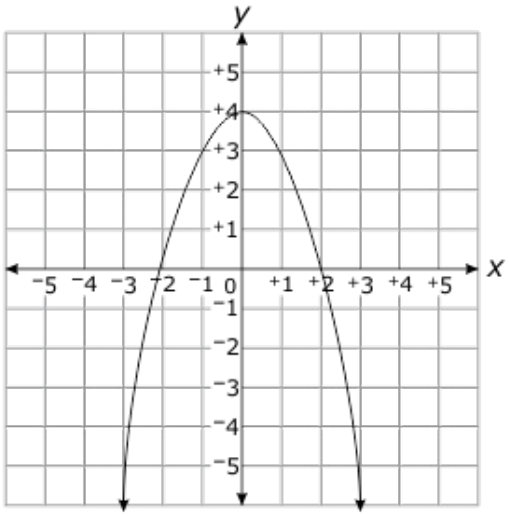
B.


y
x
+5
+4
+3
+2
+1
−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5
−1
−2
−3
−4
−5

C.

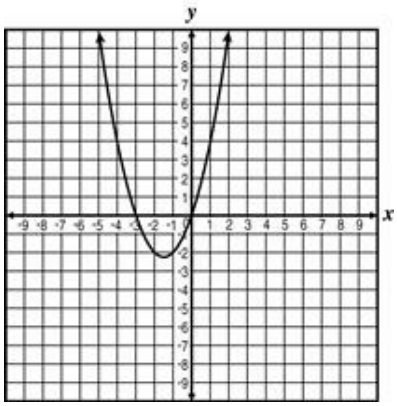

y
x
+5
+4
+3
+2
+1
−5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5
−1
−2
−3
−4
−5

D.

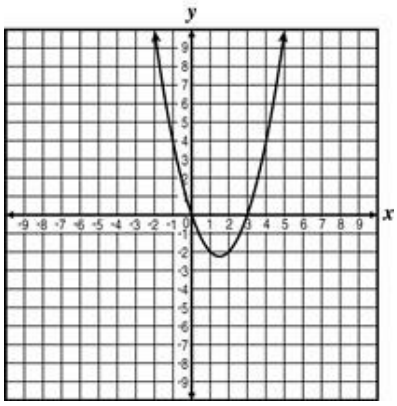


68. **Which graph best represents** $y = x^2 - 3x$?

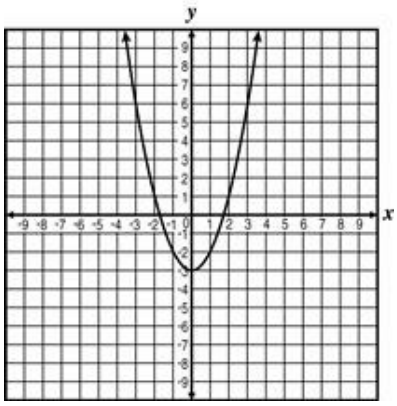
A.



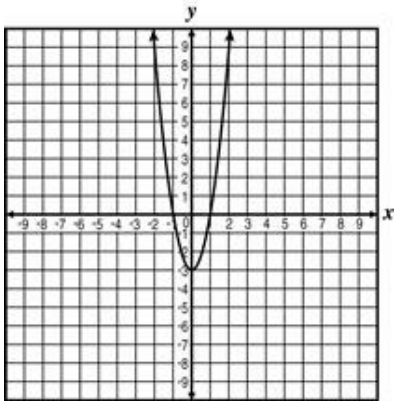
B.



C.



D.



69. **What are the coordinates of the vertex of the parabola** $y = x^2 + 4x - 6$?

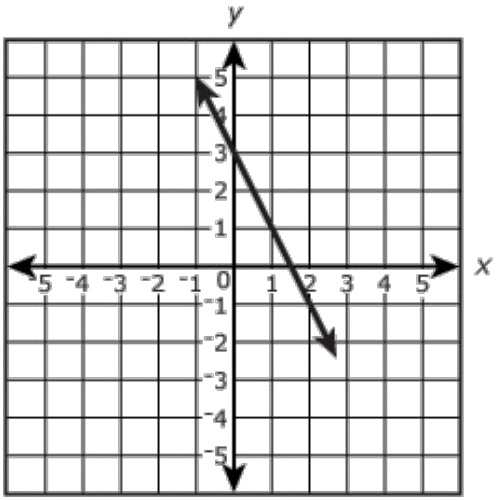
A. $(-4, 6)$

B. $(-2, -10)$

C. $(2, 6)$

D. $(4, -6)$

70. The graph of a function is shown.



What is the *y*-intercept?

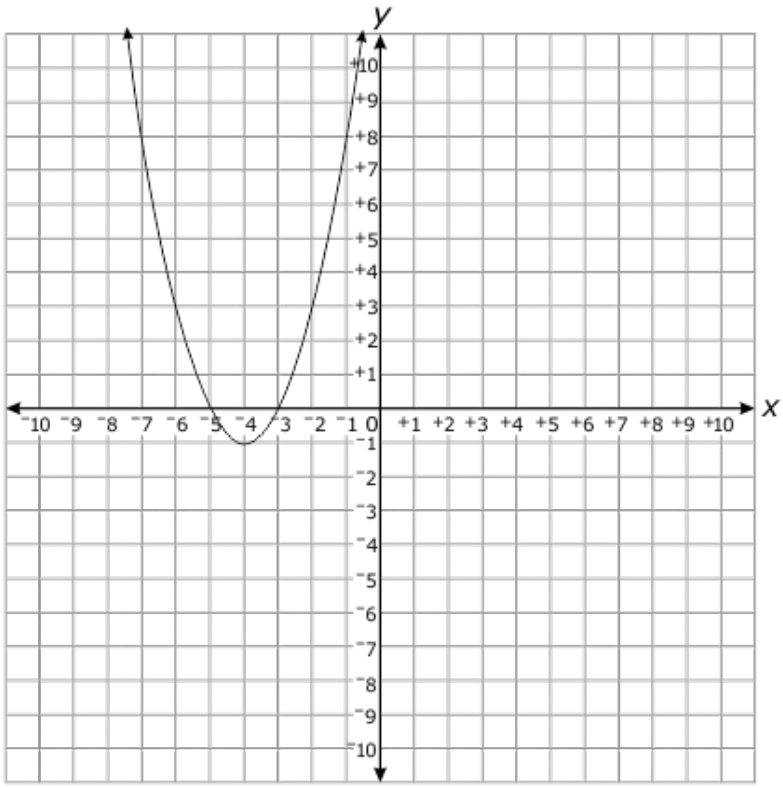
A. -3

B. -2

C. 2

D. 3

71. Which is an equation of the function graphed below?



A. $y = -x^2 + 8x + 15$

B. $y = -x^2 + 8x - 15$

C. $y = x^2 + 8x - 15$

D. $y = x^2 + 8x + 15$

72. During a physics experiment, a ball is tossed and its height in feet, y, after x seconds is recorded. In the graph created from these data, the function is parabolic in shape and has a *y*-intercept at $x = 5$, an *x*-intercept at $y = 2.1$, and a vertex at $(1, 21)$. Which statement is true of the ball in this experiment?

A. The ball is in the air for about 5 seconds.

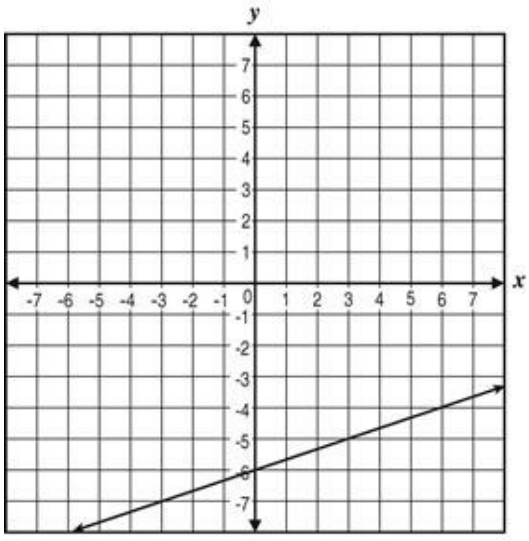
B. The ball is thrown from a height of about 2.1 feet.

C. The ball reaches a minimum height of about 21 feet.

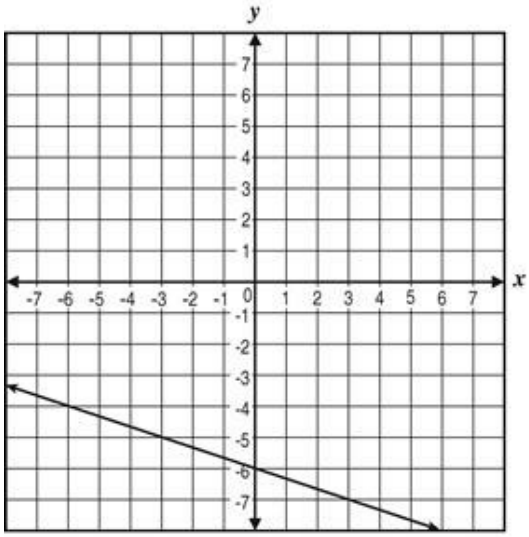
D. The ball reaches a maximum height after about 1 second.

73. **Which graph represents** $x + 3y = -6$?

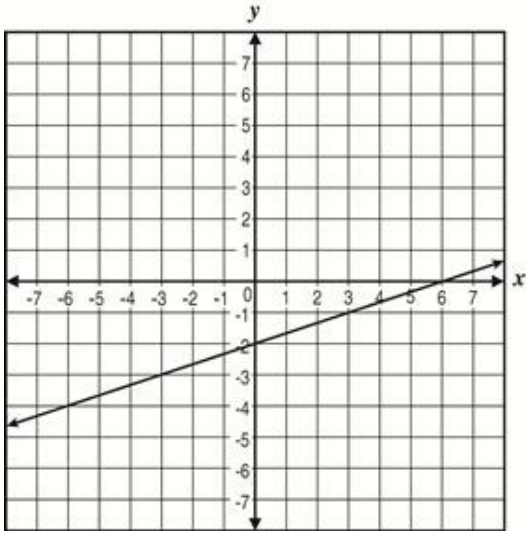
A.



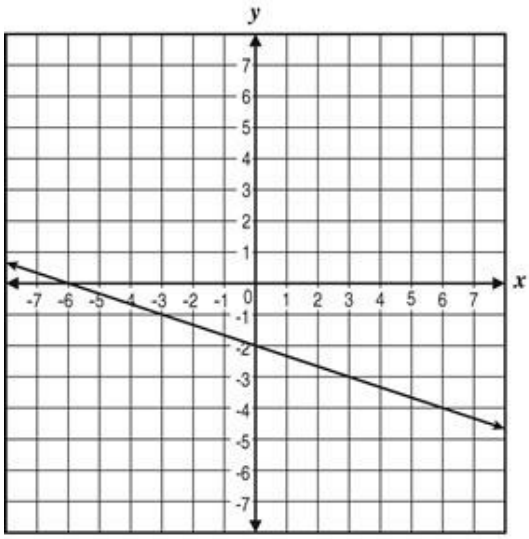
B.



C.

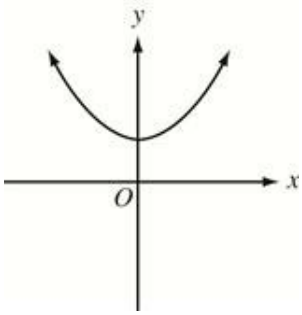


D.

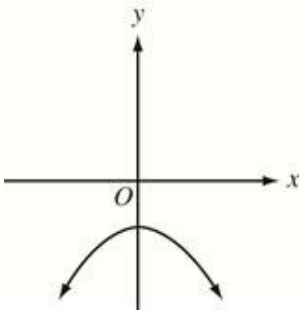


74. **Which of the following could be the graph of** $y = ax^2 + c$ **if** $a > 0$ **and** $c > 0$?

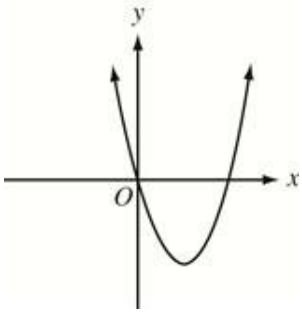
A.



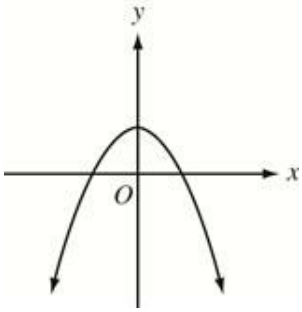
B.



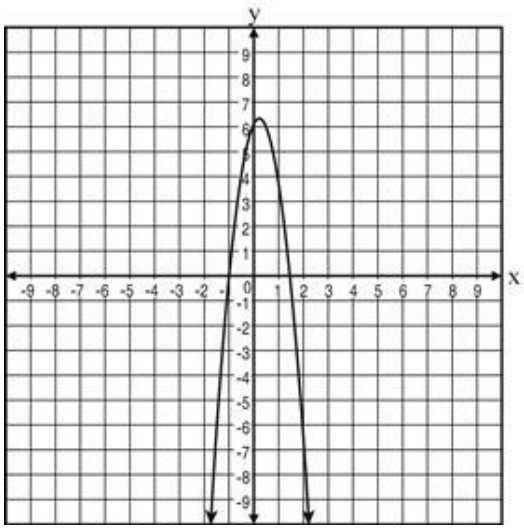
C.



D.



75. **Which quadratic function *f* (*x*) is best represented by this graph?**



A. $f(x) = -4(x - 1)(2x + 3)$

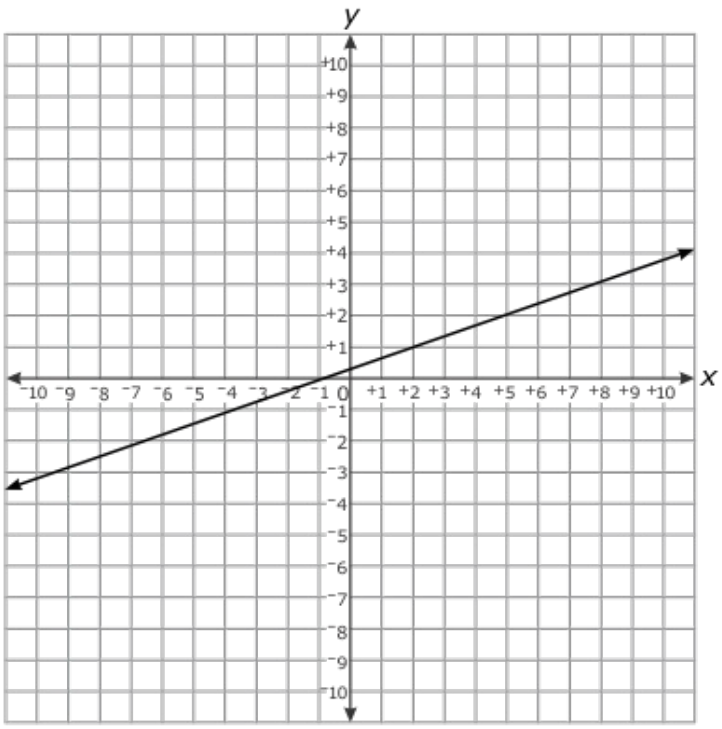
B. $f(x) = -3(x + 1)(3x - 2)$

C. $f(x) = -2(x + 1)(2x - 3)$

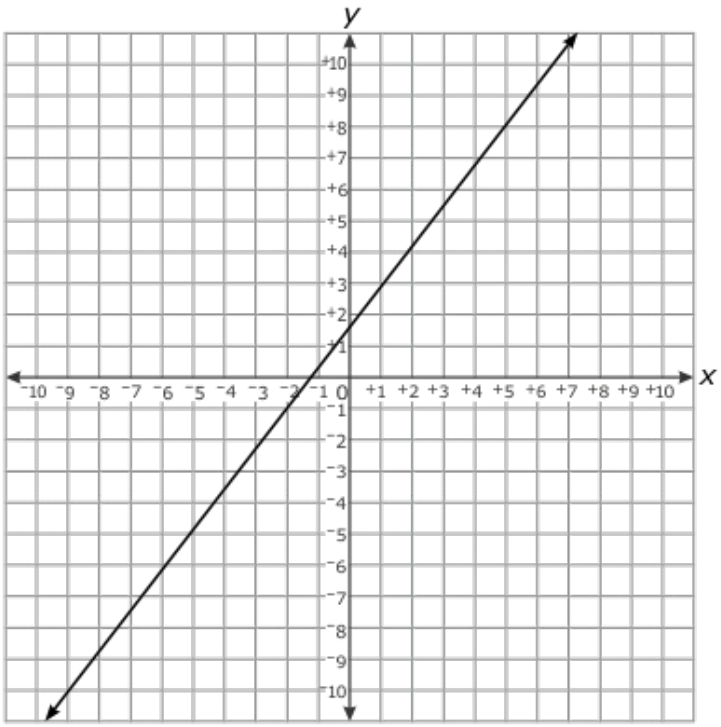
D. $f(x) = -6(x - 1)(2x - 3)$

76. Which choice is the graph of $\frac{2}{3}x + \frac{1}{2}y = \frac{3}{4}$?

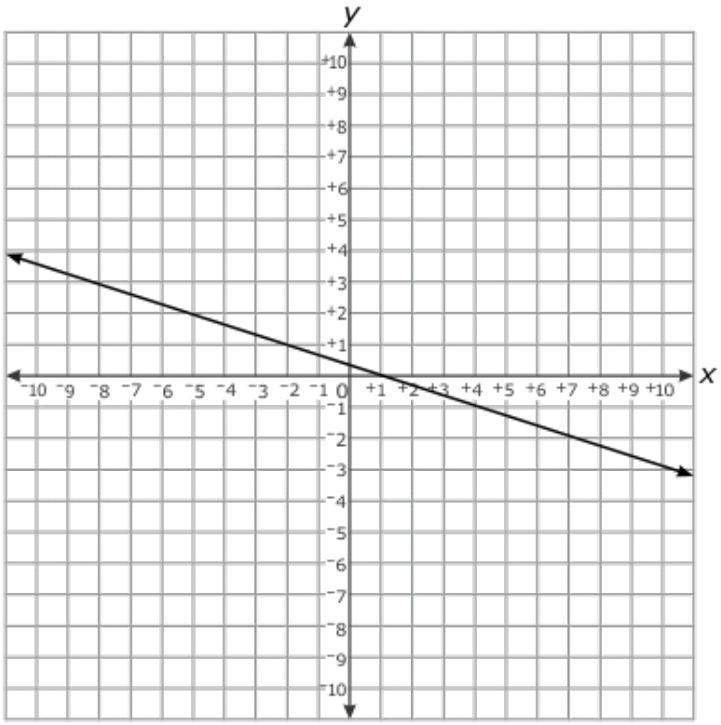
A.



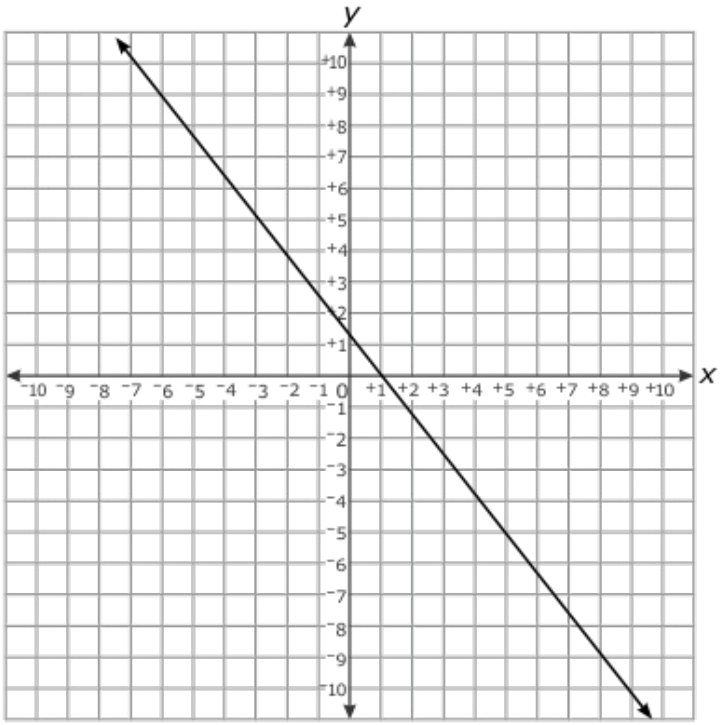
B.



C.

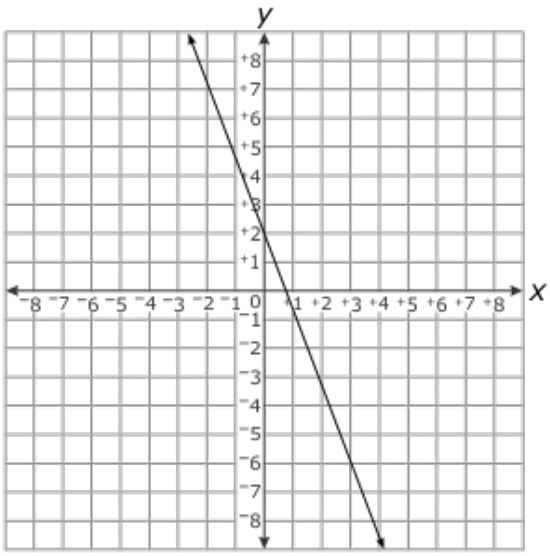


D.

