TEST NAME: **Quadratics**
TEST ID: **2650721**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

1. **What is** $(5z + 11) - (10z + 7)$?

   A. $5z + 18$

   B. $5z + 4$

   C. $-5z + 18$

   D. $-5z + 4$

2. **Subtract** $7x^2 - 2x - 1$ **from** $5x^2 - x - 3$.

   A. $-2x^2 + x + 2$

   B. $-2x^2 - x - 2$

   C. $-2x^2 + x - 2$

   D. $2x^2 - x + 2$

3. $3(2x - 4) + 5x - (3x - 7)$ **is equivalent to which expression below?**

   A. $8x - 5$

   B. $8x - 11$

   C. $8x - 19$

   D. $14x - 19$

4. Which expression is equivalent to $(7x^2 - 5x + 1) - (x^2 - 3x - 2)$?

   A. $6x^2 - 8x - 1$

   B. $6x^2 - 8x + 3$

   C. $6x^2 - 2x - 1$

   D. $6x^2 - 2x + 3$

5. **What is the sum of** $(4d - 5) + (3d + 1)$?

   A. $7d - 4$

   B. $3d$

   C. $12d^2 - 11d - 5$

   D. $7d^2 - 4$

6. **Simplify** $(2x + 5)(2x - 5)$.

A. $(4x - 25)$

B. $(4x^2 - 10)$

C. $(4x^2 - 25)$

D. $(4x^2 - 20x - 25)$

7. **Danielle sold a certain number of tickets to the school play, *d*. Sara sold 4 more tickets to the school play than the number Danielle sold. Brett sold 3 times as many as Danielle sold. The number of tickets that the 3 students sold altogether can be represented by the expression below.**

$$d + d + 4 + 3d$$

Which is equivalent to this expression?

A. $9d$

B. $12d$

C. $3d + 4$

D. $5d + 4$

8. **What is** $(2x - 7) - (x - 9)$?

A. $x - 16$

B. $x + 2$

C. $3x - 16$

D. $3x + 2$

9. Which expression is equivalent to $(x + 6)(x - 5)$?

A. $x^2 - 30$

B. $x^2 - x - 30$

C. $x^2 + 11x - 30$

D. $x^2 + x - 30$

10. **Which polynomial is equivalent to** $(-2n+5)^2$ **?**

A. $-4n^2-20n+25$

B. $-4n^2+25$

C. $4n^2-20n+25$

D. $4n^2+25$

11. **What is the simplest form of (–4*v* + 7)(3*v* – 5)?**

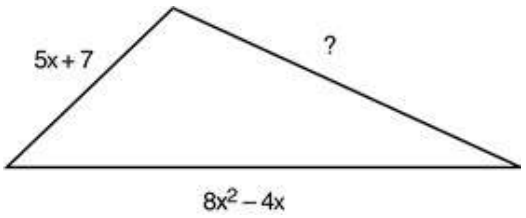
A. $-12v^2-41v-35$

B. $-12v^2-1v-35$

C. $-12v^2+1v-35$

D. $-12v^2+41v-35$

12. **The perimeter of the triangle below is** $10x^2-6x+1$.



What is the length of the missing side?

A. $2x^2-5x-8$

B. $2x^2-7x-6$

C. $8x^2+x+7$

D. $18x^2-5x+8$

13. **What is the simplest form of the expression below?**

$$(-5y^2+7)+(2y^2-2)$$

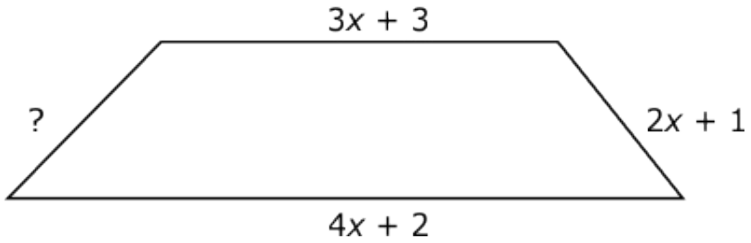
A. $2y^2$

B. $-3y^2+5$

C. $-3y^4+5$

D. $-10y^4+24y^2-14$

14. A trapezoid is shown below.



The perimeter of the trapezoid is $12x + 7$. Which expression represents the missing side length?

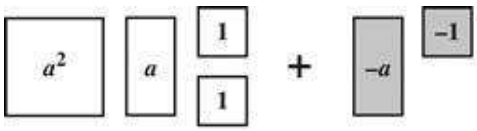
A. $4x + 1$

B. $3x + 1$

C. $2x + 5$

D. $x + 5$

15. **The sum of two polynomials is modeled below.**



What is the sum of the two polynomials?

