Quadratics 1

Name: _____ **Date:** _____

1. The relationship between the distance d, in feet, required to stop a vehicle and s, the speed in miles per hour that the vehicle was traveling, is given by the equation

$$d = \frac{0.0155s^2}{f}$$

where f represents the coefficient of friction between the tires and the road.

It took a car 205 feet to stop. What speed was the car traveling? Use $f = 0.3$ and round your answer to the nearest mile per hour.

2. What are the solutions to the equation $x^2 - 6x + 5 = -8$?

A. 2 and 3

B. $2i$ and $3i$

C. $3 + 2 \cdot 3$ and $3 - 2 \cdot 3$

D. $3 + 2i$ and $3 - 2i$

3. An object that is projected straight downward with initial velocity v feet per second travels a distance $s = vt + 16t^2$, where t = time in seconds. If Ramón is standing on a balcony 84 feet above the ground and throws a penny straight down with an initial velocity of 10 feet per second, in how many seconds will it reach the ground?

A. 2 seconds B. 3 seconds

C. 6 seconds D. 8 seconds

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

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

5. Which of the following sentences is true about the graphs of $y = 3(x - 5)^2 + 1$ and $y = 3(x + 5)^2 + 1$?

A. Their vertices are maximums.

B. The graphs have the same shape with different vertices.

C. The graphs have different shapes with different vertices.

D. One graph has a vertex that is a maximum, while the other graph has a vertex that is a minimum.

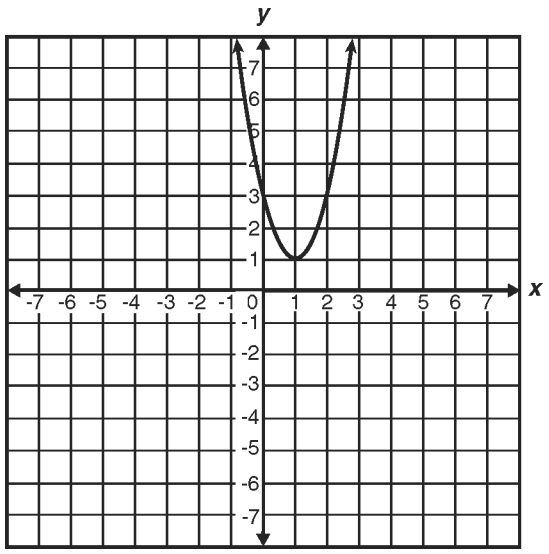
6. What are the x-intercepts of the graph of $y = 12x^2 - 5x - 2$?

A. 1 and $-\frac{1}{6}$ B. -1 and $\frac{1}{6}$

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

7. Which is the graph of $y = -2(x - 1)^2 + 1$?

A.



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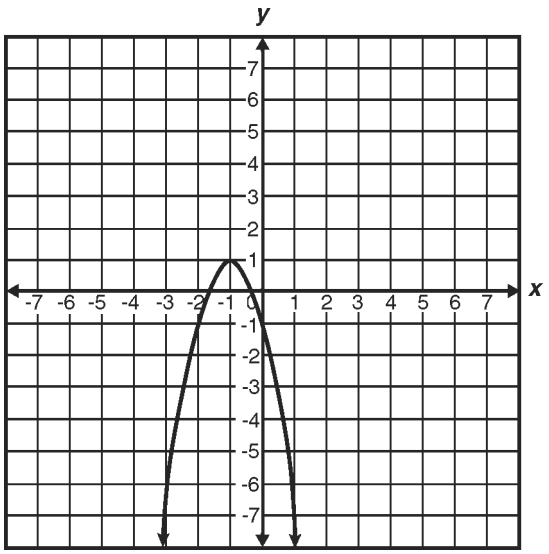