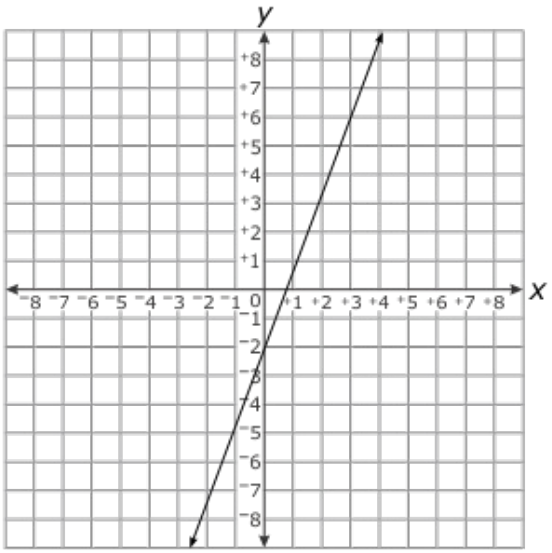


77. Which is the graph of $\frac{2}{3}x - \frac{1}{4}y = \frac{1}{2}$?

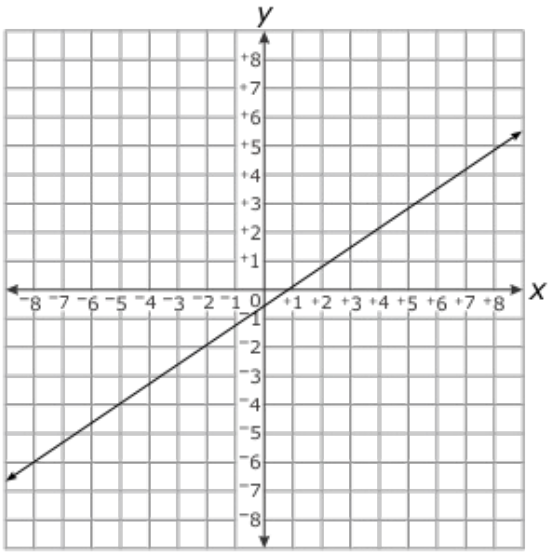
A.



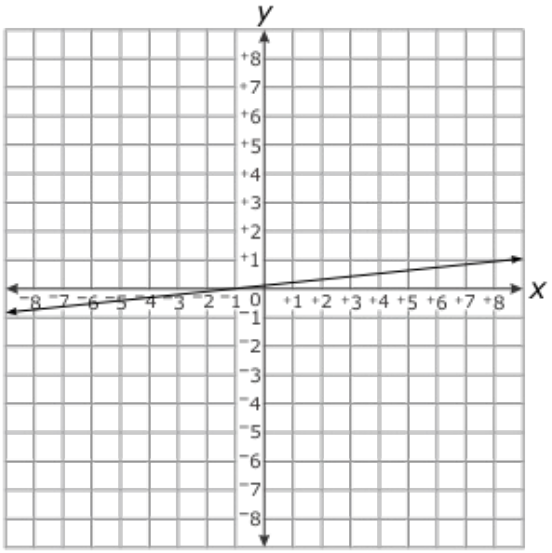
B.



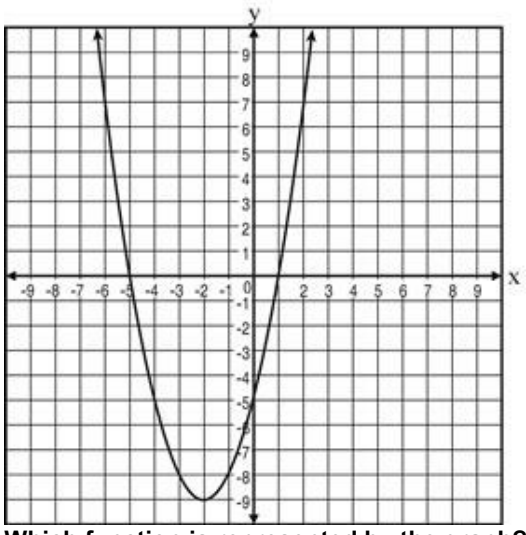
C.



D.



78. **This is a graph of a quadratic function.**



Which function is represented by the graph?

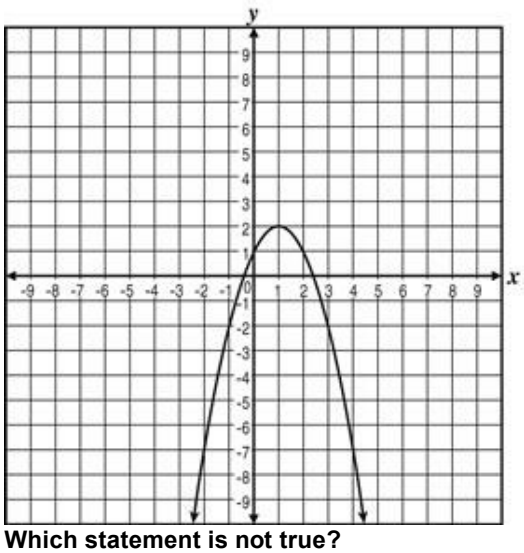
A. $f(x) = x^2 - 4x + 5$

B. $f(x) = x^2 - 4x - 5$

C. $f(x) = x^2 + 4x - 5$

D. $f(x) = x^2 + 4x + 5$

79. **The graph below represents the function** $f(x) = -x^2 + 2x + 1$.



Which statement is not true?

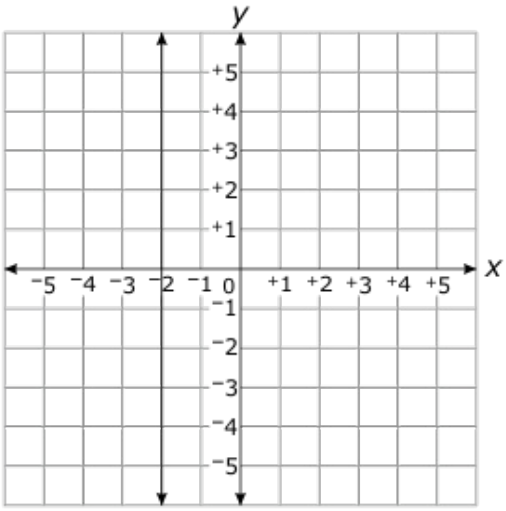
A. The function has two *x*-intercepts.

B. The function has two *y*-intercepts.

C. The function has a maximum value at (1, 2).

D. The function has a line of symmetry at $x = 1$.

80. Which is an equation of the line graphed below?



A. $y = {}^{-}2$

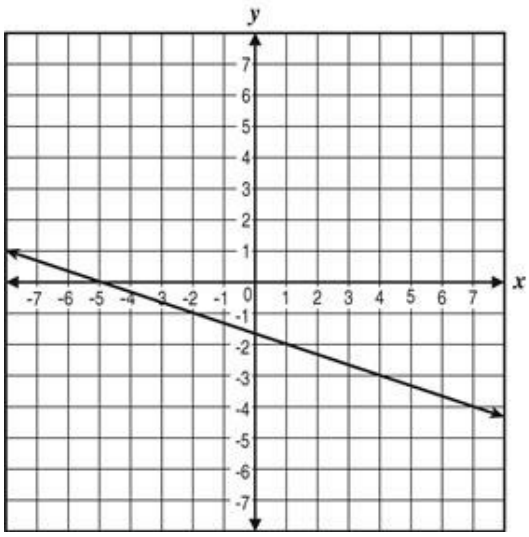
B. $y = {}^{-}2x$

C. $x = {}^{-}2$

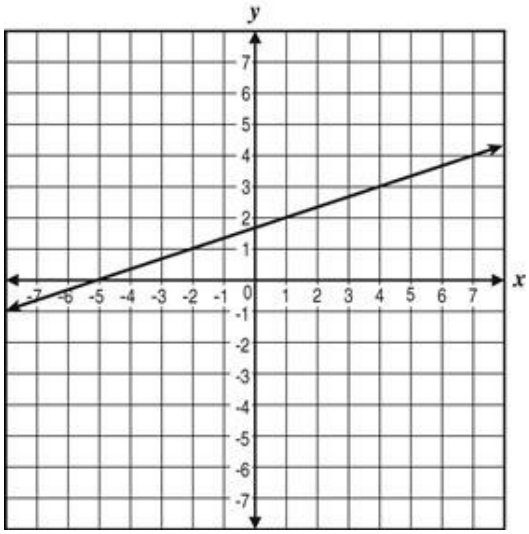
D. $x = {}^{-}2y$

81. **Which graph represents** $x - 3y = 5$?

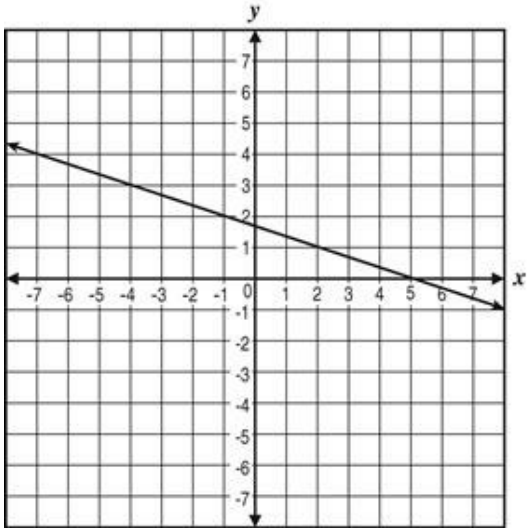
A.



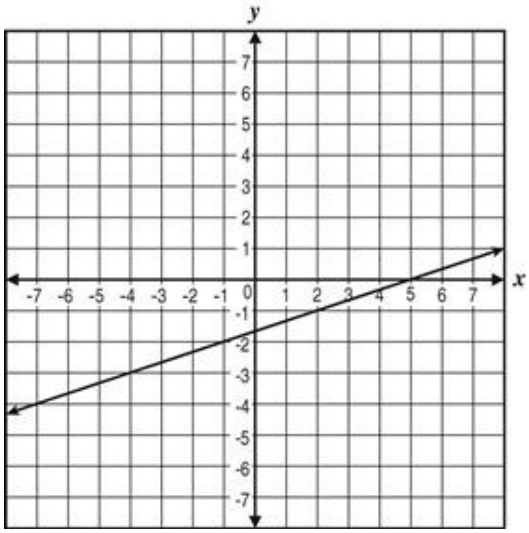
B.



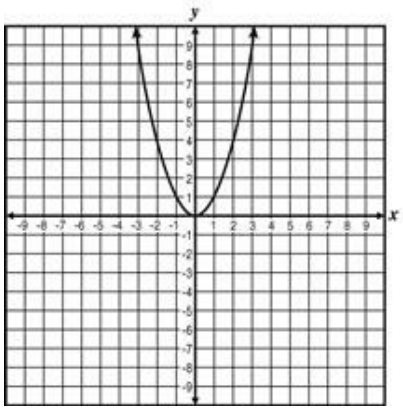
C.



D.



82. **What is the equation of the algebraic function that is shown in the graph?**



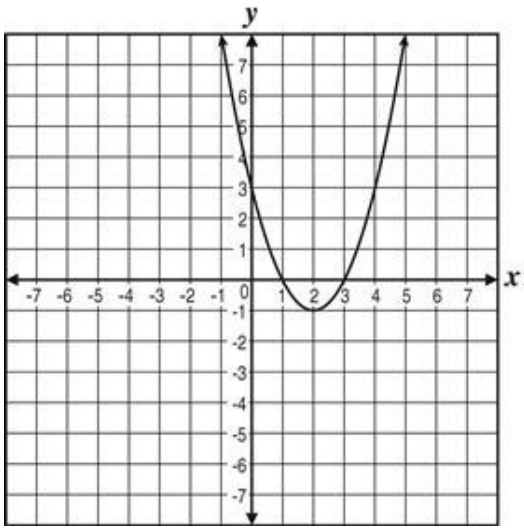
A. $f(x) = |x|$

B. $f(x) = x^2$

C. $f(x) = x^3$

D. $f(x) = \sqrt{x}$

83. **The graph of $y = x^2 - 4x + 3$ is shown below.**



Based on this graph, which point is a root of the equation $x^2 - 4x + 3 = 0$?

A. $(0, 3)$

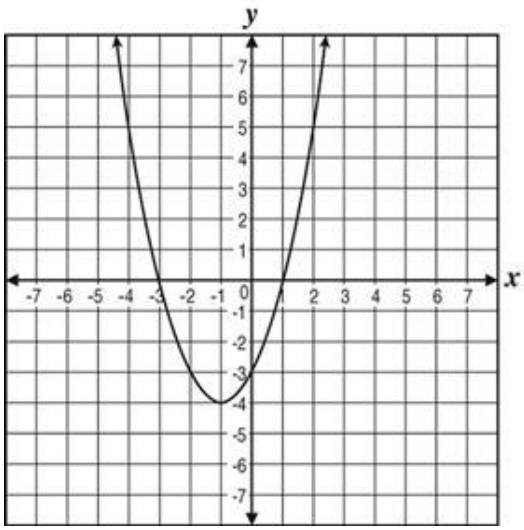
B. $(1, 0)$

C. $(2, -1)$

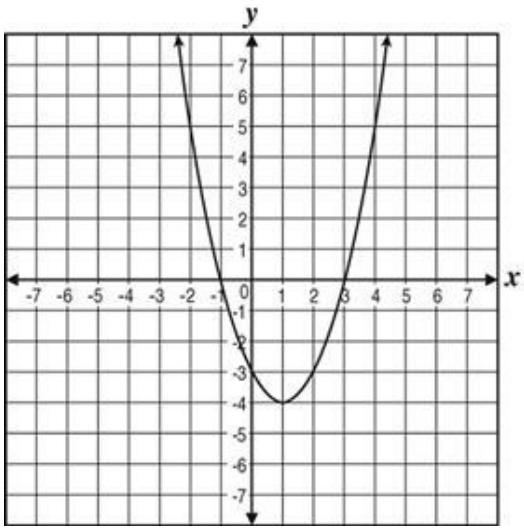
D. $(4, 3)$

84. **The roots of the quadratic equation $x^2 - 2x - 3 = 0$ can be found by using which of the following parabolas?**

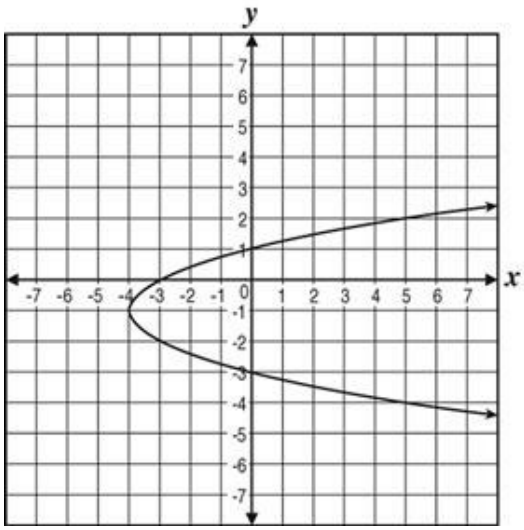
A.



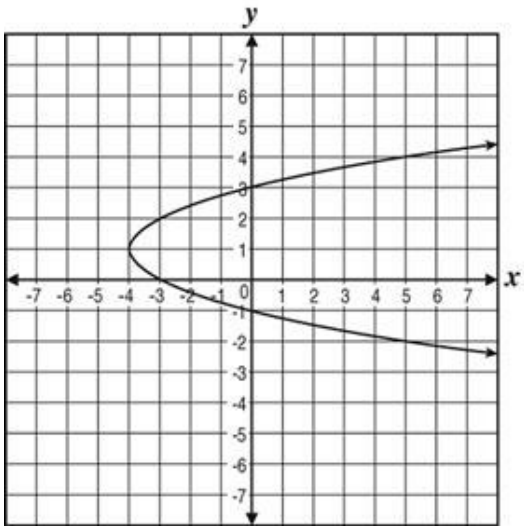
B.



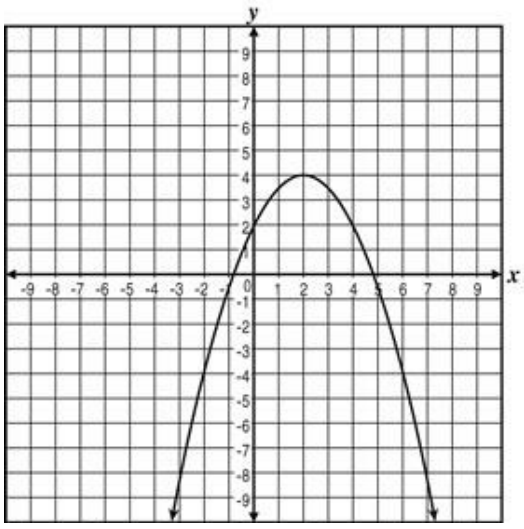
C.



D.



85. **The graph below represents the function** $f(x) = -\frac{x^2}{2} + 2x + 2$.

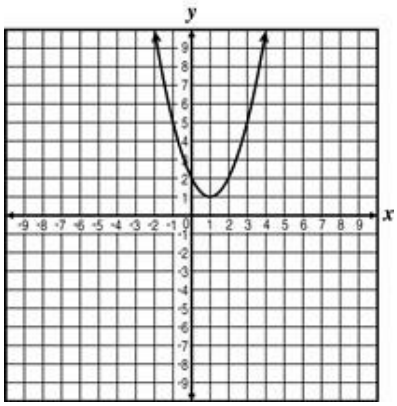


Which statement is true?

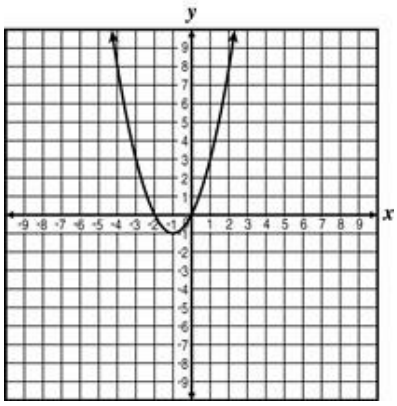
A. The maximum point is (2, 4).
B. The maximum point is (4, 2).
C. The minimum point is (4, 2).
D. The minimum point is (2, 4).

86. **Which graph best represents** $y = (x - 1)^2 + 1$?

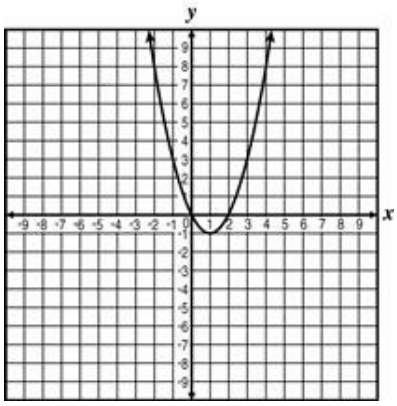
A.



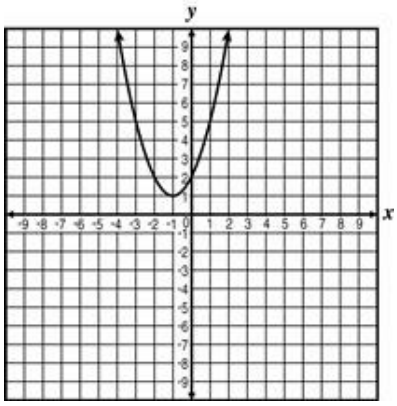
B.



C.



D.



87. A punter kicks a football into the air during practice. The graph below shows the function that represents the height of the football with respect to time.

What is the maximum height the football reaches after being kicked?

A. 1.5 meters

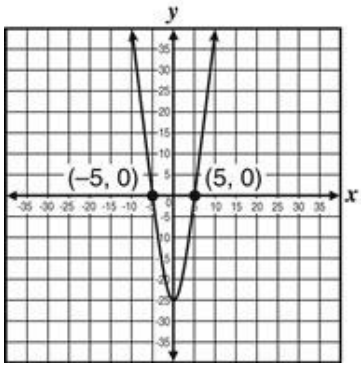
B. 3 meters

C. 3.5 meters

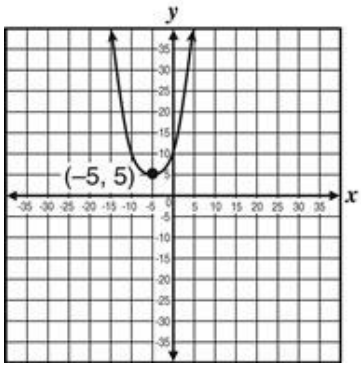
D. 7 meters

88. **Which graph shows the solution for $y = x^2 - 25$ when $y = 0$?**

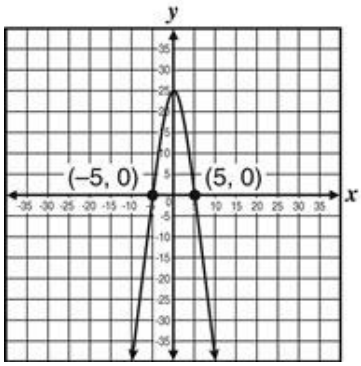
A.