A. $a^2 + 1$

B. $a^2 + 2a + 3$

C. $a^2 - 1$

D. $a^2 - 2a - 3$

16. Which expression is equivalent to $(z + 6)(z - 6)$?

A. $2z + 36$

B. $2z - 36$

C. $z^2 + 36$

D. $z^2 - 36$

17. **What is the product of $(h-7)$ and $(h-2)$?**

A. $2h-9$

B. h^2+14

C. $h^2-5h+14$

D. $h^2-9h+14$

18. **A rectangle has a length of x inches and a width of 2 inches less than the length. If the dimensions were doubled, what would be the area of the new rectangle in terms of x?**

A. $(2x-4)$ in.^{2}

B. $(8x-8)$ in.^{2}

C. $(2x^2-4x)$ in.^{2}

D. $(4x^2-8x)$ in.^{2}

19. **Which polynomial is equivalent to $(y+10)^2$?**

A. y^2+100

B. $y^2+20y+100$

C. $2y+20$

D. $y^2-20y+100$

20. The expression $5x^2 + 2x + 3$ represents the area of a square. The area of a rectangle is represented by $2x^2 + 3x + 1$. Which expression represents the combined area of the square and rectangle?

A. $7x^4 + 5x^2 + 4$

B. $3x^4 - x^2 + 2$

C. $7x^2 + 5x + 4$

D. $3x^2 - x + 2$

21. **The linear factors of a quadratic expression are $(x - a)$ and $(x - b)$, where a and b are constants, and $a > b > 0$. Which of the following is true about the zeros of the related quadratic function?**

A. Both zeros are positive.

B. Both zeros are negative.

C. One zero is negative, and one zero is positive.

D. There is only one zero, and it is located at the origin.

22. **Which of the following functions describes a graph that will intersect the *x*-axis in exactly one point?**

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

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

C. $y = x^2 - x - 6$

D. $y = x^2 - 6x + 9$

23. **The factored form of a quadratic expression is $(x + a)(x + b)$, where a and b represent positive constants. Which statement describes how to determine one zero of the related quadratic function?**

A. Find the sum of the two constants.

B. Find the opposite of one of the constants.

C. Find the difference between the two constants.

D. Find the ratio of the smaller to the larger constant.

24. Marlene wants to know the height of a nearby tree. The tree is casting a shadow that is 13 feet long. Marlene places a yardstick perpendicular to the ground. The yardstick casts a shadow that is 2 feet long. To the nearest tenth of a foot, what is the height of the tree?

A. 6.5 feet

B. 8.7 feet

C. 11.7 feet

D. 19.5 feet

25. **The zeros of a quadratic function are located at (3, 0) and (–4, 0). Which product shows the linear factors of this function's equation?**

A. $(x + 3)(x - 4)$

B. $(x - 3)(x + 4)$

C. $(x - 3)(x - 4)$

D. $(x + 3)(x + 4)$

26. Kim receives $200 from a contest. She invests half of the winnings at a 9% annual interest rate. She leaves the other half in a money jar at home and adds a $1 to the jar each month. After ***approximately*** how many years will Kim's investment and her money jar savings be worth the same amount of money?

A. 12 years

B. 9 years

C. 7 years

D. 4 years

27. Two functions are shown below.

$$f(x) = 4^x + 2$$
$$g(x) = {}^{-}3x + 9$$

What is the value of x when $f(x) = g(x)$?

A. 1

B. 3

C. 4

D. 6

28. Two functions are shown below.

$$f(x)=2x+1 \qquad g(x)=-72x-5$$

What is the ***approximate*** value of x when $f(x) = g(x)$?

A. 1.3

B. 0.5

C. $^{-}1.8$

D. $^{-}3.1$

29. Two functions are shown below.

$$f(x) = 5 - x$$
$$g(x) = 2x + 2$$

Which statement justifies that $f(x) = g(x)$ when $x = 1$?

A. $f(1) - g(1) = 4$

B. $f(1) - g(1) = 0$

C. $f(1) + g(1) = 4$

D. $f(1) + g(1) = 0$

30. A system of equations is shown below.

$$4x + y = 16$$
$$y = 2^{x-1}$$

For what value of x are the two functions equal?

A. 2

B. 3

C. 4

D. 5

31. Two functions are shown below.

$$f(x) = 2^x$$
$$g(x) = x + 5$$

What is the largest value of x for which $f(x) = g(x)$?