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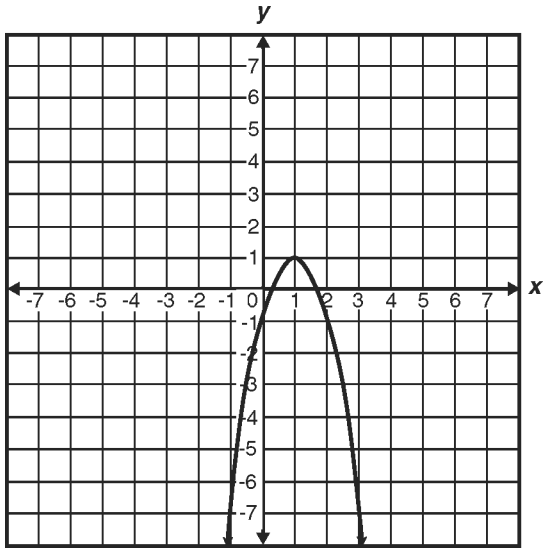

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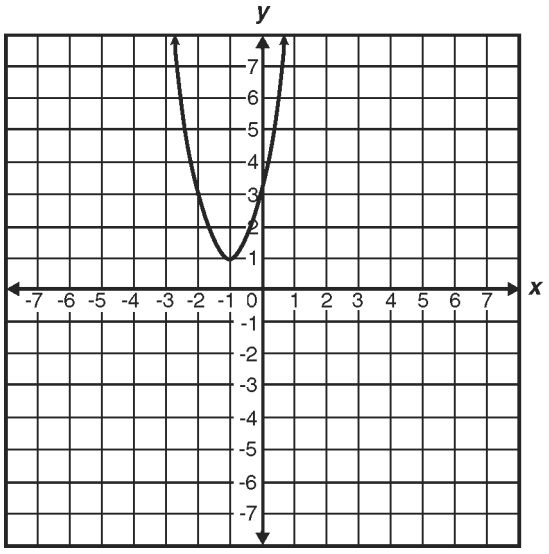


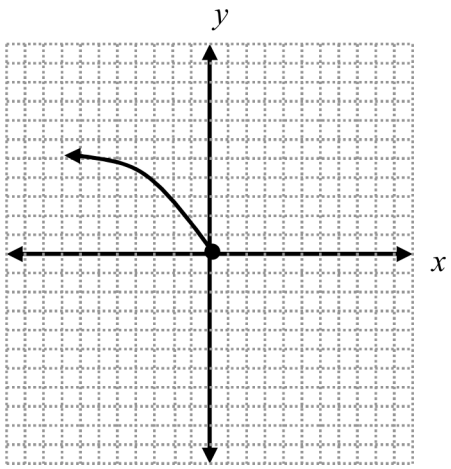
8. Which ordered pair is the vertex of $f(x) = x^2 + 6x + 5$?

A. $(-3, -4)$ B. $(-2, -3)$

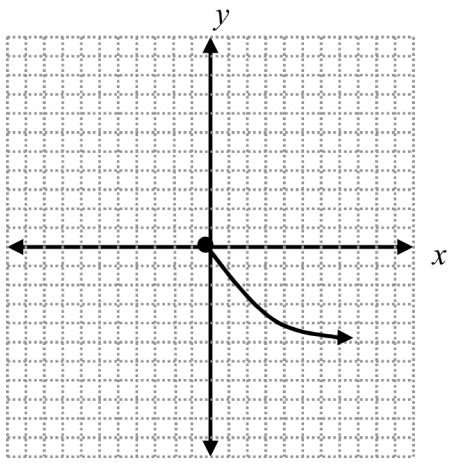
C. $(-1, 0)$ D. $(0, -5)$

9. Which of the following functions of x has the apparent range of $\{y : y \leq 0\}$?

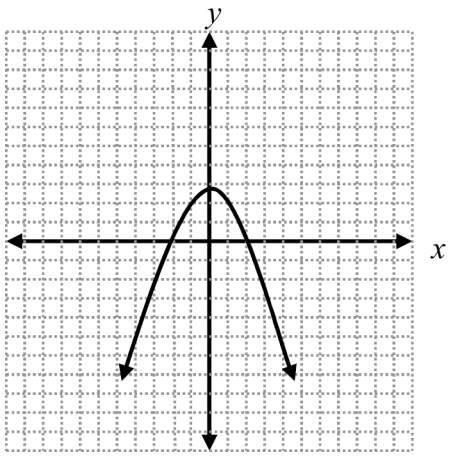
A.