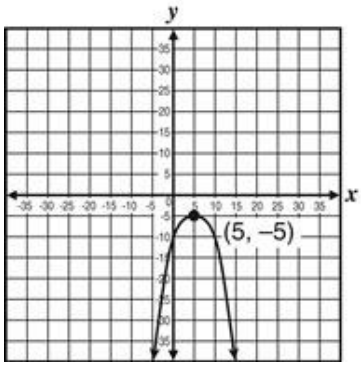
B.



C.

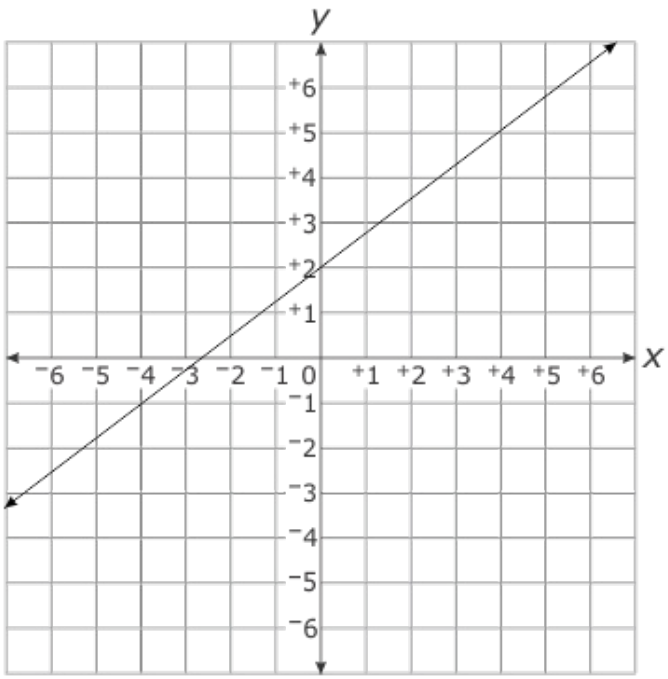


D.

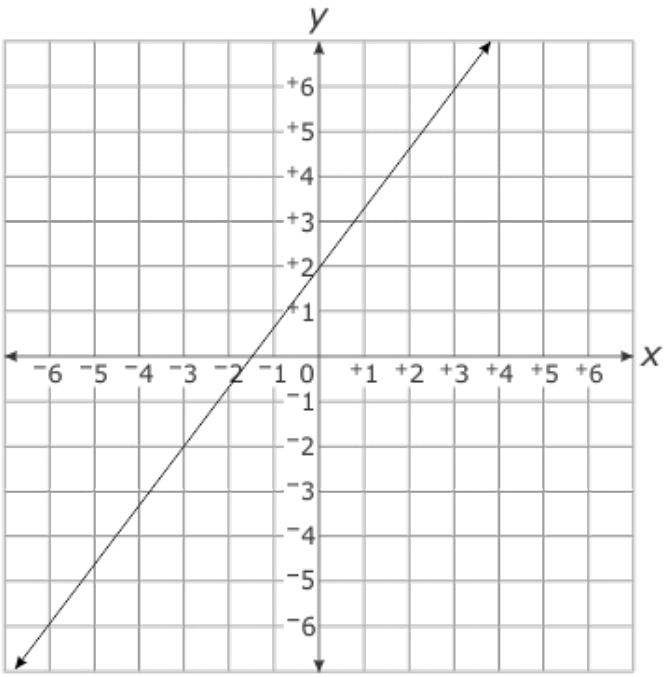


89. Which is the graph of $3x + 4y = 8$?

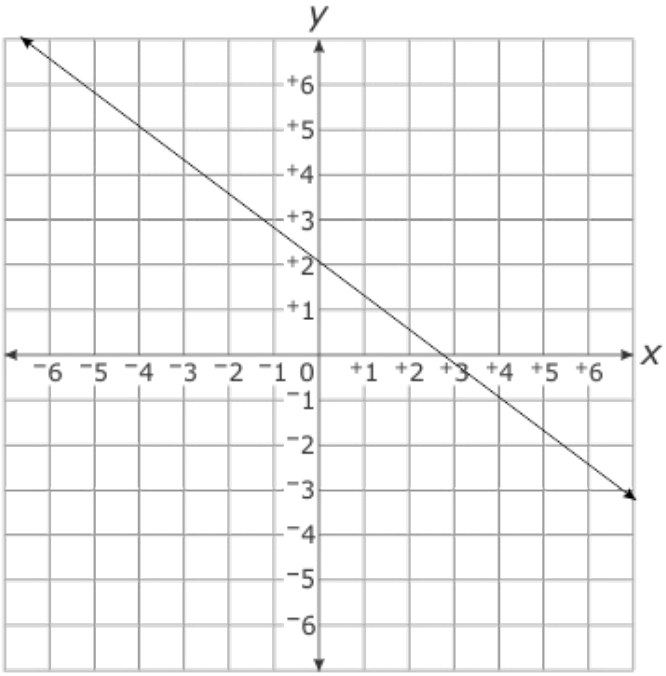
A.


y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

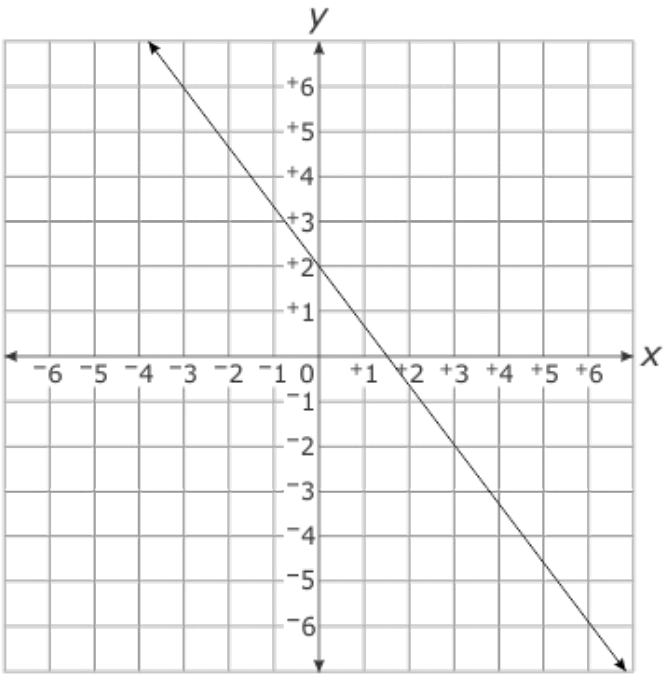
B.


y
x
+6
+5
+4
+3
+2
+1
−6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6
−1
−2
−3
−4
−5
−6

C.

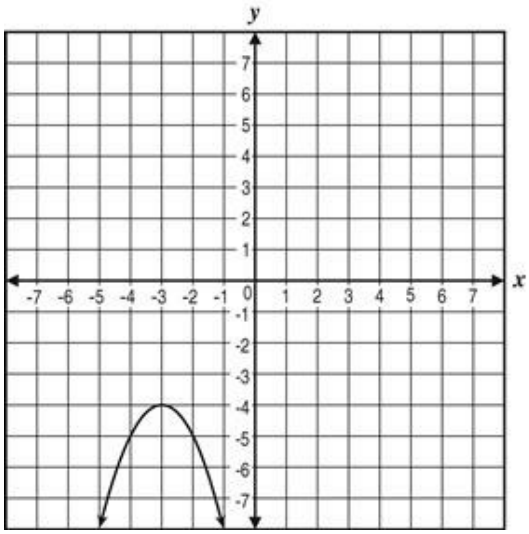


D.

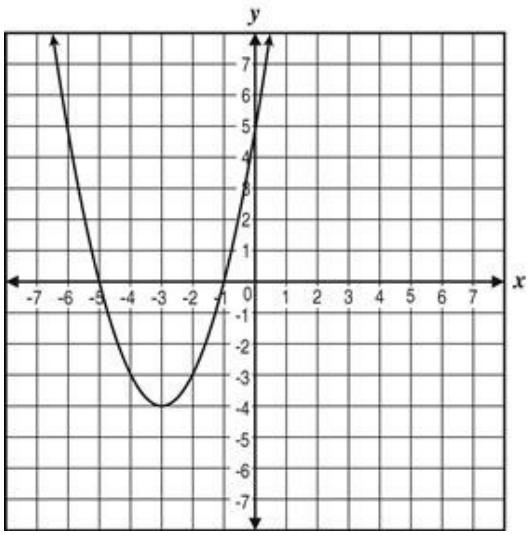


90. **Which graph below represents the equation** $y = x^2 + 6x + 5$**?**

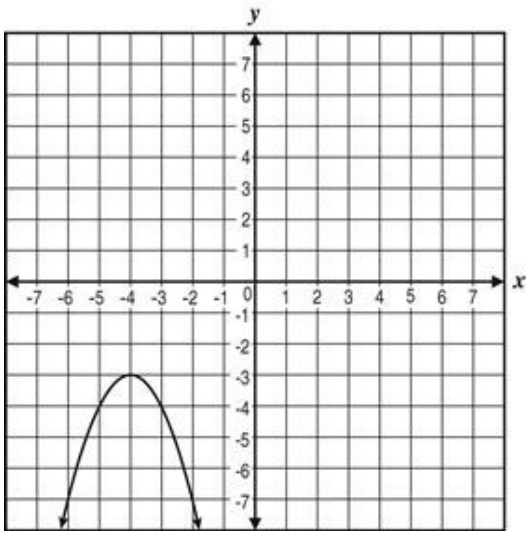
A.



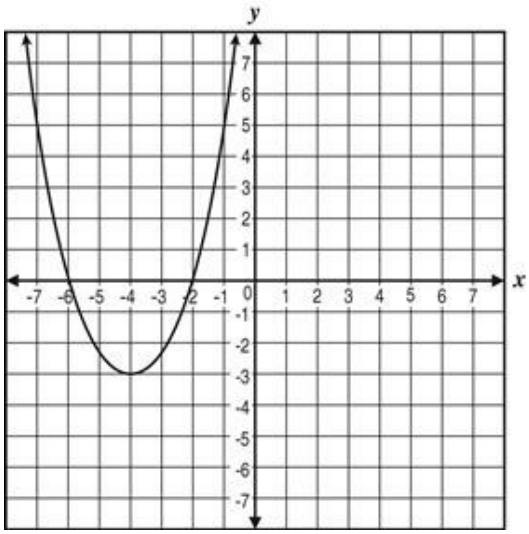
B.



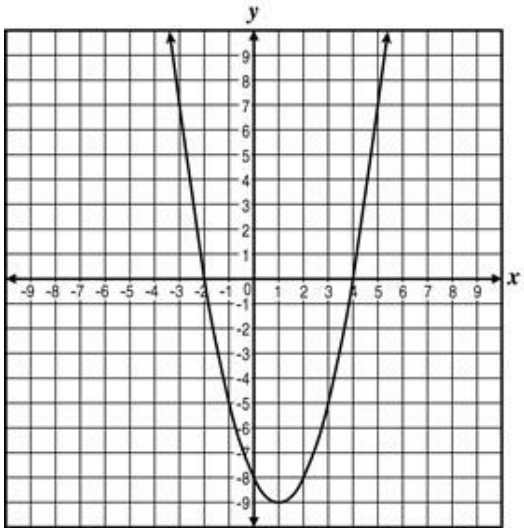
C.



D.



91. **Which table of coordinates is best represented by the graph below?**



A.

x	y
–2	0
0	–8
2	–8
4	0
5	7

B.

x	y
–3	7
–2	0
0	–8
4	0
5	5

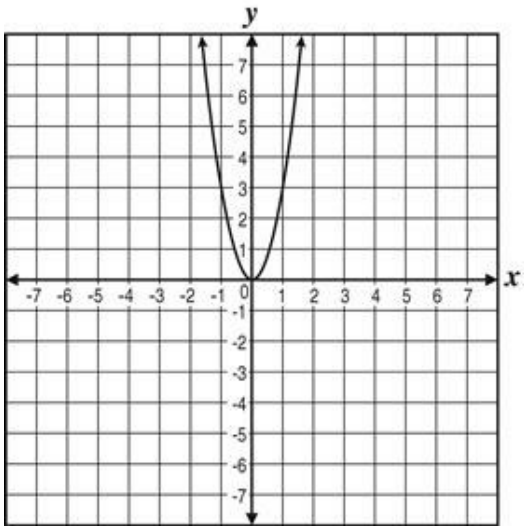
C.

x	y
–2	0
0	–8
1	–9
4	1
5	7

D.

x	y
–3	7
0	–2
1	–9
0	4
3	–5

92. **Which of the following functions does the graph represent?**



A. $y = 3x$

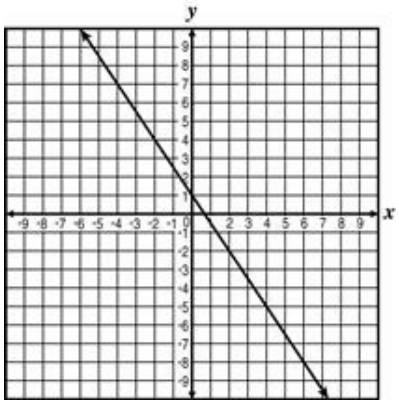
B. $y = 3x^2$

C. $y = 3x^3$

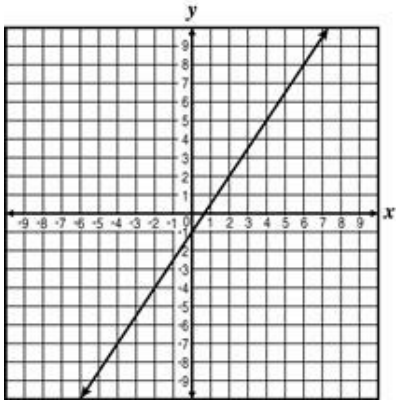
D. $y = 3\,|x|$

93. **Which graph represents** $-3x + 2y + 2 = 0$?

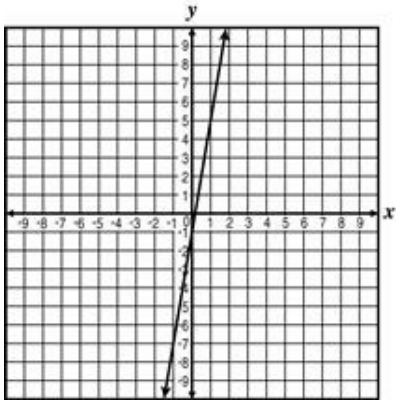
A.



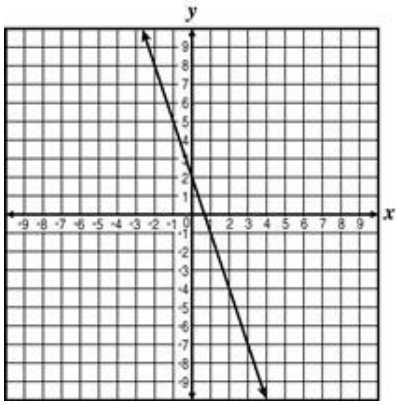
B.



C.

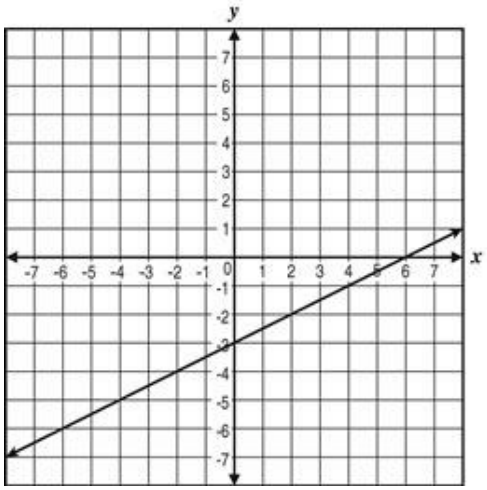


D.

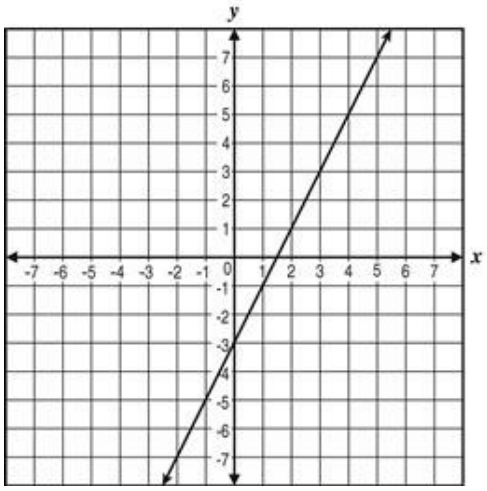


94. **Which graph represents $x - 2y = 6$?**

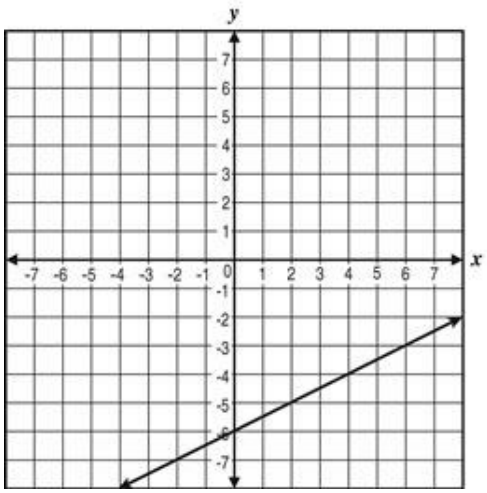
A.



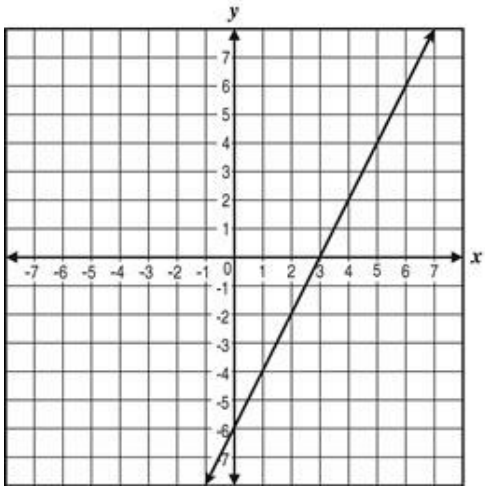
B.



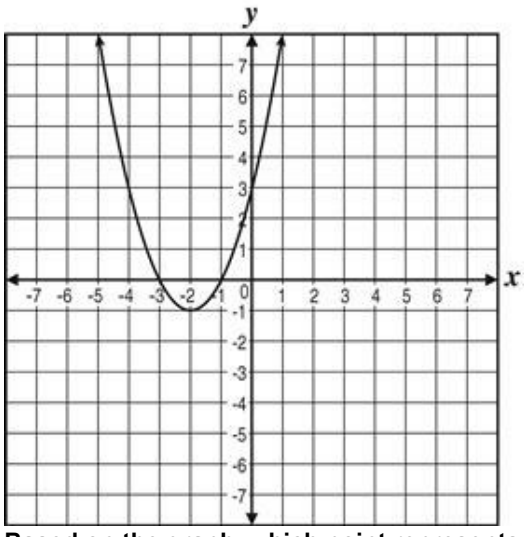
C.



D.



95. **The graph of $y = x^2 + 4x + 3$ is shown below.**



Based on the graph, which point represents a root of the equation $x^2 + 4x + 3 = 0$?

A. $(0, 3)$

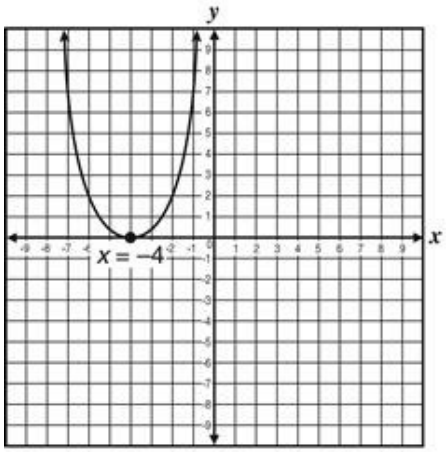
B. $(-1, 0)$

C. $(-2, 1)$

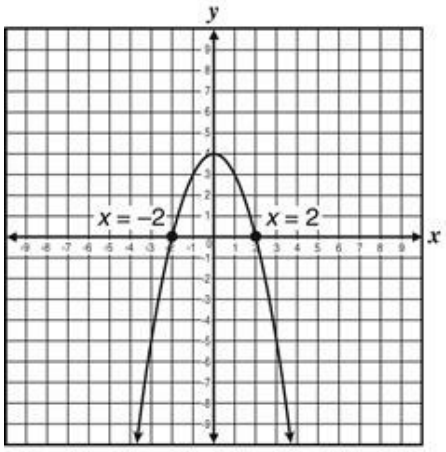
D. $(-4, 3)$

96. **Which graph shows the solution for $y = 4 - x^2$ when $y = 0$?**

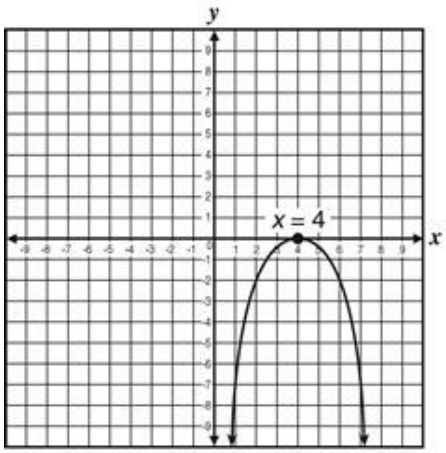
A.