A. 0

B. 3

C. 5

D. 8

32. **For what values of t does $(6+t)(1-t)=10$?**

A. -9 and 4

B. -6 and 1

C. -4 and -1

D. 2 and 3

33. **What are the solutions to the equation $x^2-7x-30=0$?**

A. $x=-3$ or $x=-10$

B. $x=-3$ or $x=10$

C. $x=3$ or $x=-10$

D. $x=3$ or $x=10$

34. **Using factoring, what is the solution set to the equation $t^2-7t+12=0$?**

A. $\{-3,-4\}$

B. $\{-2,-6\}$

C. $\{3,4\}$

D. $\{5,7\}$

35. **What are the solutions for x in the equation $x^2-102x+200=0$?**

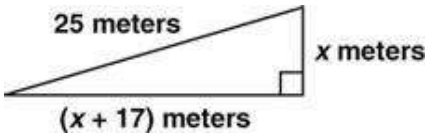
A. 2 or 100

B. 4 or 50

C. 8 or 25

D. 10 or 20

36. **What is the length, in meters, of the shortest side of the right triangle below?**



A. 4

B. 7

C. 17

D. 24

37. **A quadratic equation is given below.**

$$(x+6)^2 = 13$$

What are the solutions to the equation?

A. $x = \sqrt{7}$ and $x = -\sqrt{7}$

B. $x = \sqrt{19}$ and $x = -\sqrt{19}$

C. $x = 6+\sqrt{13}$ and $x = 6-\sqrt{13}$

D. $x = -6+\sqrt{13}$ and $x = -6-\sqrt{13}$

38. **What is the solution set for the equation** $x^2 - 9 = 0$?

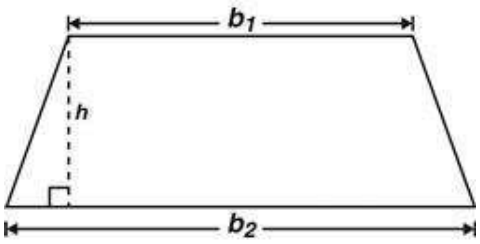
A. $\{3\}$

B. $\{9\}$

C. $\{-3, 3\}$

D. $\{-9, 9\}$

39. **The area of the trapezoid below can be found by the formula** $A = \frac{1}{2}h(b_1 + b_2)$.



The area of this trapezoid is 30 square inches. If $b_1 = h$ **and** $b_2 = h+7$**, what is the length of** ***h*** **in inches?**

A. 4

B. 11

C. 15

D. 26.5

40. **An object fell to the ground from a height of 288 feet. The equation $0 = 288 - 48t - 16t^2$ can be used to determine *t*, the time in seconds it took for the object to hit the ground. At what time did the object hit the ground?**

A. 2 seconds

B. 3 seconds

C. 6 seconds

D. 9 seconds

41. **Which value of *x* is a solution to the equation** $x^2 - 12x + 36 = 0$?

A. $x = -6$

B. $x = -3$

C. $x = 3$

D. $x = 6$

42. Maria purchased a book at a discount. The discounted price of the book is modeled by the equation $a = b = xb$. What do *a*, *b*, and *x* most likely represent in this equation?

A. *a* = amount Maria paid; *b* = original cost of the book; *x* = discount percentage

B. *a* = original cost of the book; *b* = amount Maria paid; *x* = discount percentage

C. *a* = amount Maria paid; *b* = original cost of the book; *x* = total discount on the book

D. *a* = original cost of the book; *b* = amount Maria paid; *x* = total discount on the book

43. A theater sells t tickets at a price of p dollars each. The theater conducts a survey and predicts that if the price of each ticket is changed by $2, the number of tickets sold will change by 15 tickets. If n is the number of times the theater changes the ticket price by $2, the expression $(p + 2n)(t - 15n)$ can represent the theater's total revenue, in dollars. In this expression, what does $(t - 15n)$ represent?

A. the number of tickets the theater will sell if the ticket price is increased by $2

B. the number of tickets the theater will sell if the ticket price is increased by $2*n*

C. the number of tickets the theater will sell if the ticket price is decreased by $15

D. the number of tickets the theater will sell if the ticket price is decreased by $15*n*

44. Which is a zero of the function defined by $2x^2 + x - 45$?

A. $^{-}9$

B. $^{-}5$

C. 5

D. 9

45. What is the sum of the roots of the expression $4x^2 + 11x - 3$?

A. $^{-}2.75$

B. $^{-}0.25$

C. 0.25

D. 2.75

46. What are the zeros of the function defined by $y = 6x^2 + 10x - 4$?

A. $^{-}2, ^{-}\frac{1}{3}$

B. $^{-}2, \frac{1}{3}$

C. $2, ^{-}\frac{1}{3}$

D. $2, \frac{1}{3}$

47. **The solutions to a quadratic equation are 6 and $\frac{2}{3}$. Which quadratic function is related to this equation?**