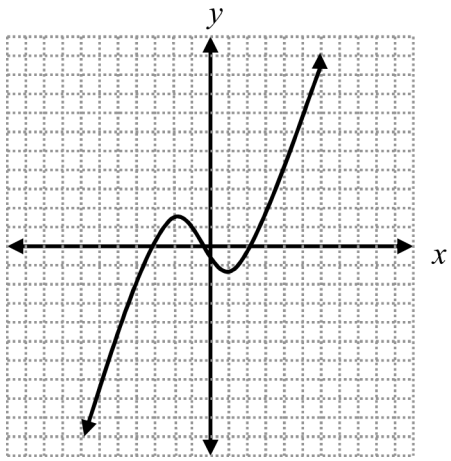
B.



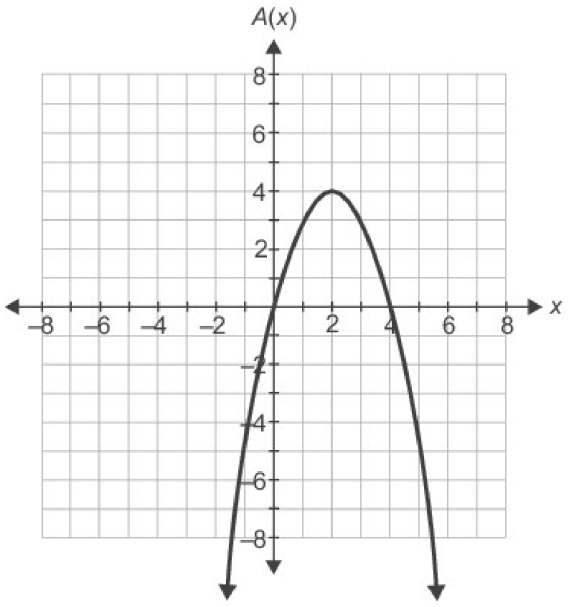
C.



D.



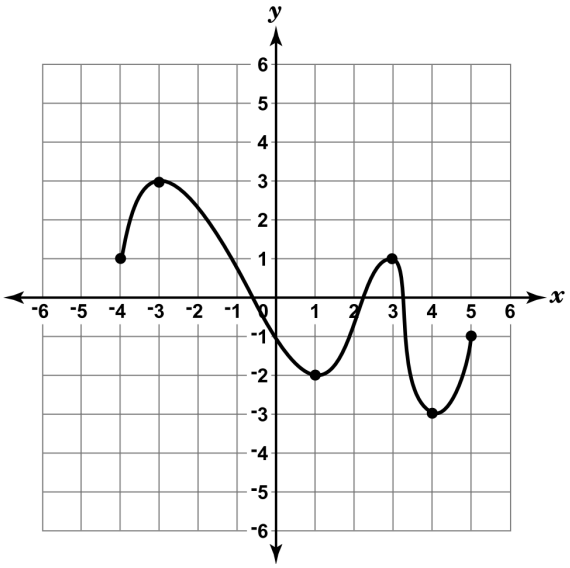
10. A rectangle has a width of $4 - x$ units and a length of x units. The area of the rectangle is represented by the function $A(x) = -x^2 + 4x$, whose graph is shown.



What is the domain of $A(x)$ in this situation?

A. All real numbers
B. $-8 < x < 4$
C. $0 \leq x < 4$
D. $0 < x < 4$

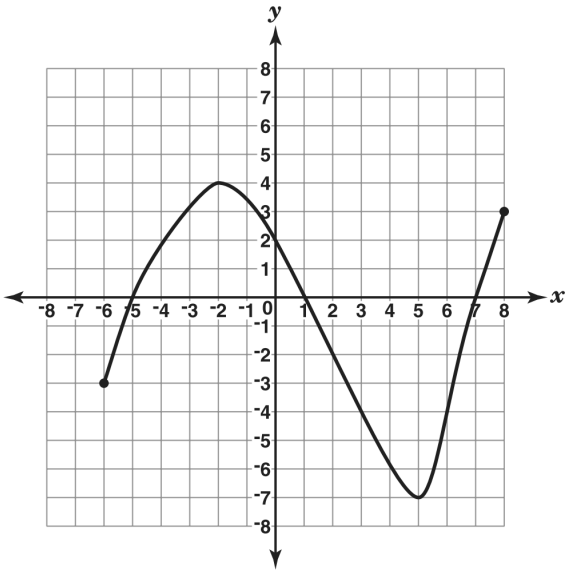
11. Look at the function that is graphed below.