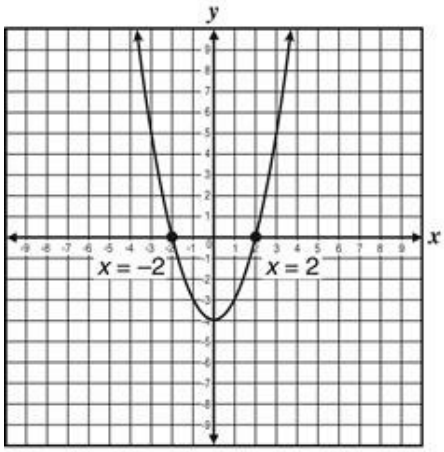
B.



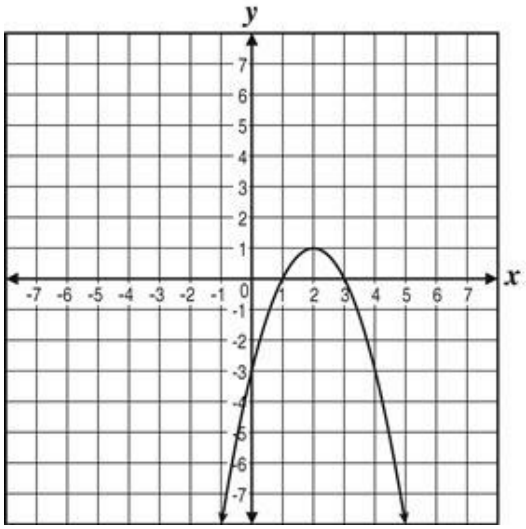
C.



D.



97. **The graph of $y = -x^2 + 4x - 3$ is shown.**

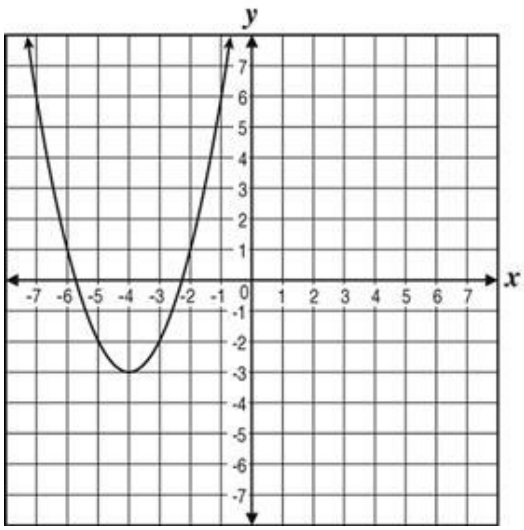


Based on this graph, which point is a root of the equation $y = -x^2 + 4x - 3$?

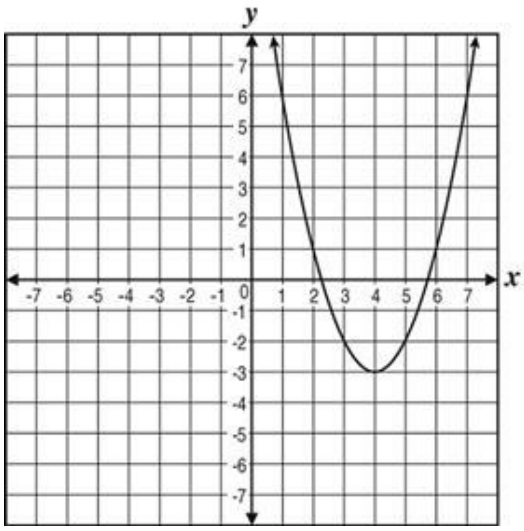
A. $(0, -3)$
B. $(2, 1)$
C. $(3, 0)$
D. $(5, -8)$

98. **Which graph represents the quadratic function $y = (x - 3)^2 - 4$?**

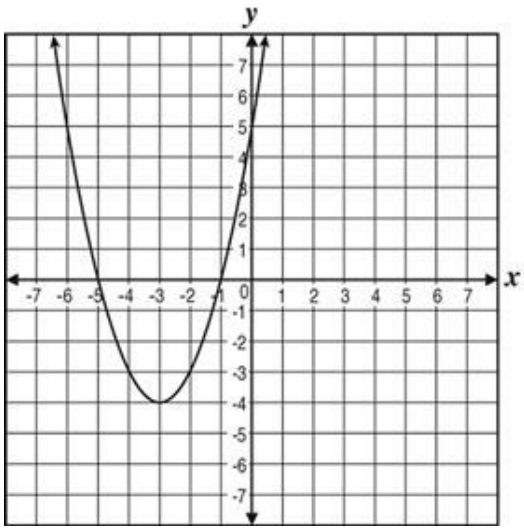
A.



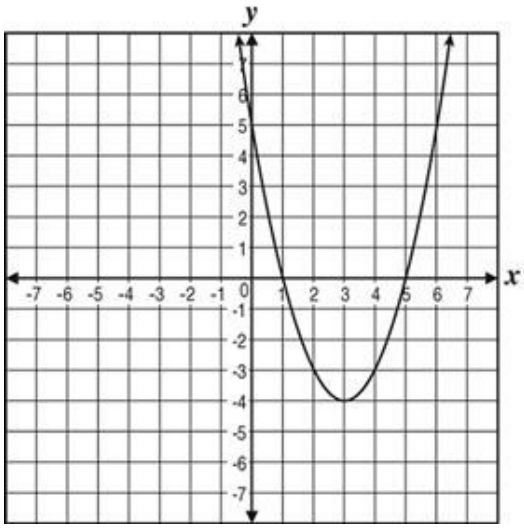
B.



C.



D.



99. **Which points are the *x*-intercepts for the graph of** $y = 2x^2 - 3x - 2$?

A. $\left(0, \frac{1}{2}\right)$ and $(0, -2)$

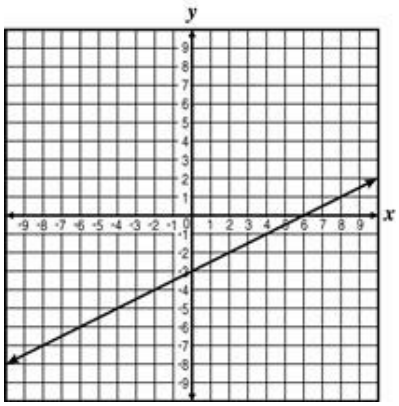
B. $\left(0, -\frac{1}{2}\right)$ and $(0, 2)$

C. $\left(\frac{1}{2}, 0\right)$ and $(-2, 0)$

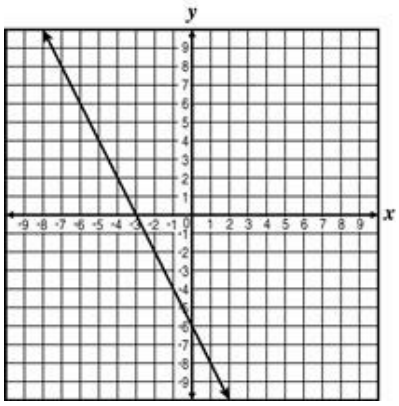
D. $\left(-\frac{1}{2}, 0\right)$ and $(2, 0)$

100. **Which graph shows a line with a *y*-intercept of (0, −3) and an *x*-intercept of (6, 0)?**

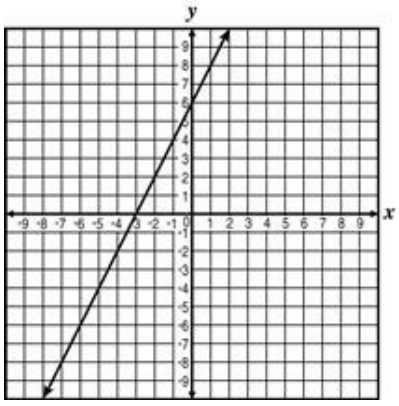
A.



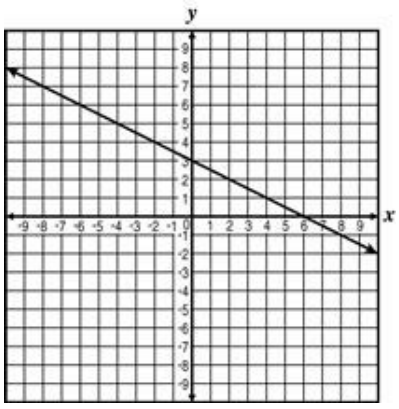
B.



C.

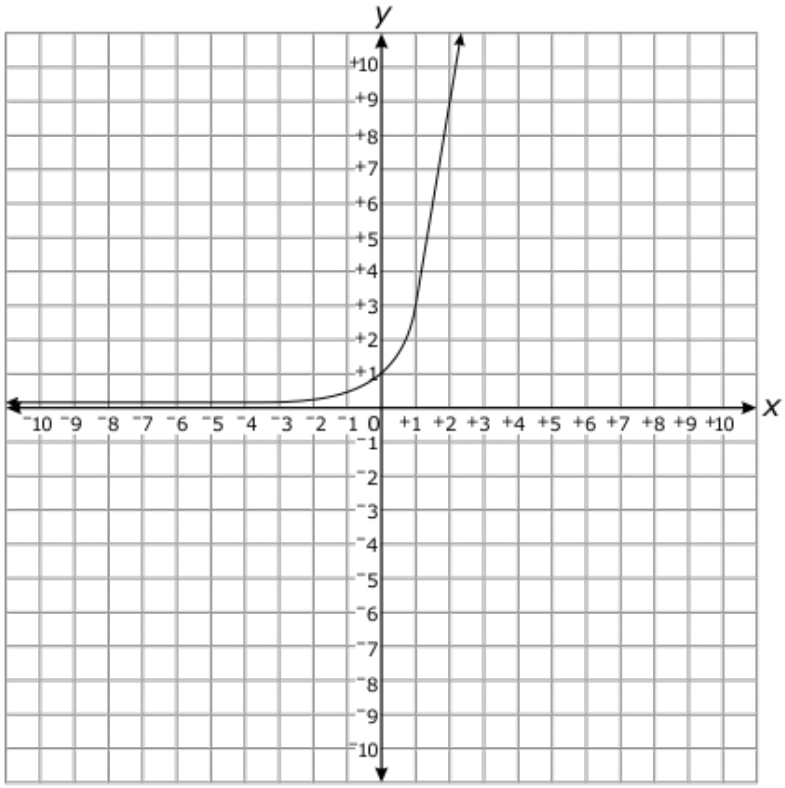


D.



101. Which is the graph of $y = 3^x$?

A.


y
x
+10
+9
+8
+7
+6
+5
+4
+3
+2
+1
−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
−1
−2
−3
−4
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−6
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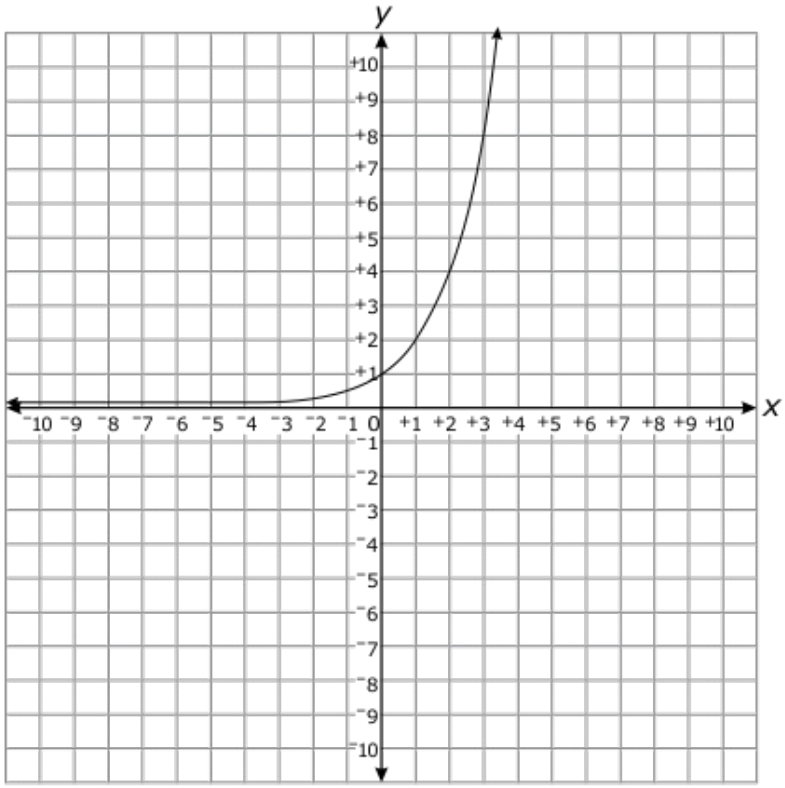
−8
−9
−10

B.


y
x
+10
+9
+8
+7
+6
+5
+4
+3
+2
+1
−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
−1
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−3
−4
−5
−6
−7
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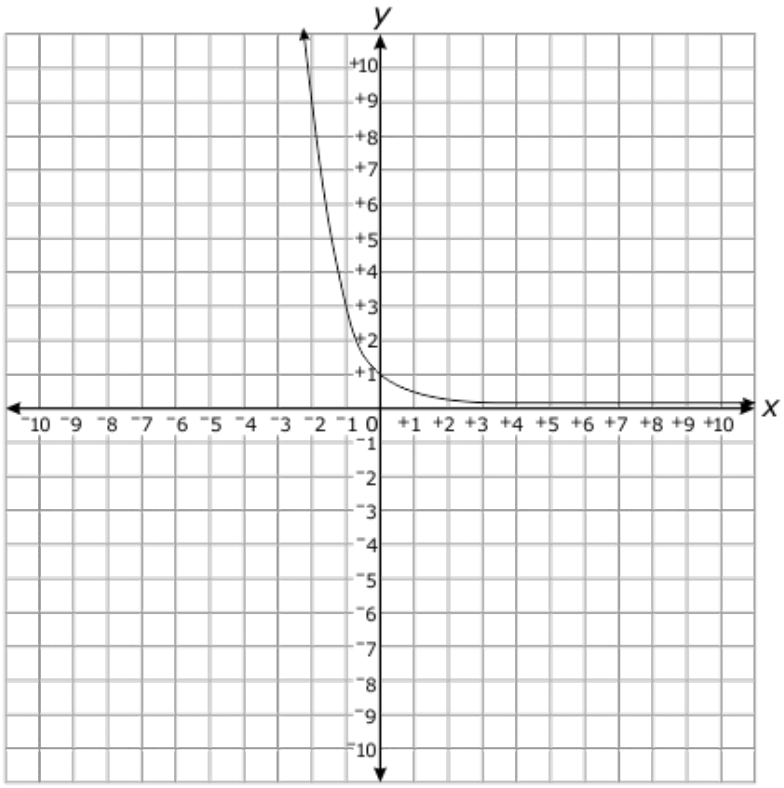
−9
−10

C.


y
x
+10
+9
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+4
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−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
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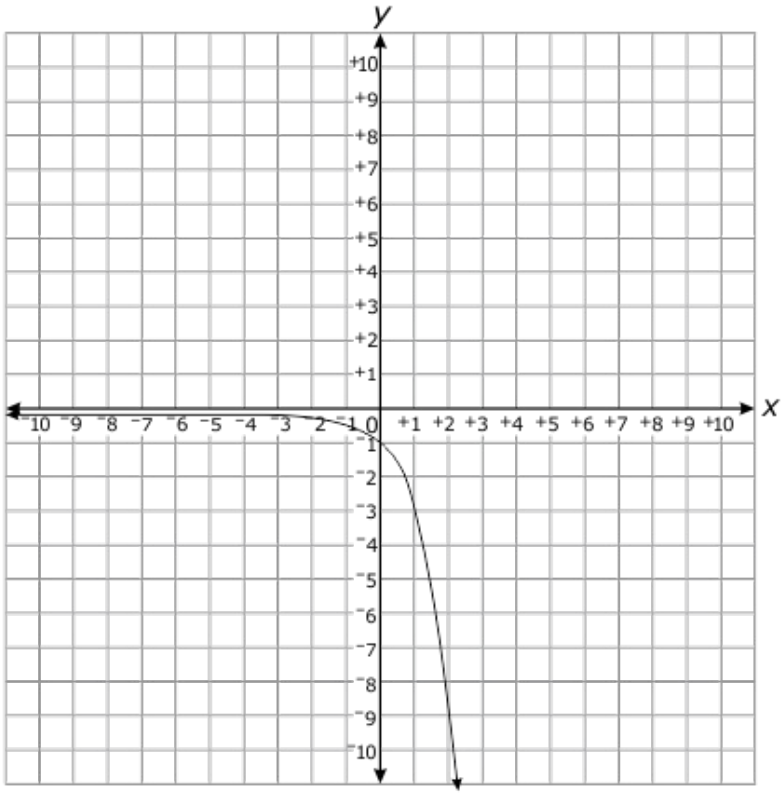
D.


y
x
+10
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+8
+7
+6
+5
+4
+3
+2
+1
−10 −9 −8 −7 −6 −5 −4 −3 −2 −1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
−1
−2
−3
−4
−5
−6
−7
−8
−9
−10

102. **For which domain is the graph of the function *y* = sin *x* symmetrical?**

A. $0 \le x \le \pi$

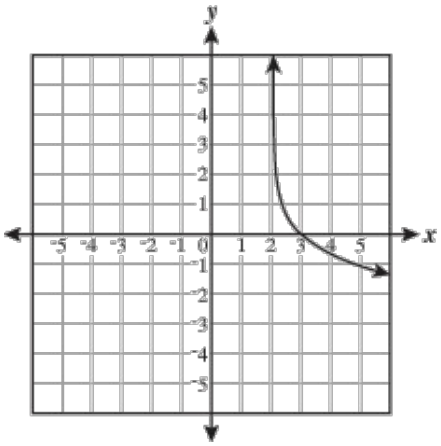
B. $0 \le x \le 2\pi$

C. $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$

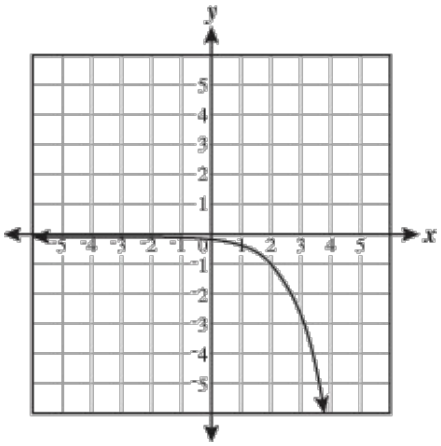
D. $-\pi \le x \le \pi$

103. Which graph shows the function $f(x) = -\ln(x-2)$?

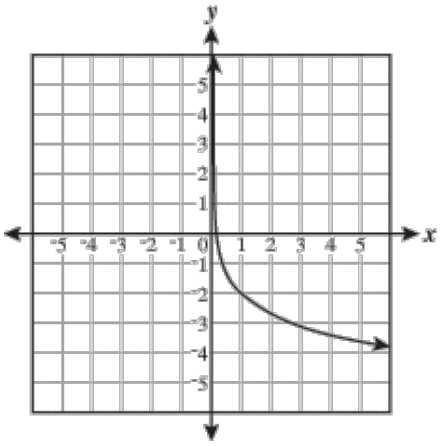
A.



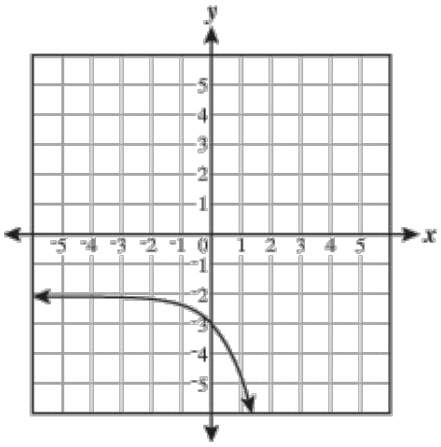
B.



C.

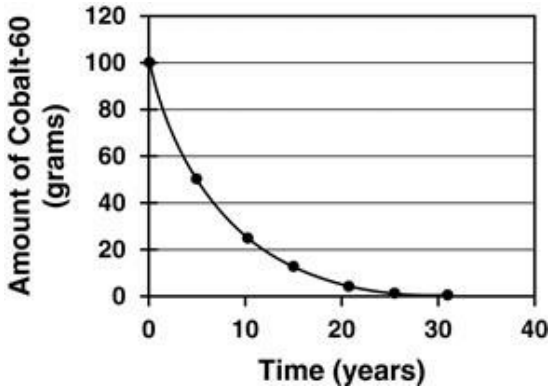


D.

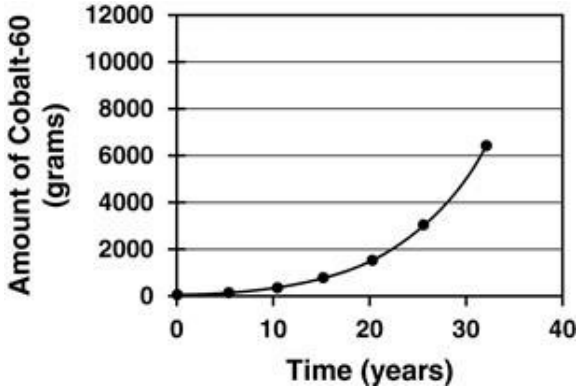


104. **The half-life of a substance is the amount of time it takes for half of the atoms in a sample of the substance to decay. The half-life of cobalt-60 is 5.26 years. If Joan has a 100-gram sample, which graph best represents how much cobalt-60 will be left after 30 years?**

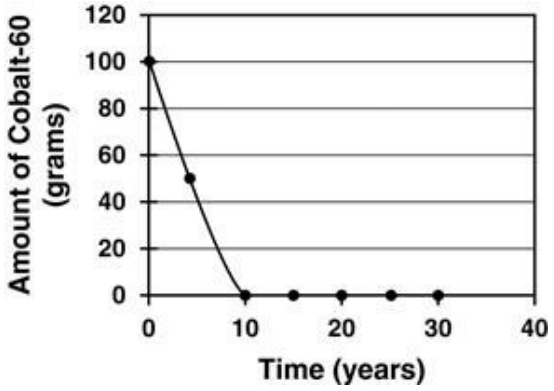
A.



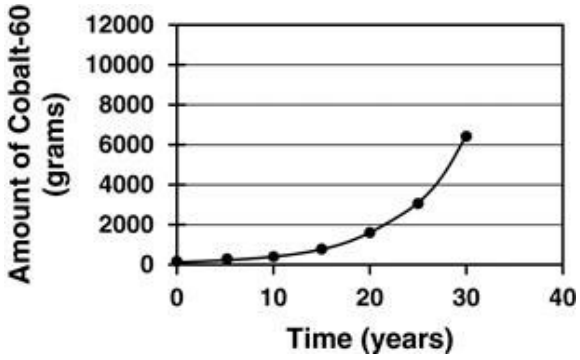
B.



C.



D.



105. **Which equation has a maximum at *y* = 5 for** $0 \le x \le 2\pi$?

A. $y = \sin(5x)$

B. $y = \sin\left(\frac{x}{5}\right)$

C. $y = 5\sin x$

D. $y = \frac{\sin x}{5}$

106. What is the *x*-intercept of the function: $y = \log(x+5) - 3$?

A. $-1{,}005$

B. 995

C. 1,002

D. 4,995

107. **How many local minima does the function** $y = \cos\left(\frac{x}{2}\right)$ **have in the domain** $0 \le x \le 8\pi$?

A. 1

B. 2

C. 4

D. 8

108. Which describes the end behaviors of the graph of $y = \left(\frac{1}{4}\right)^x + 2$?

A. as $x \to \infty,\ y \to 2$ and as $x \to -\infty,\ y \to \infty$

B. as $x \to \infty,\ y \to \infty$ and as $x \to -\infty,\ y \to -2$

C. as $x \to \infty,\ y \to -2$ and as $x \to -\infty,\ y \to -\infty$

D. as $x \to \infty,\ y \to \infty$ and as $x \to -\infty,\ y \to 2$

109. Which equation, when graphed, is an exponential growth function with a *y*-intercept at 2?

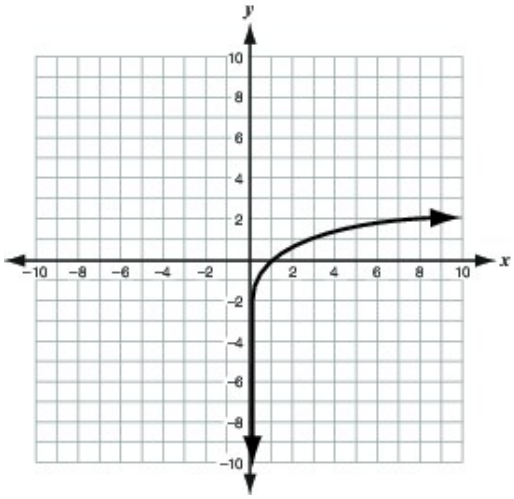
A. $y = 2x$

B. $y = 2(2)^x$

C. $y = 2(0.5)^x$

D. $y = x^2 + 2$

110. What is the end behavior of the graph shown below?



A. $f(x) \to \infty$ as $x \to 0^+$ and $f(x) \to \infty$ as $x \to \infty$

B. $f(x) \to \infty$ as $x \to 0^+$ and $f(x) \to -\infty$ as $x \to \infty$

C. $f(x) \to -\infty$ as $x \to 0^+$ and $f(x) \to \infty$ as $x \to \infty$

D. $f(x) \to -\infty$ as $x \to 0^+$ and $f(x) \to -\infty$ as $x \to \infty$

111. Jessica graphs a sine function that has the features listed below.

- Period of $\pi\pi$
- Amplitude of 4
- Midline of $y = 3y = 3$

She claims that the function $f(x) = 4\sin(\pi x) + 3f(x) = 4\sin(\pi x) + 3$ has all of these features. Is this the correct function for the graph? Why or why not?

A. No, Jessica's function has a period of 2.

B. No, Jessica's function has a period of 4 and an amplitude of $\pi.\pi$.

C. No, Jessica's function has an amplitude of 3 and a midline of $y = 4$. $y = 4$.

D. Yes, Jessica's function has a period of π,π, an amplitude of 4, and a midline of $y = 3.y = 3$.

112. What is the *y*-intercept of the graph of $y = 100(2)^x - 5$?

A. $(0, -5)$

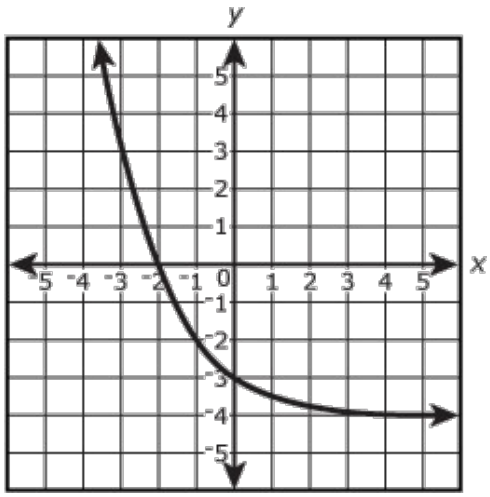
B. $(0, 45)$

C. $(0, 95)$

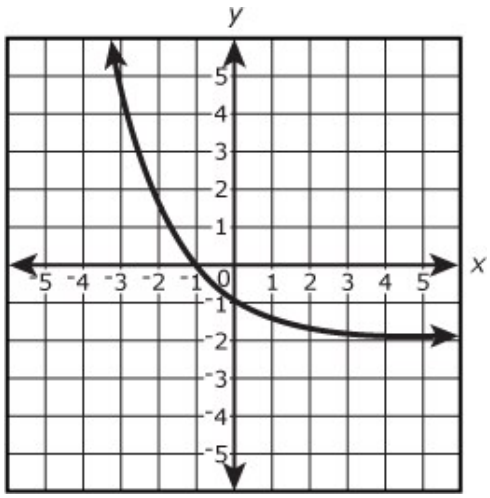
D. $(0, 195)$

113. Which coordinate graph shows an exponential function with an *x*-intercept of -2 and a *y*-intercept of -3?

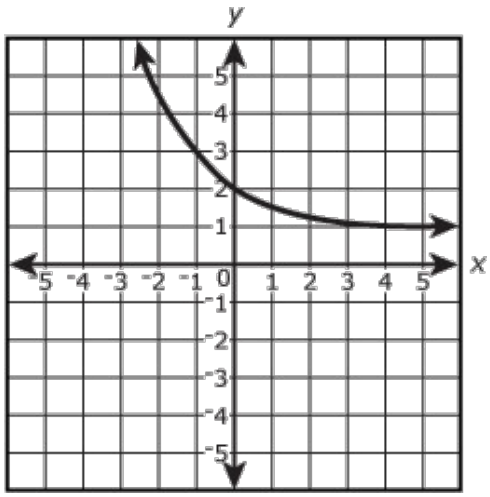
A.



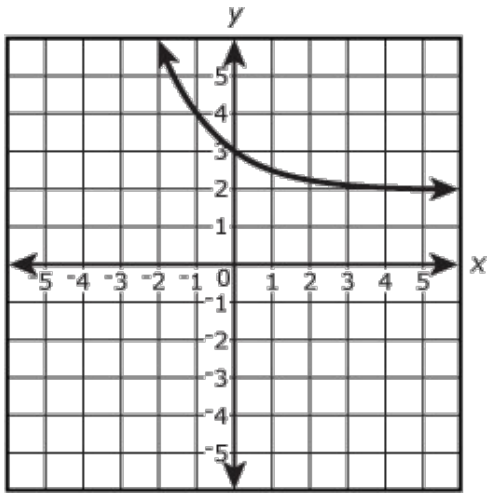
B.



C.



D.



114. What is the *x*-intercept of the function $y = 4(2)^x - 16$?

A. $(\bar{}16, 0)$

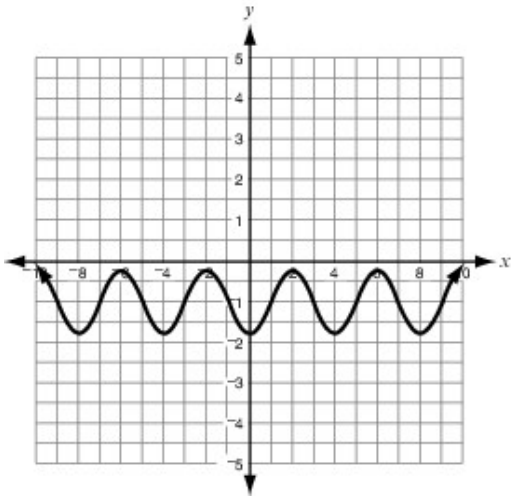
B. $(\bar{}8, 0)$

C. (2, 0)

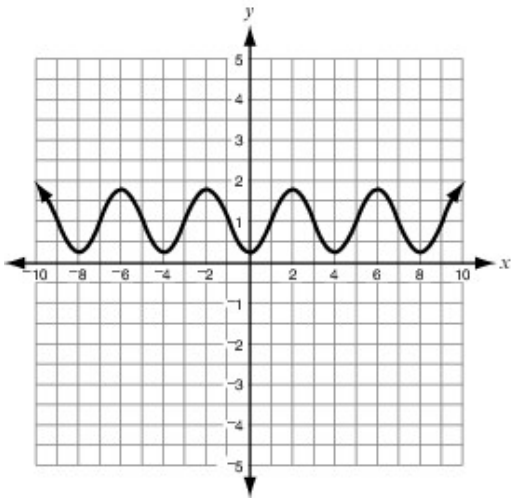
D. (4, 0)

115. Which graph represents the function $f(x) = -\frac{3}{2}\cos\left(\frac{\pi}{2}x\right) + 1$?

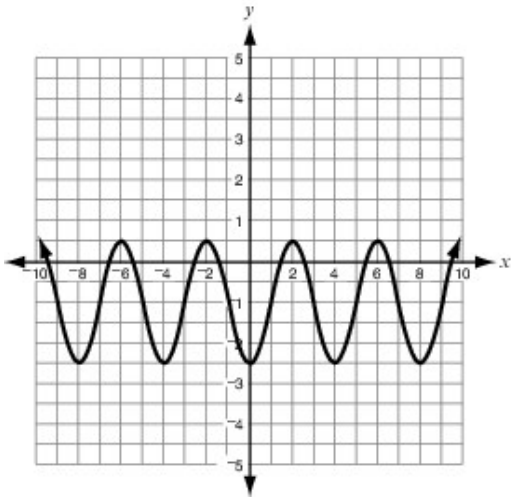
A.



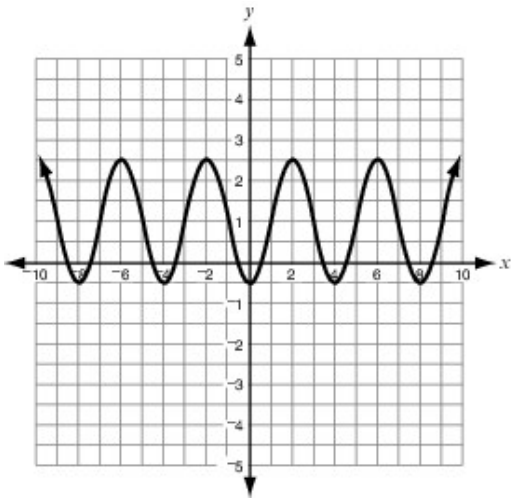
B.



C.



D.



116. **Which of the following increases without bound for all** $x > 0$?

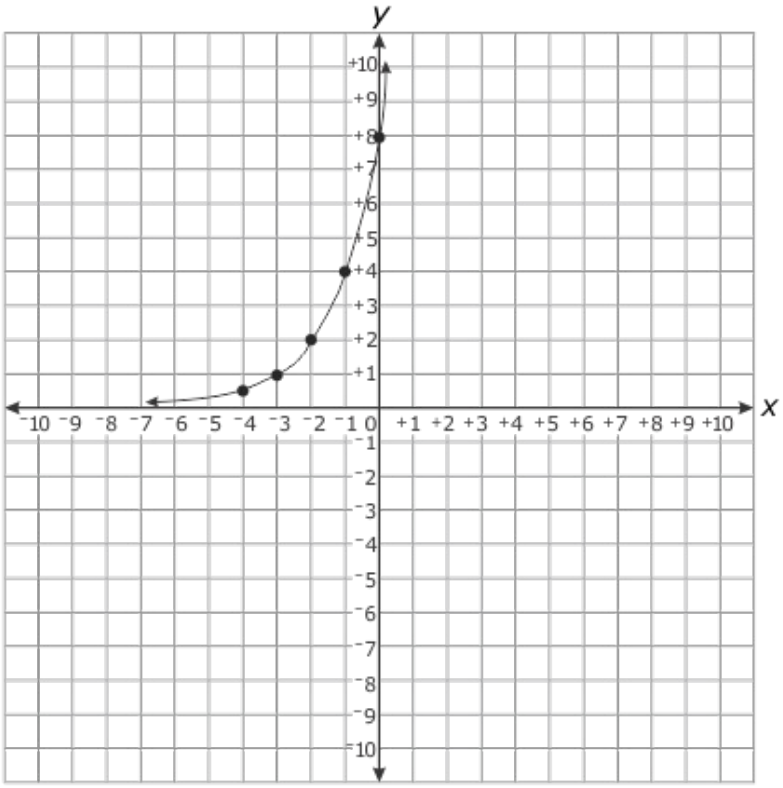
A. $y = \sin x$

B. $y = \sec x$

C. $y = \ln x$

D. $y = -x^2$

117. Which is an equation of the function graphed below?



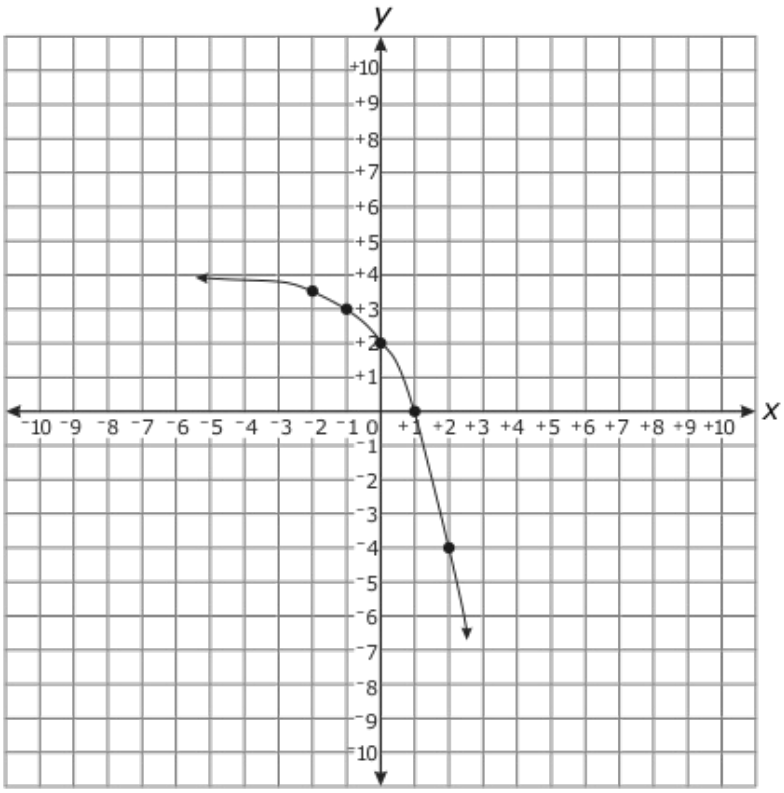
A. $y = 2^{(x+1)}$

B. $y = 2^{(x+3)}$

C. $y = 4^{(x+1)}$

D. $y = 4^{(x+2)}$

118. Which is an equation of the function graphed below?



A. $y = 2^x + 2$

B. $y = {}^-2^x + 4$

C. $y = 2(2)^x + 2$

D. $y = {}^-2(2)^x + 4$

119. **On which interval is the function** $f(x) = 3\sin(2x), 0 < x < \pi$, **decreasing?**

A. $0 < x < \frac{\pi}{4}$

B. $\frac{3\pi}{4} < x < \pi$

C. $\frac{\pi}{4} < x < \frac{3\pi}{4}$

D. $\frac{\pi}{2} < x < \pi$

120. **Let *x* represent an angle measured in radians. Which of the functions increases over the interval $0 \le x \le \pi$?**

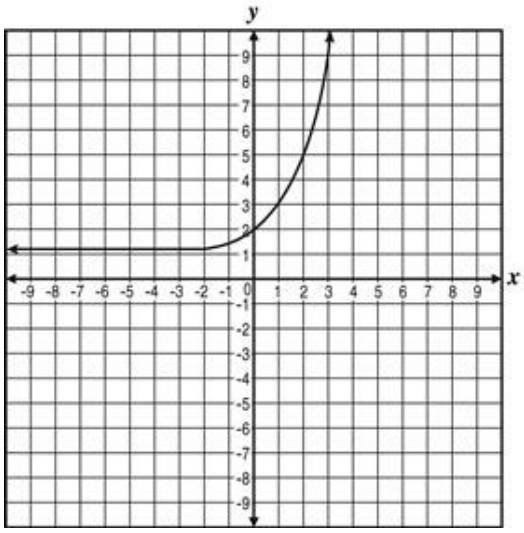
A. $f(x) = \sin(x)$

B. $f\left(x\right) = \sin\left(\frac{x}{2}\right)$

C. $f(x) = \cos(x)$

D. $f\left(x\right) = \cos\left(\frac{x}{2}\right)$

121. **Which function is represented by the following graph?**



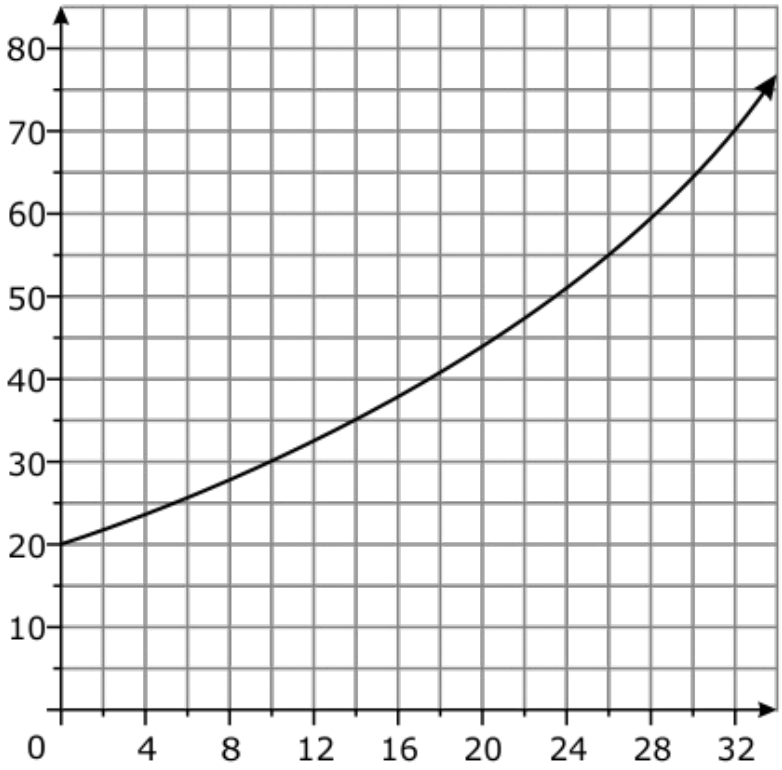
A. $y = 2x + 1$

B. $y = 2^x + 1$

C. $y = x^2 + 1$

D. $y = x^3 + 1$

122. The exponential graph, $f(x)$, is shown below.



Which statement ***best*** describes $f(x)$?

A. The function increases at a rate of 104%.

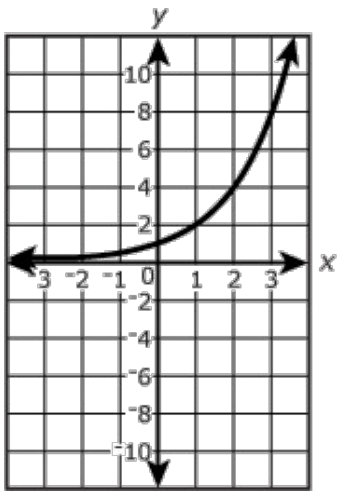
B. The function increases at a rate of 14%.