What is the range of this function?

A. $-4 \leq y \leq 5$
B. $-3 \leq y \leq 3$
C. $-2 \leq y \leq 3$
D. $-4 \leq y \leq -1$

12. Look at the function that is graphed below.



What is the range of this function?

A. $-7 \leq y \leq 4$
B. $-6 \leq y \leq 8$
C. $-5 \leq y \leq 7$
D. $-2 \leq y \leq 5$

13. What is the range (all possible y-values) of the function $y = x^2 - 9$ if x is any real number?

A. all real numbers except 3

B. all real numbers except $^-3$

C. all real numbers greater than or equal to 9

D. all real numbers greater than or equal to $^-9$

14. What is the *domain* of the function

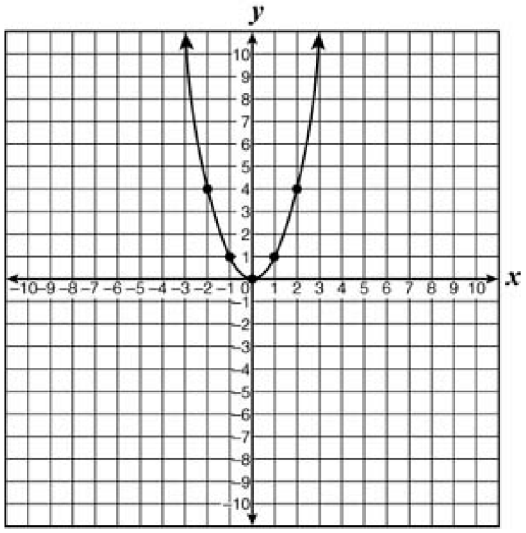
$$f(x) = 2x - 3$$

when the range is $\{-9, -3, 1\}$?

A. $\{-21, -9, -1\}$ B. $\{-2, 0, 6\}$

C. $\{-8, -2, 2\}$ D. $\{-3, 0, 2\}$

15. The equation of the function of x graphed below is $y = x^2$.



What is the range of the function?

A. {real numbers} B. $\{y : y \geq 0\}$

C. $\{y : 0 \leq y \leq 3\}$ D. $\{y : -3 \leq y \leq 3\}$

16. Marina starts to solve the quadratic equation $3x^2 + 5x - 2 = 0$.

$$\begin{aligned} 3x^2 + 5x - 2 &= 0 \\ \tfrac{3}{3}x^2 + \tfrac{5}{3}x &= \tfrac{2}{3} \\ x^2 + \tfrac{5}{3}x &= \tfrac{2}{3} \end{aligned}$$

What value should Marina add to both sides of the equation to complete the square?

A. $\left(\frac{5}{6}\right)^2$ B. $\left(\frac{5}{3}\right)^2$ C. $-\frac{2}{3}$ D. $\frac{10}{3}$

17. Each of the functions shown represents the height (in feet) of a rocket t seconds after being fired.

$$h(t) = -16(t - 5)^2 + 576$$
$$h(t) = -16(t + 1)(t - 11)$$

What is the initial height of the rocket above the ground?

A. 576 feet B. 400 feet

C. 176 feet D. 11 feet

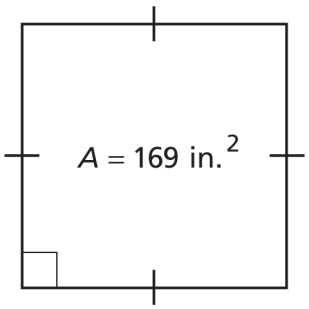
18. Pedro throws a ball upward at a rate of 20 meters per second from an initial height of 2 meters. The height of the ball above the ground can be approximated by $h = -5t^2 + 20t + 2$, where t represents the amount of time, in seconds, since the ball has been released.