C. The function increases at a rate of 4%.

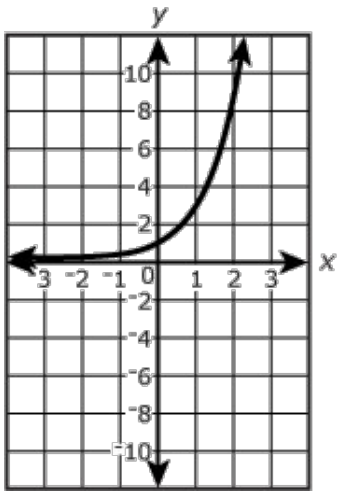
D. The function increases at a rate of 1.4%.

123. Which graph represents the equation $y = \left(\frac{1}{2}\right)^x$?

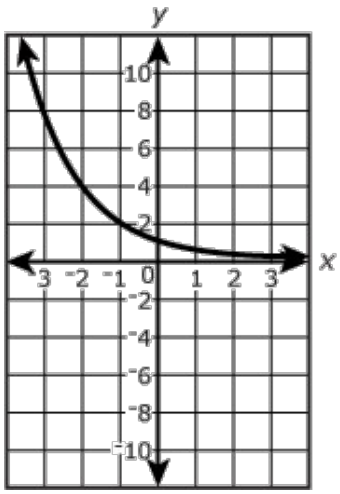
A.



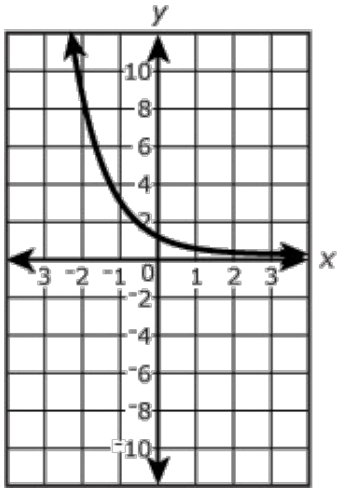
B.



C.

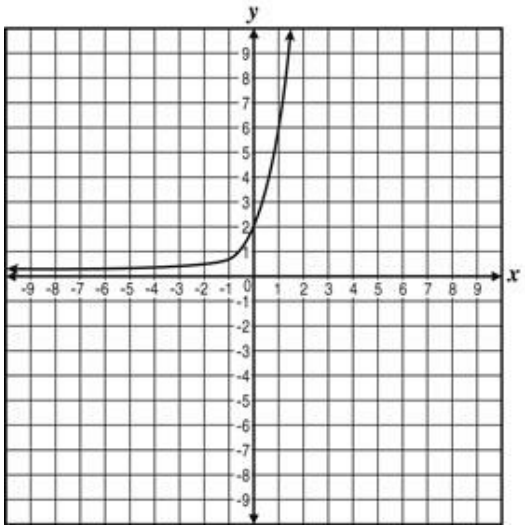


D.

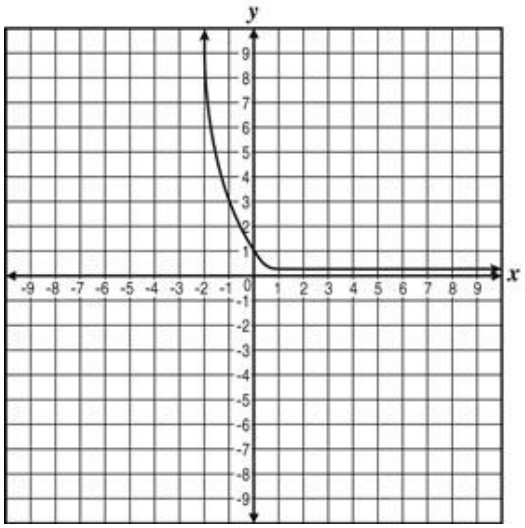


124. **Which graph is an exponential function of the form** $y = b^x$ **where *b* is greater than 1?**

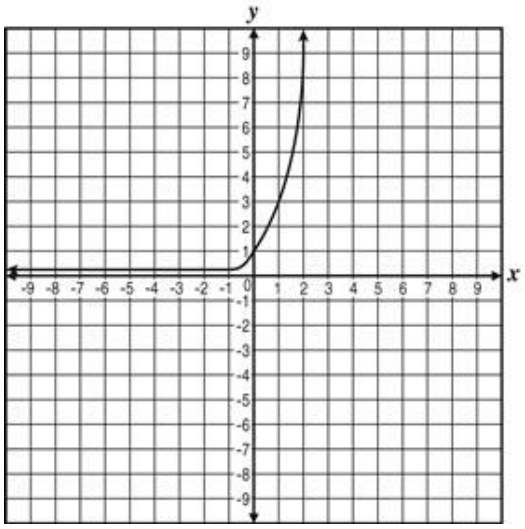
A.



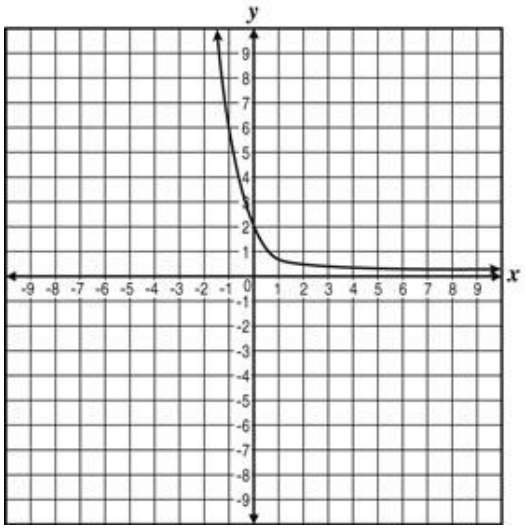
B.



C.

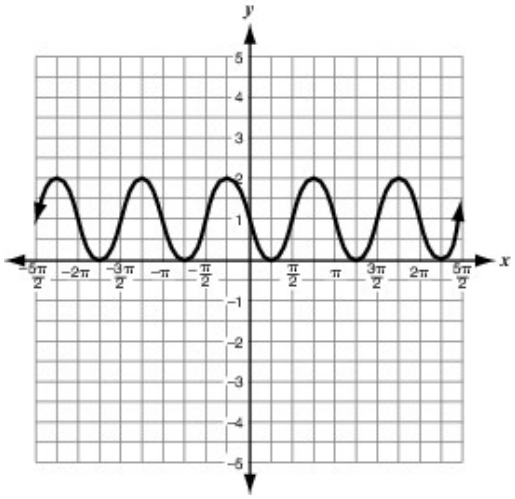


D.

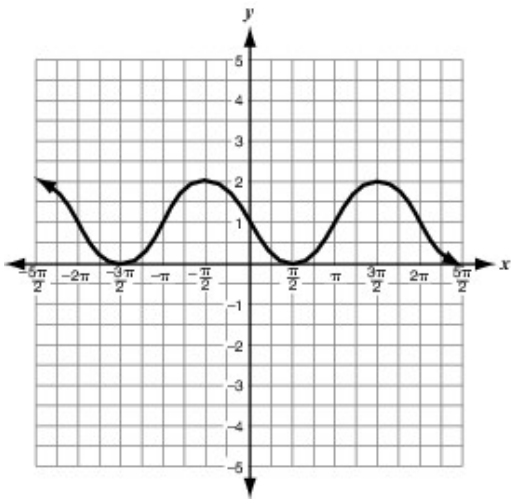


125. Which graph represents a function that has an amplitude of 1 and a period of π?

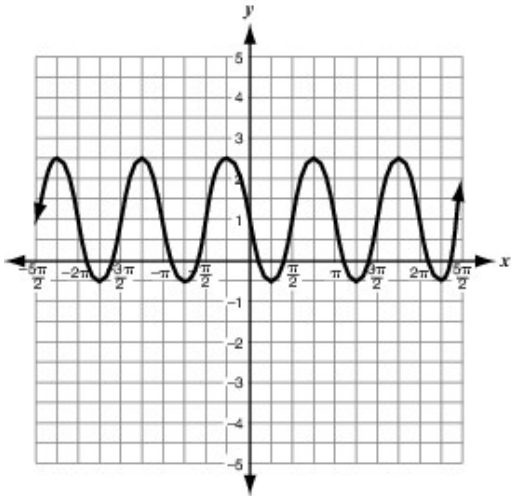
A.



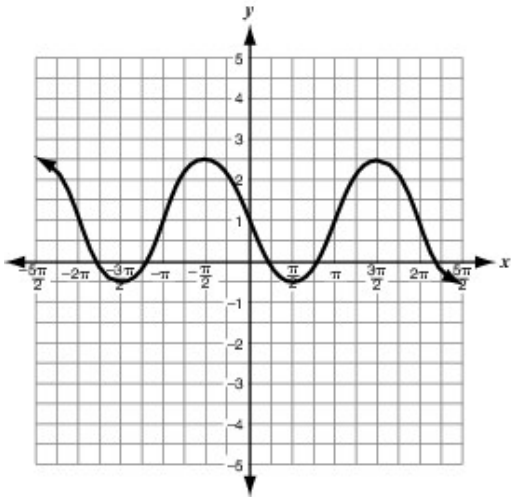
B.



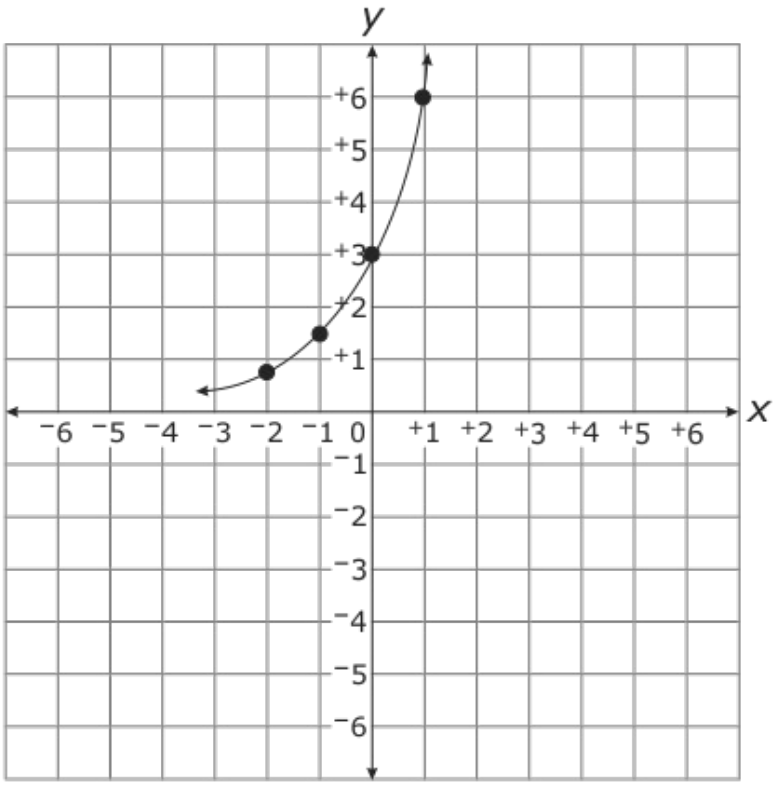
C.


y
x
5
4
3
2
1
−1
−2
−3
−4
−5
$-\frac{5\pi}{2}$
-2π
$-\frac{3\pi}{2}$
$-\pi$
$-\frac{\pi}{2}$
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
2π
$\frac{5\pi}{2}$

D.


y
x
5
4
3
2
1
−1
−2
−3
−4
−5
$-\frac{5\pi}{2}$
-2π
$-\frac{3\pi}{2}$
$-\pi$
$-\frac{\pi}{2}$
$\frac{\pi}{2}$
π
$\frac{3\pi}{2}$
2π
$\frac{5\pi}{2}$

126. Which is an equation of the function graphed below?



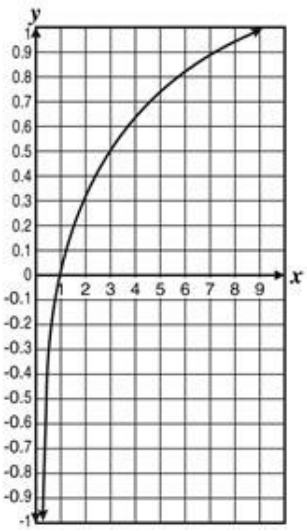
A. $y = 3^x$

B. $y = 3^x + 2$

C. $y = 3(2)^x$

D. $y = 2(3)^x$

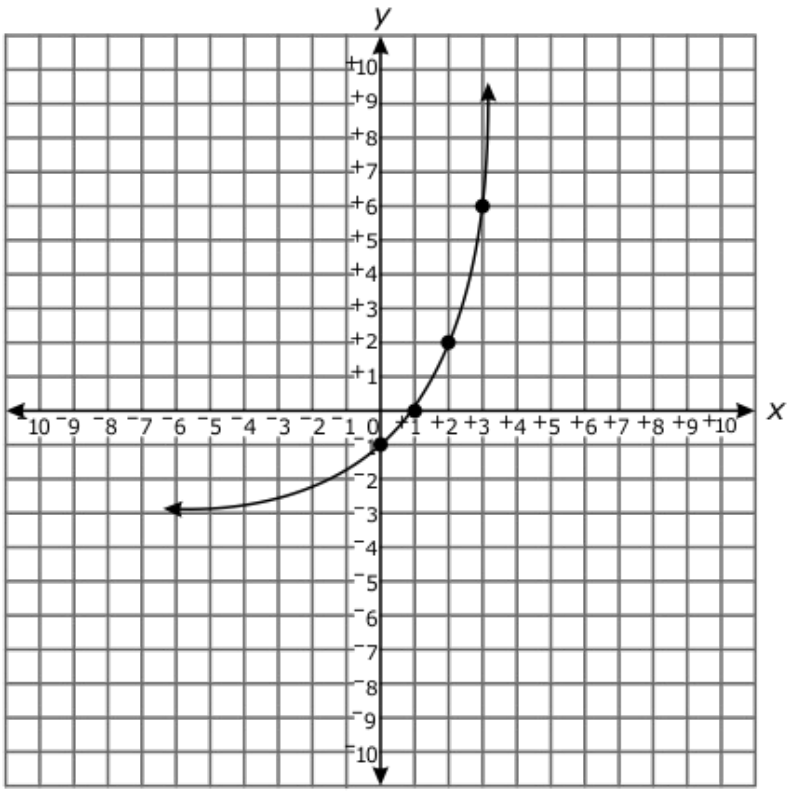
127. **The graph of $y = \log_9 x$ is shown below.**



If *x* is positive, what is the solution to the inequality $\log_9 x > \frac{1}{2}$?

A. $x > 3$
B. $x > 4.5$
C. $0 < x < 3$
D. $0 < x < 4.5$

128. Which function is graphed below?



A. $f(x) = 2^{(x-2)}$

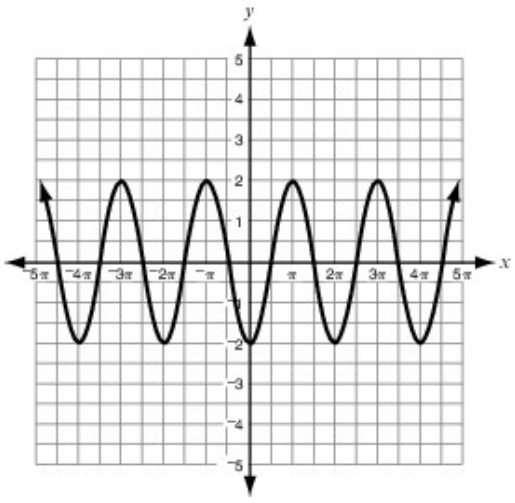
B. $f(x) = 2^{x} - 2$

C. $f(x) = 2^{(x-1)}$

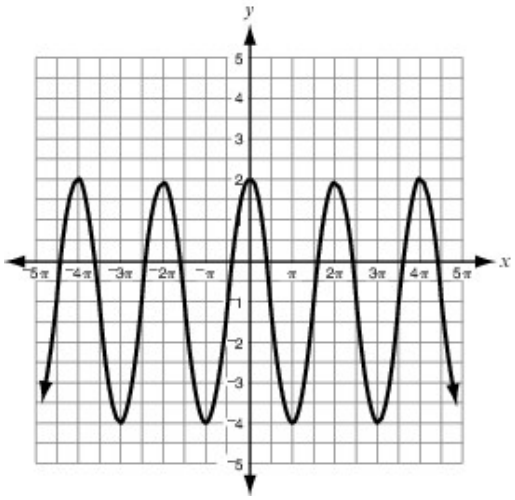
D. $f(x) = 2^{x} - 1$

129. Which graph represents a trigonometric function with an amplitude of 2?

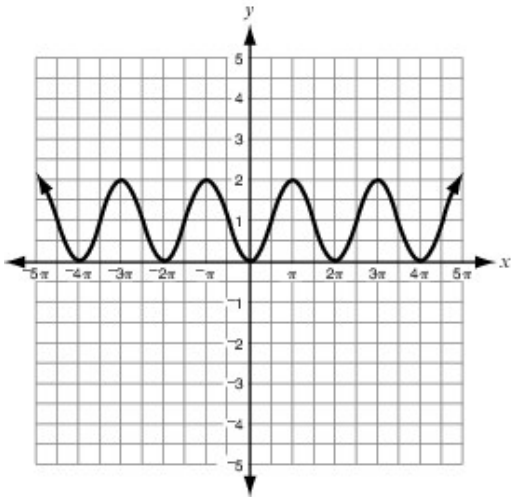
A.



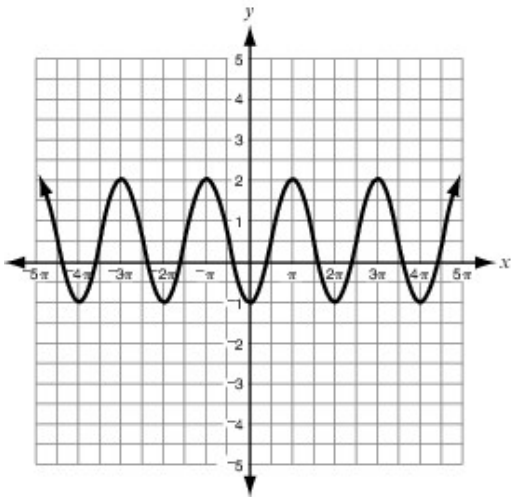
B.


y
x
5
4
3
2
1
−1
−2
−3
−4
−5
−5π
−4π
−3π
−2π
−π
π
2π
3π
4π
5π

C.


y
x
5
4
3
2
1
−1
−2
−3
−4
−5
−5π
−4π
−3π
−2π
−π
π
2π
3π
4π
5π

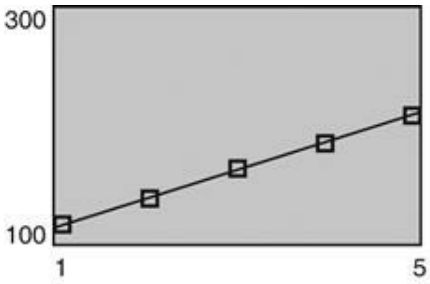
D.

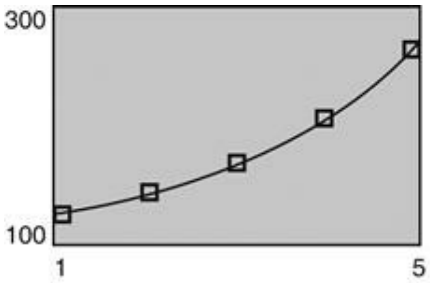

y
x
5
4
3
2
1
−1
−2
−3
−4
−5
−5π
−4π
−3π
−2π
−π
π
2π
3π
4π
5π

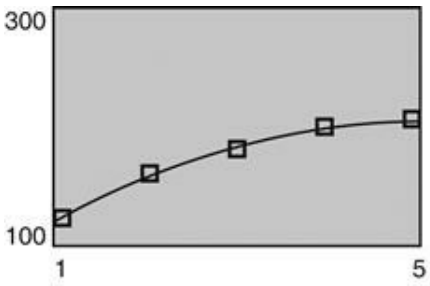
130. **Where does the function $y = \cos\left(\frac{x}{2}\right)$ have a minimum within the domain $0 \le x \le 2\pi$?**

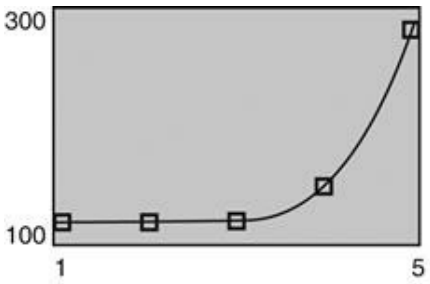
A. 0
B. $\frac{x}{2}$
C. π
D. 2π

131. **Tracy is on a bowling team. In her first tournament, her average score was 125. She increased her average score by 20% in each tournament after that. Which calculator display shows a graph that best represents Tracy's bowling scores in her first 5 tournaments?**

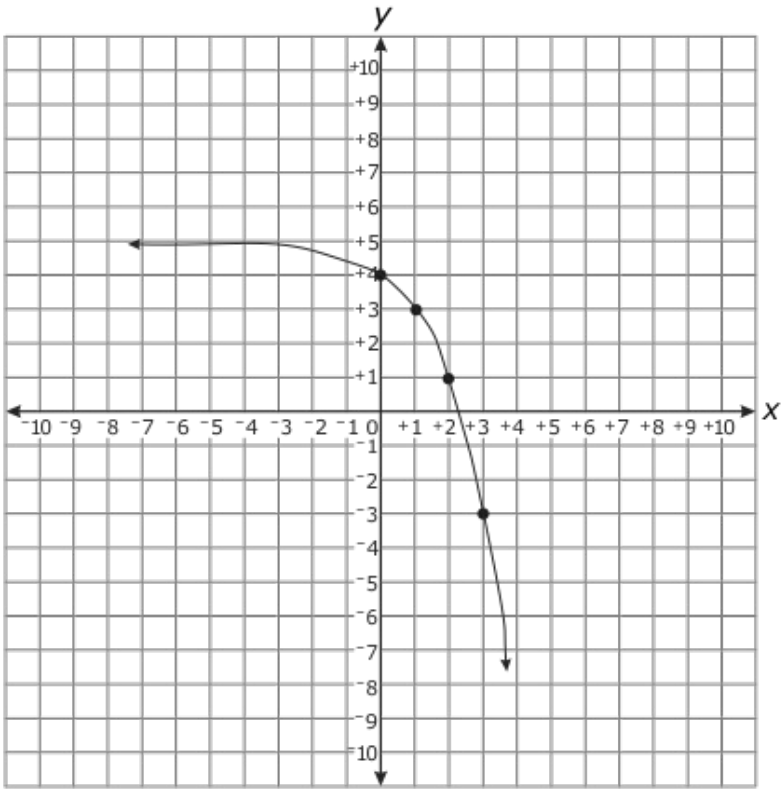
A.


B.


C.


D.


132. Which is an equation of the function graphed below?



A. $f(x) = {}^{-}2^{x} + 4$

B. $f(x) = {}^{-}2^{x} + 5$

C. $f(x) = {}^{-}2x + 4$

D. $f(x) = {}^{-}2x + 5$

133. How do the graphs of $y = 2^{x}$ and $y = 2^{-x}$ compare?

A. They are the same.

B. They are reflections of each other across the x-axis.

C. They are reflections of each other across the line $y = x$.

D. They are reflections of each other across the y-axis.

134. **Which of the following functions increases the most over the interval $0 \le x \le \pi$?**

A. $f(x) = \sin x$

B. $f(x) = 2 \sin x$

C. $f(x) = \sin\left(\frac{x}{2}\right)$

D. $f(x) = \sin x + 2$

135. What is the *y*-intercept for the graph of the function $f(x) = 30(1.05)^x$?

A. 0

B. 1

C. 5

D. 30

136. **Which of the following statements is true about the graphs of a linear function $f(x) = mx + b$ and that of an exponential function $g(x) = a^x$, where a > 0 and $a \neq 1$?**

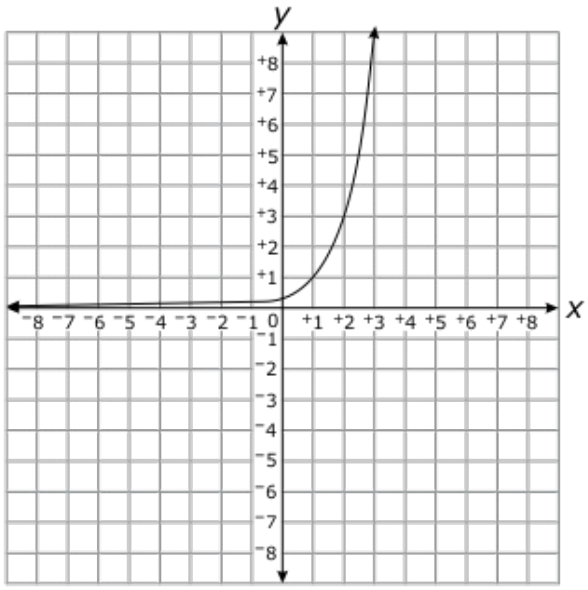
A. *f* has a constant rate of change while *g* does not

B. *g* has a constant rate of change while *f* does not

C. both have constant rates of change

D. neither has a constant rate of change

137. Which is an equation of the function graphed below?



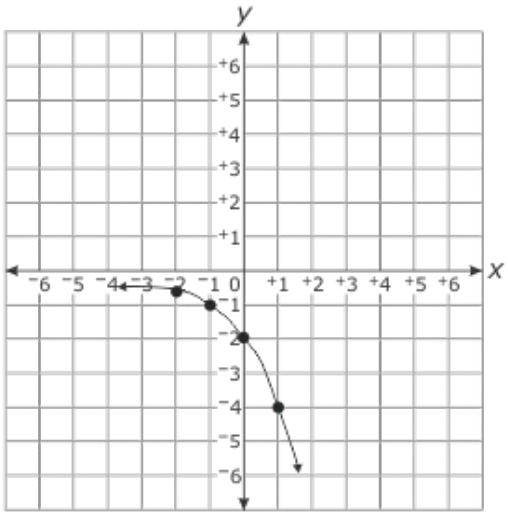
A. $y = \left(\frac{1}{3}\right)^{(x+1)}$

B. $y = \left(\frac{1}{3}\right)^{(x-1)}$

C. $y = 3^{(x+1)}$

D. $y = 3^{(x-1)}$

138. Which exponential function represents the graph?



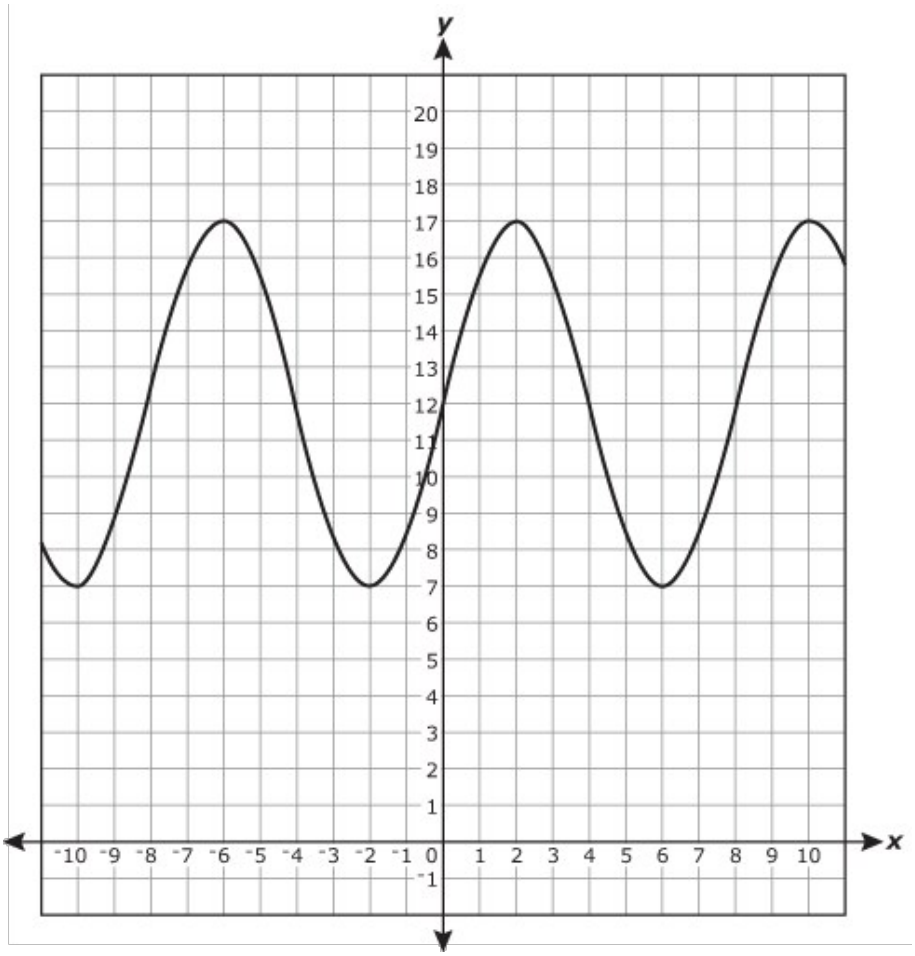
A. $f(x) = {}^{-}2^{x}$

B. $f(x) = 2^{x}$

C. $f(x) = 2({}^{-}2)^{x}$

D. $f(x) = {}^{-}2(2)^{x}$

139. The graph below is of the form $f(x) = a + b\sin(cx)$ where *a*, *b*, and *c* are non-zero real numbers.



Which values **best** approximate the values of *a* and *b*?

A. $a = 12$ and $b = 5$

B. $a = 12$ and $b = 10$

C. $a = 17$ and $b = 5$

D. $a = 17$ and $b = 10$

140. **Which function has asymptote at** $x = 2\pi$?

A. $y = \sin\left(\frac{x}{2}\right)$

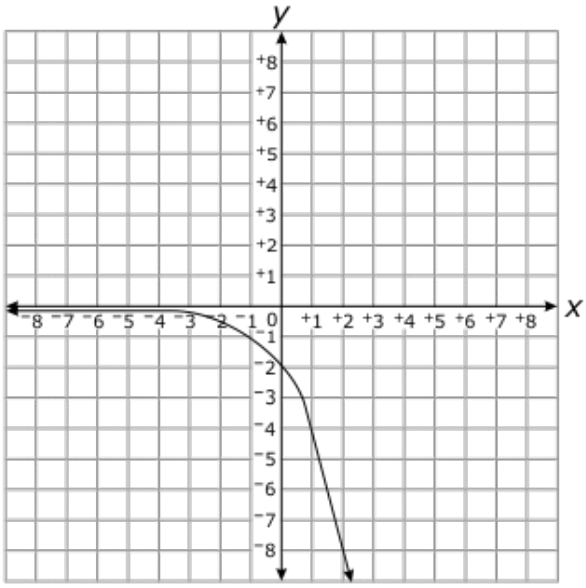
B. $y = \tan\left(\frac{x}{2}\right)$

C. $y = \sec\left(\frac{x}{2}\right)$

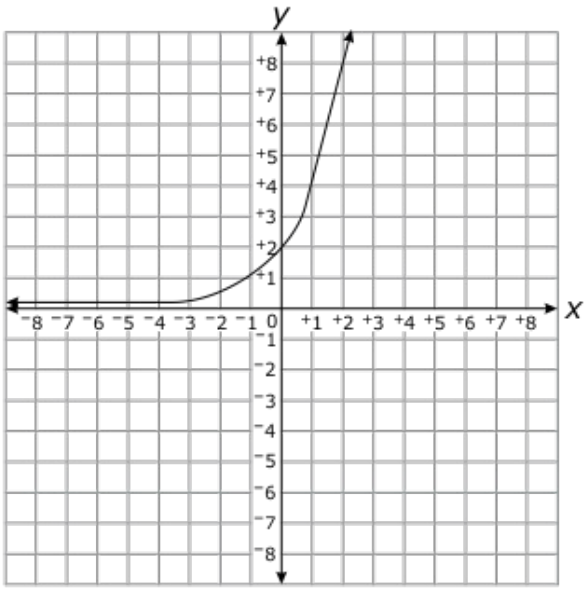
D. $y = \cot\left(\frac{x}{2}\right)$

141. Which is the graph of $y = -2(2)^x$?

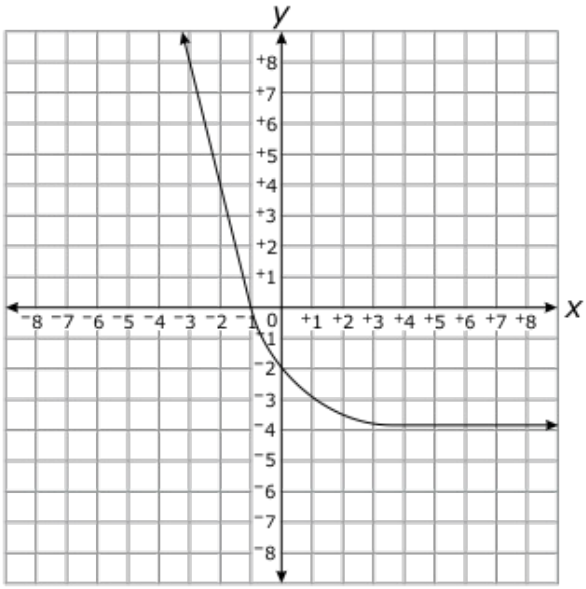
A.



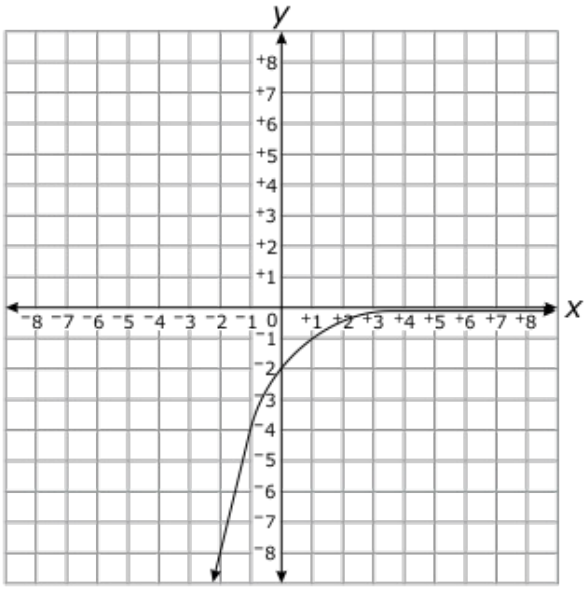
B.



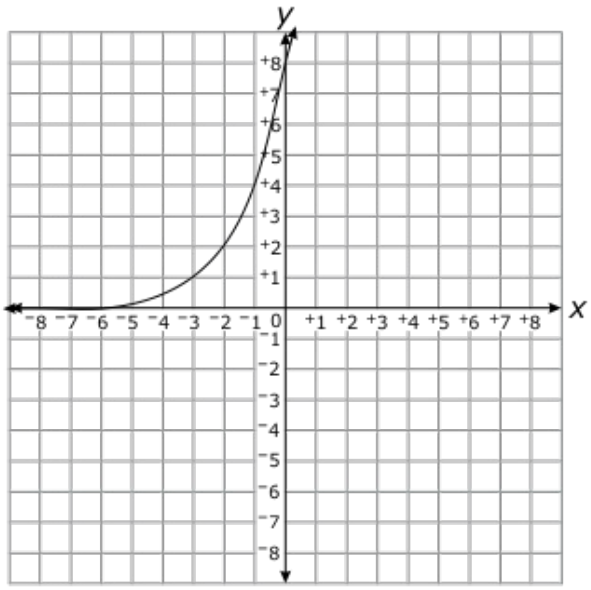
C.



D.



142. Which is an equation of the function graphed below?



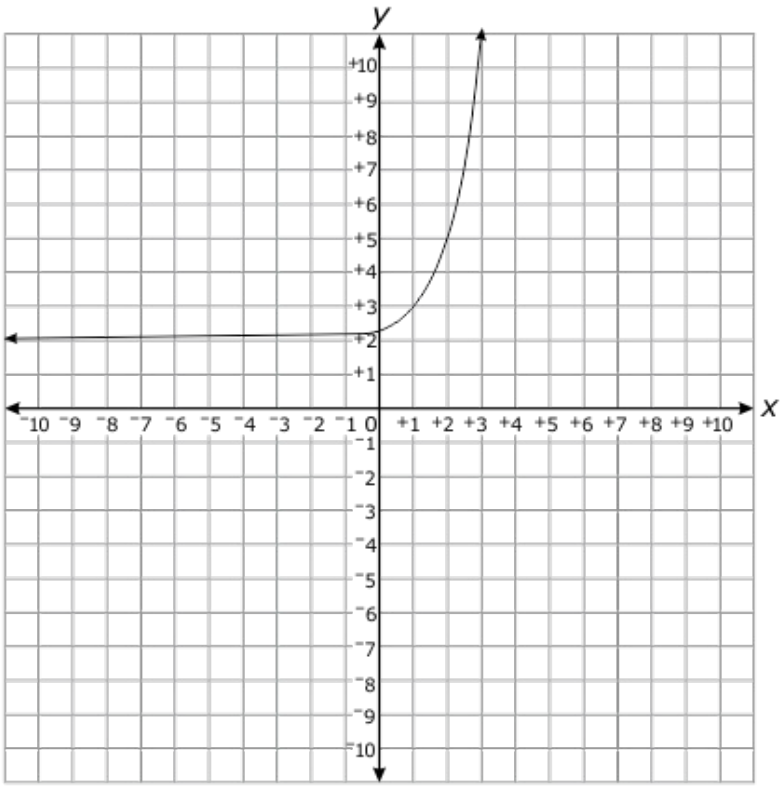
A. $y = 2^{(x+3)}$

B. $y = 2^{(x-3)}$

C. $y = 3^{(x+2)}$

D. $y = 3^{(x-2)}$

143. Which is an equation of the function graphed below?



A. $y = 2^{x-1} + 3$

B. $y = 2^{x+1} - 3$

C. $y = 3^{x-1} + 2$

D. $y = 3^{x+1} - 2$

144. What is the y-intercept of the graph of $f(x) = 2(1.5)^x + 3$?

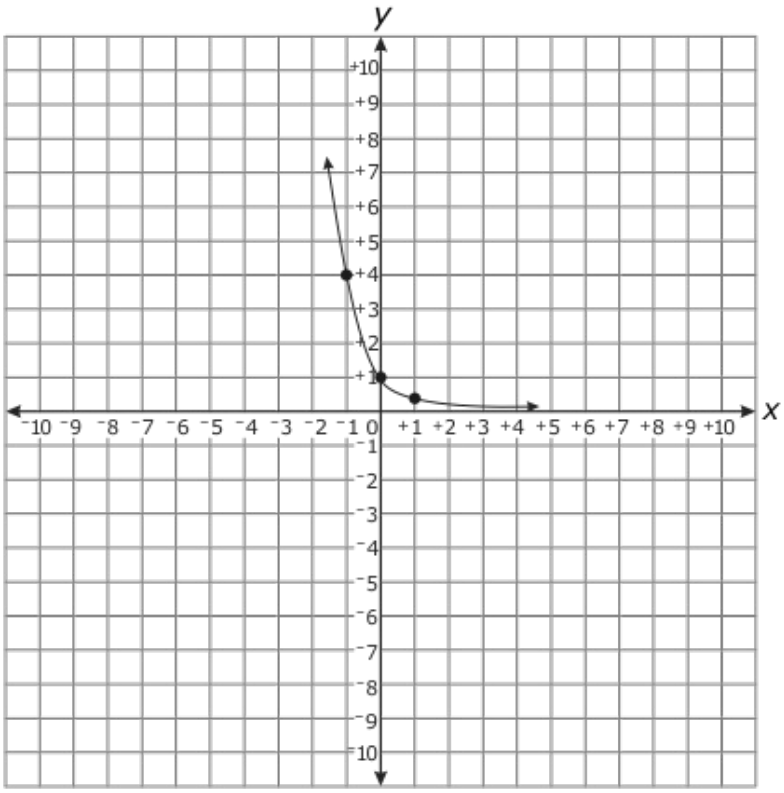
A. 2

B. 3

C. 4

D. 5

145. Which is an equation of the function graphed below?



A. $y = 4^{-x}$

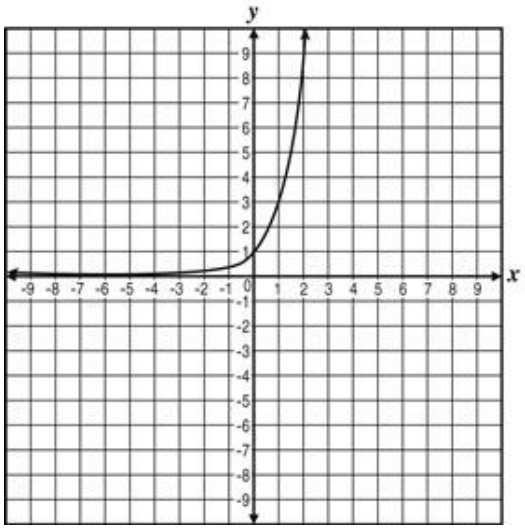
B. $y = 4^{x}$

C. $y = 4^{-x} + 1$

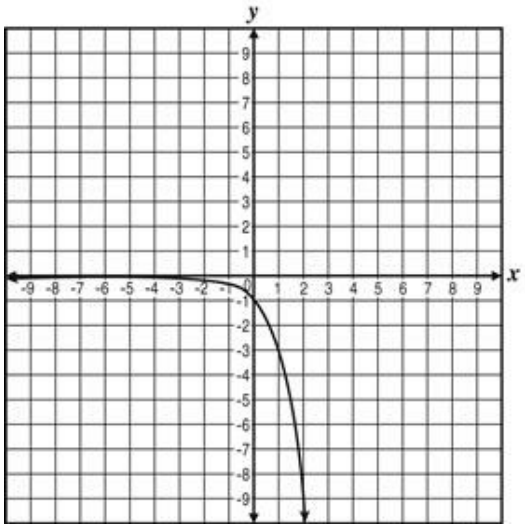
D. $y = 4^{x} + 1$

146. **Which graph is defined by the function equation** $y = -(3^{x})$ **?**

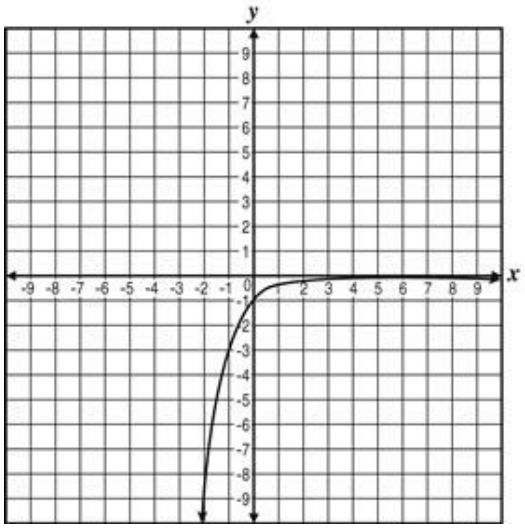
A.