What is the maximum height that the ball reaches?

A. 5 meters B. 6 meters

C. 20 meters D. 22 meters

19. The area of a square is determined using the formula $A = s^2$.



What is the length, in inches, of each side of this square?

A. 13 in.
B. 14 in.
C. 42.25 in.
D. 84.5 in.

20. Which equation is equivalent to $y = 3x^2 + 6x + 5$?

A. $y = 3(x + 3)^2 - 9$
B. $y = 3(x + 3)^2 - 4$
C. $y = 3(x + 1)^2 + 4$
D. $y = 3(x + 1)^2 + 2$

21. If $3x^2 = 48$, what is the value of x?

A. ± 4
B. ± 8
C. ± 16
D. 0 or 4

22. A ball is tossed into the air. The height of the ball as a function of time can be described by the equation $h = -16t^2 + 72t$. In this equation h is the height of the ball in feet and t is time in seconds.

After how many seconds will the ball hit the ground?

A. 4 seconds
B. 4.5 seconds
C. 9 seconds
D. 56 seconds

23. Which of the following quadratic equations is solved correctly?

A. $x^2 - 2x - 35 = 0$
$(x - 7)(x + 5) = 0$
$x = 7, x = -5$

B. $x^2 + 7x + 6 = 0$
$(x + 1)(x + 6) = 0$
$x = 1, x = 6$

C. $x^2 - 9x - 18 = 0$
$(x - 6)(x - 3) = 0$
$x = -6, x = -3$

D. $x^2 - 9x + 20 = 0$
$(x + 4)(x + 5) = 0$
$x = -4, x = -5$

24. Which is the factored form of $3a^2 - 24ab + 48b^2$?

A. $(3a - 8b)(a - 6b)$
B. $(3a - 16b)(a - 3b)$
C. $3(a - 4b)(a - 4b)$
D. $3(a - 8b)(a - 8b)$

25. Which of the following shows $9t^2 + 12t + 4$ factored completely?

A. $(3t + 2)^2$
B. $(3t + 4)(3t + 1)$
C. $(9t + 4)(t + 1)$
D. $9t^2 + 12 + 4t$

26. What is the complete factorization of $32 - 8z^2$?

A. $-8(2 + z)(2 - z)$
B. $8(2 + z)(2 - z)$
C. $-8(2 + z)^2$
D. $8(2 - z)^2$

27. If x^2 is added to x, the sum is 42. Which of the following could be the value of x?

A. -7
B. -6
C. 14
D. 42

28. Carter is solving this equation by factoring.

$$10x^2 - 25x + 15 = 0$$

Which expression could be one of his correct factors?

A. $x + 3$ B. $x - 3$ C. $2x + 3$ D. $2x - 3$

29. $25x^2 - 40xy + 16y^2$

A. $(5x - 4y)^2$ B. $(5x + 10 - 4y)^2$

C. $5(5x - 4y^2)$ D. $5(4xy)^2$

30. The Hypertech Company uses the formula

$$C = -2n^2 + 2n + 1500$$

to calculate C, the cost per computer of producing n computers. What is the greatest number of computers the company can produce for a cost per computer of \$1080?

A. 10 B. 14 C. 15 D. 21

31. The area of a rectangular lot is represented by $8b^2 - 22b - 21$. If the width of the lot is $4b + 3$, which expression represents the length?

A. $4b + 7$ B. $4b - 7$

C. $2b + 7$ D. $2b - 7$

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1.

2.
Answer: D

3.
Answer: A

4.
Answer: A

5.
Answer: B

6.
Answer: C

7.
Answer: C

8.
Answer: A

9.
Answer: B

10.
Answer: D

11.
Answer: B

12.
Answer: A

13.

14.
Answer: D

15.
Answer: B

16.
Answer: A

17.
Answer: C

18.
Answer: D

19.
Answer: A

20.
Answer: B

21.
Answer: A

22.
Answer: B

23.
Answer: A

24.
Answer: C

25.
Answer: A

26.
Answer: B

27.
Answer: A

28.
Answer: D

29.
Answer: A

30.
Answer: C

31.
Answer: D