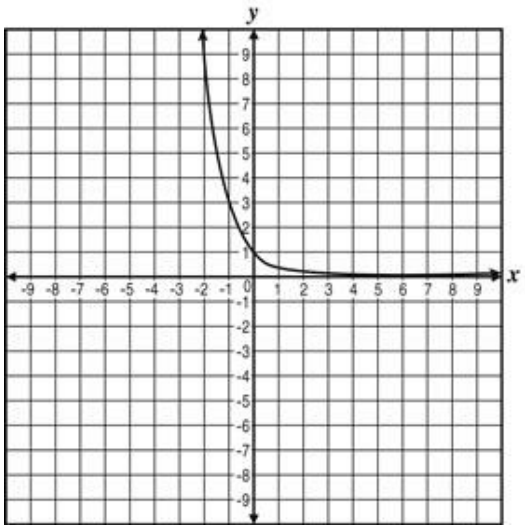
B.



C.



D.

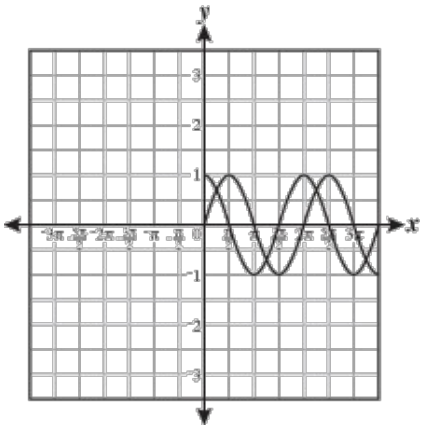


147. **The graph of $y = \cos(x)$ is symmetric about which geometric object, if x is measured in radians?**

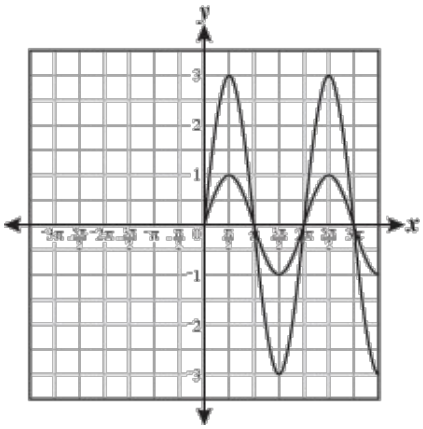
A. the x-axis
B. the y-axis
C. the line $y = x$
D. the point (0, 0)

148. Which graph shows two sinusoidal functions with the same period, but with different amplitudes?

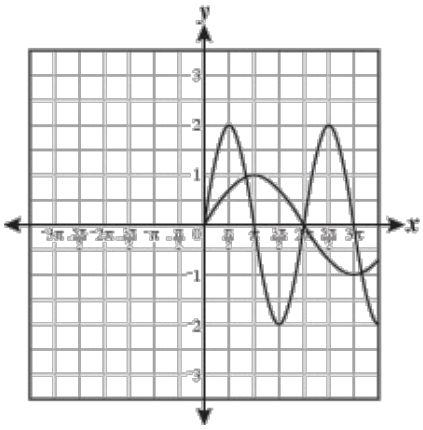
A.



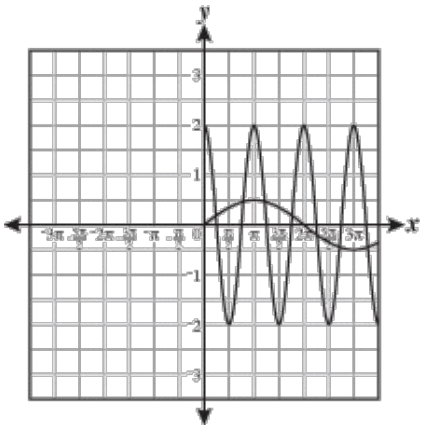
B.



C.

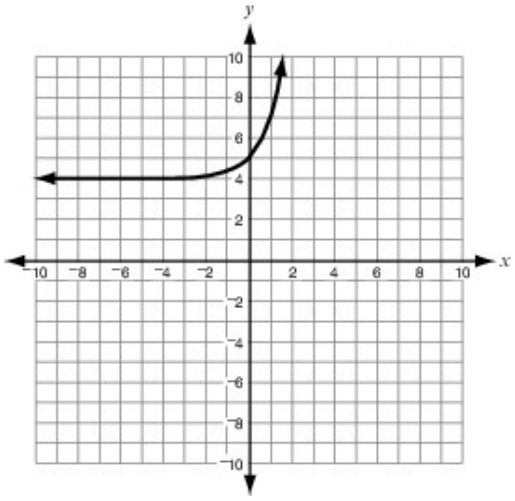


D.

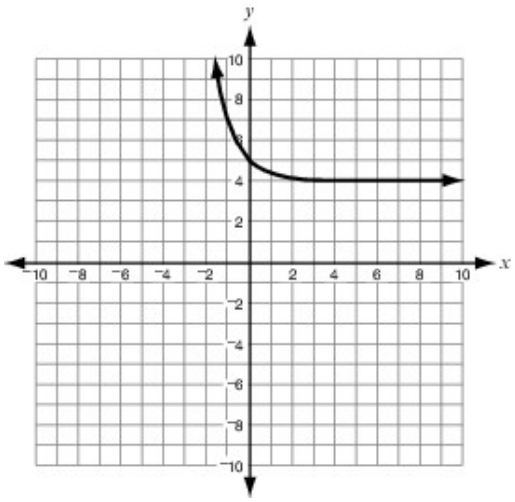


149. Which graph represents the function $f(x) = 3^{-x} + 4$?

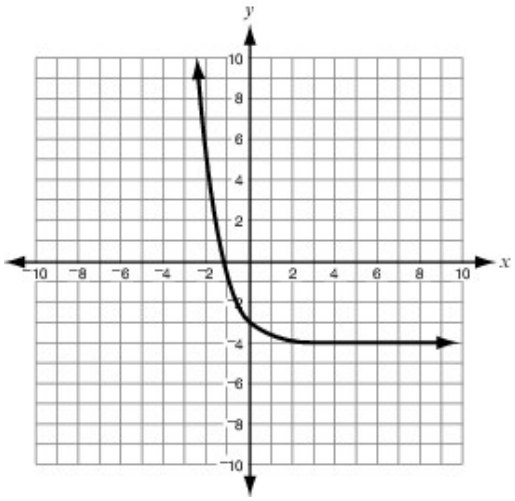
A.



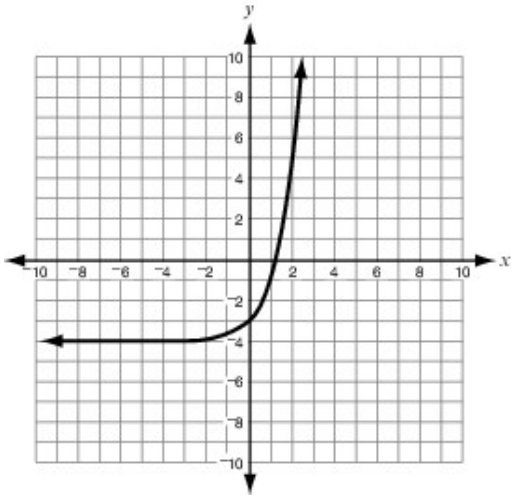
B.



C.

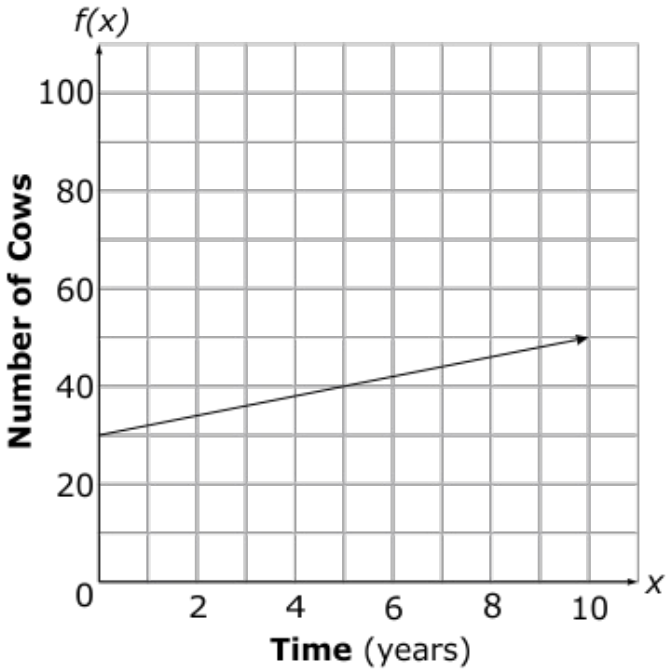


D.

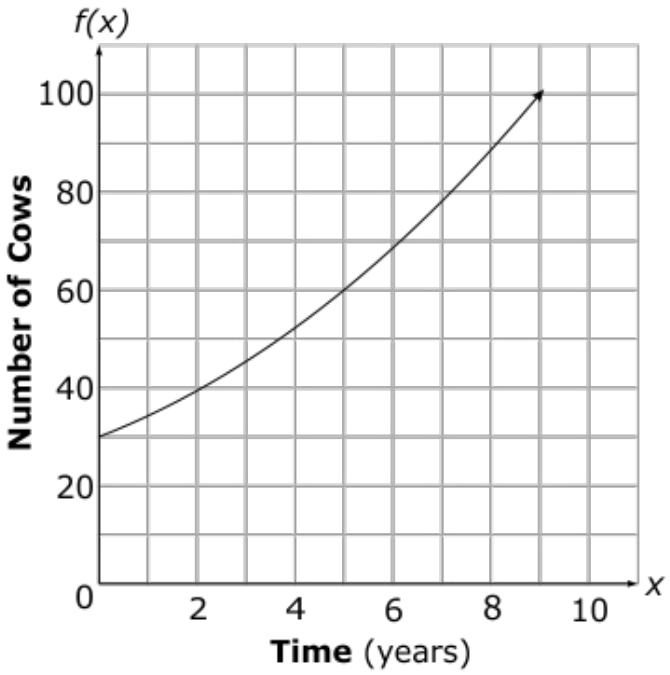


150. Which graph ***best*** displays an initial population of 30 cows that is doubling every 5 years?

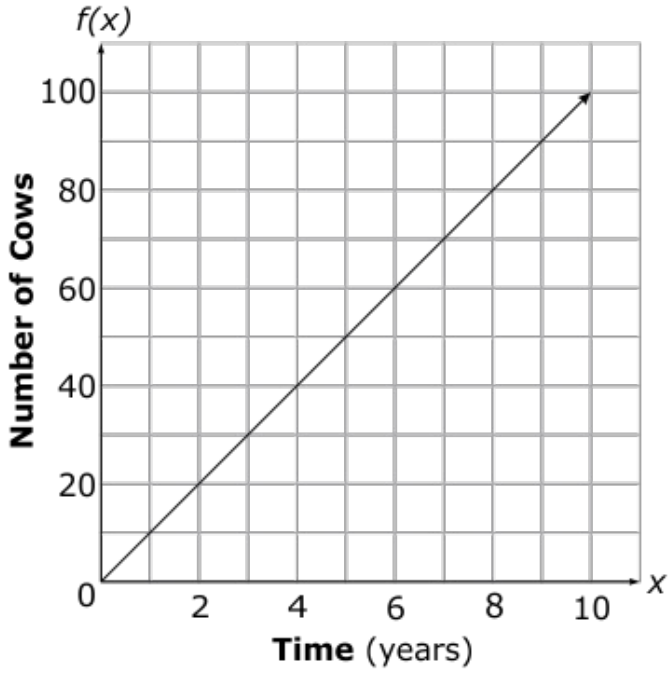
A.


f(x)
100
80
60
40
20
0
Number of Cows
2
4
6
8
10
x
Time (years)

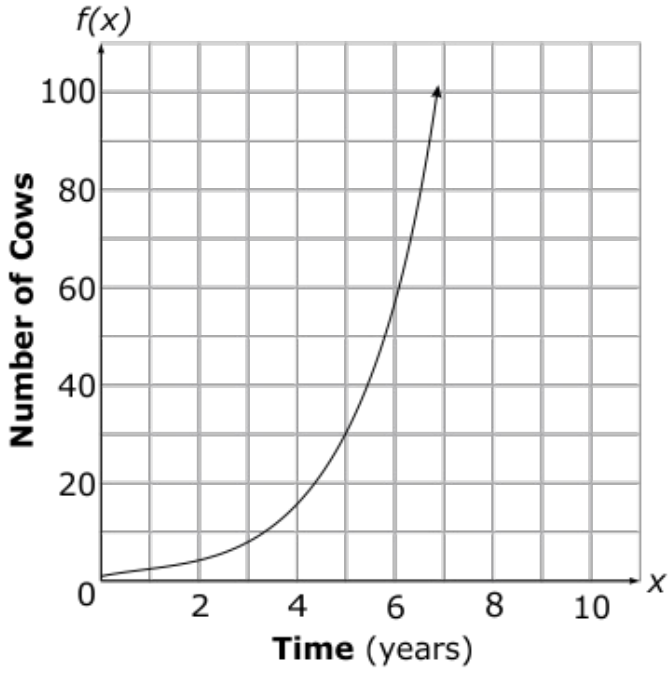
B.


f(x)
100
80
60
40
20
0
Number of Cows
2
4
6
8
10
x
Time (years)

C.



D.



151. **Which of the following functions does not have an asymptote?**

A. $y = \cos x$

B. $y = \tan x$

C. $y = \csc x$

D. $y = \cot x$

152. Which statement is true for the graph of the equation $y = 4^x$?

A. The graph has no *x*-intercept or *y*-intercept.

B. The graph intersects the *x*-axis at $(1, 0)$ but has no *y*-intercept.

C. The graph intersects the *y*-axis at $(0, 1)$ but has no *x*-intercept.

D. The graph intersects the *x*-axis at $(1, 0)$ and intersects the *y*-axis at $(0, -1)$.

153. **Upon which interval is the function $f(x) = \cos\left(\frac{1}{2}x\right)$ increasing?**

A. $0 < x < \pi$

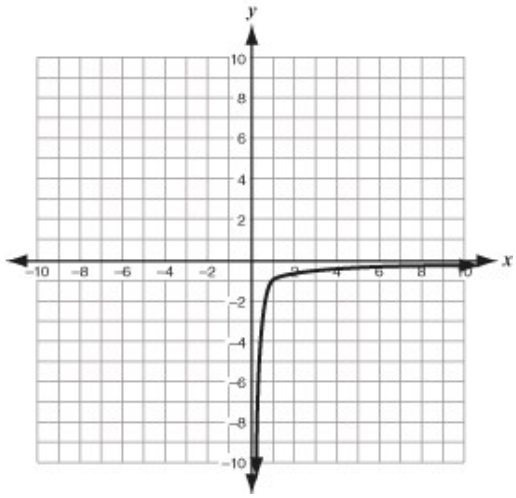
B. $0 < x < 2\pi$

C. $\pi < x < 4\pi$

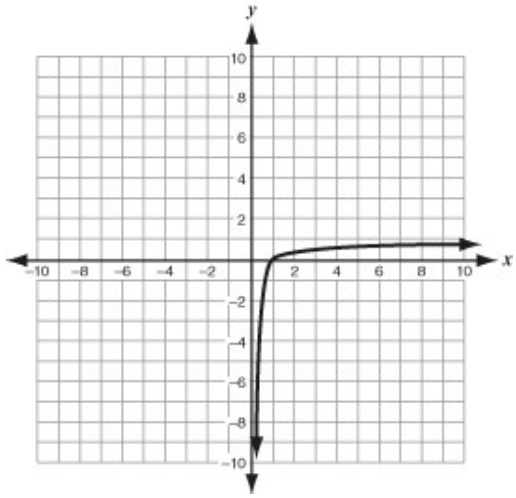
D. $2\pi < x < 4\pi$

154. Which graph **best** represents the function $f(x) = \log(x) - 1$?

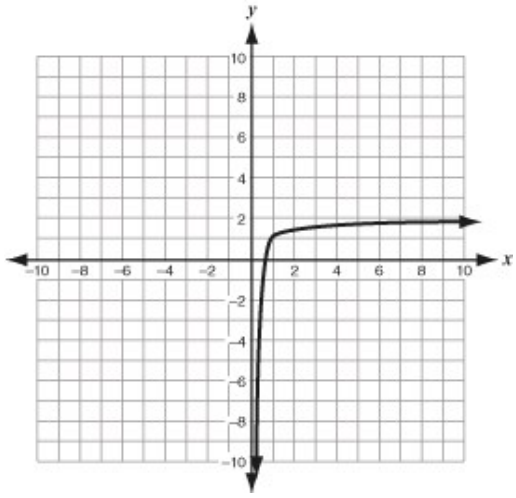
A.



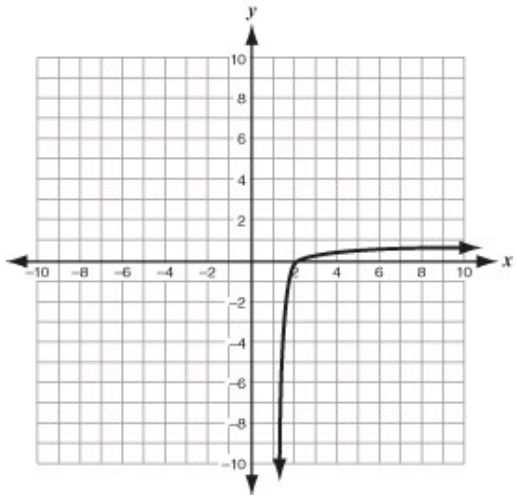
B.



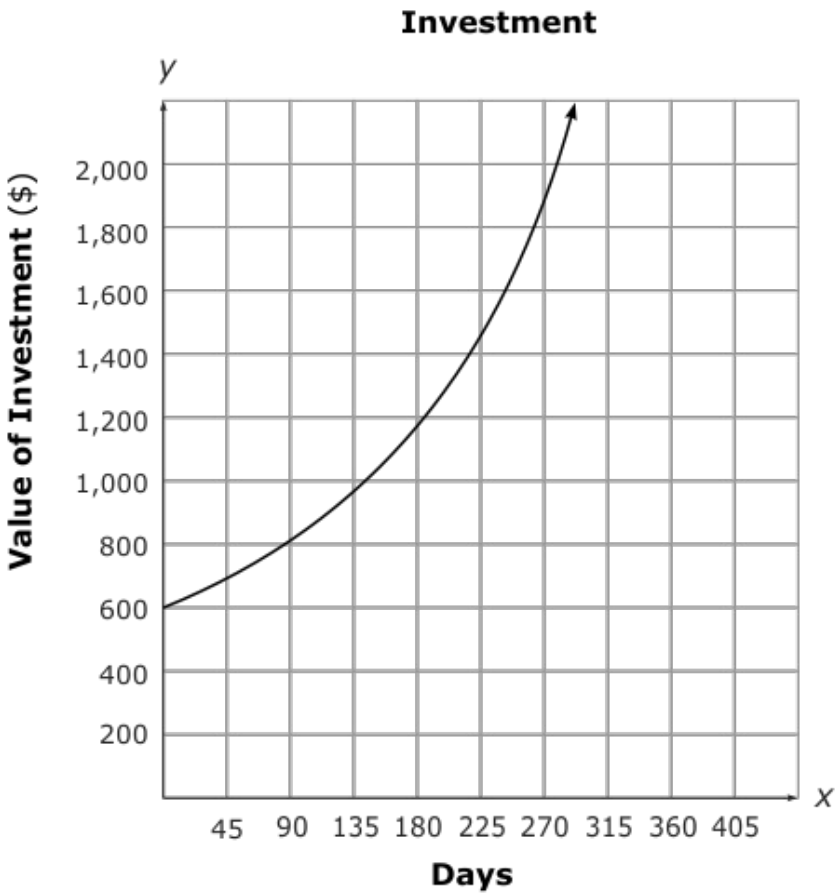
C.


y
x
10
8
6
4
2
−10
−8
−6
−4
−2
2
4
6
8
10
−2
−4
−6
−8
−10

D.


y
x
10
8
6
4
2
−10
−8
−6
−4
−2
4
6
8
10
−2
−4
−6
−8
−10

155. The graph displays how an investment, y, increases 5% every 12 days, x.



Which equation ***best*** represents the graph?

A. $y = 60(1.05)^{\frac{x}{12}}$

B. $y = 1.05(60)^{\frac{x}{12}}$

C. $y = 1.05(600)^{\frac{x}{12}}$

D. $y = 600(1.05)^{\frac{x}{12}}$