A. $y = 2x^2 + 9x - 18$

B. $y = 2x^2 - 15x + 18$

C. $y = 3x^2 - 20x + 12$

D. $y = 3x^2 + 16x - 12$

48. **What is the correct way to write the expression below as the difference of squares?**

$$x^2 - 225$$

A. $(x - 9)(x - 25)$

B. $(x - 9)(x + 25)$

C. $(x - 15)(x + 15)$

D. $(x - 15)(x - 15)$

49. What are the zeros of the function defined by $x^2 - 5x - 24$?

A. $^-8, ^-3$

B. $^-8, 3$

C. $^-3, 8$

D. $3, 8$

50. Which is a zero of the function defined by $2x^2 + 5x - 3$?

A. $-\frac{3}{2}$

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. $\frac{3}{2}$

51. Which expression has zeros at $^-3$ and $^-2$?

A. $x^2 + 5x + 6$

B. $x^2 - 5x + 6$

C. $x^2 - x + 6$

D. $x^2 - x - 6$

52. **The graph of $y = x^2 + 2x$ crosses the *x*-axis at**

A. $x = 0$ only.

B. $x = -2$ only.

C. $x = 0$ and $x = 2$.

D. $x = 0$ and $x = -2$.

53. What are the zeros of the function defined by $6x^2 + 7x - 5$?

A. $\frac{1}{3}, -\frac{5}{2}$

B. $-\frac{1}{3}, \frac{5}{2}$

C. $\frac{5}{3}, -\frac{1}{2}$

D. $-\frac{5}{3}, \frac{1}{2}$

54. **Which expression is equivalent to $x^2 + 4x - 12$?**

A. $(x + 6)(x - 2)$

B. $(x + 4)(x - 3)$

C. $(x + 3)(x - 4)$

D. $(x + 2)(x - 6)$

55. **If possible, factor the binomial as a difference of squares.**

$$4x^2 + 25$$

A. $(2x + 5)(2x + 5)$

B. $(2x + 5)(2x - 5)$

C. $(2x - 5)(2x - 5)$

D. It cannot be factored.

56. Which is a zero of the function defined by $5(x^2 - 3x + 6) - (8x + 4)$?

A. $^{-}5$

B. $^{-}2$

C. $\frac{2}{5}$

D. $\frac{13}{5}$

57. What is the value of the larger zero of the function defined by $x^2 + 12x + 27$?

A. 9

B. 3

C. $^{-}3$

D. $^{-}9$

58. **Which of the following is equivalent to** $4x^2 - 12x + 9$?

A. $(2x - 3)^2$

B. $(2x + 3)^2$

C. $(-2x - 3)^2$

D. $(2x + 3)(2x - 3)$

59. Jessica graphed a quadratic function that has a vertex of ($^{-}0.5$, $^{-}4.5$) and zeros of $^{-}2$ and 1. Which is the function that Jessica graphed?

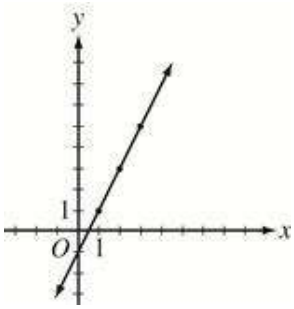
A. $y = {}^{-}2x^2 + 2x + 4$

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

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

D. $y = 2x^2 + 2x - 4$

60. **Which of the following tables lists the coordinates of the three points indicated on the line graphed below?**



A.

x	1	2	3
y	1	2	3

B.

x	1	2	3
y	1	3	5

C.

x	1	3	5
y	1	3	5

D.

x	1	3	5
y	1	2	3

61. **What are the *x*- and *y*-intercepts for the graph of the equation** $y = 6 - 3x$?

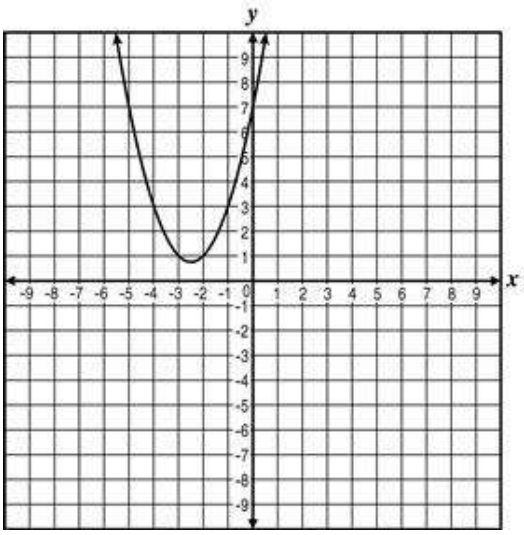
A. x-intercept = 6; y-intercept = −2

B. x-intercept = −2; y-intercept = 6

C. x-intercept = 2; y-intercept = 6

D. x-intercept = 6; y-intercept = 2

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



A.

x	y
1	–2
3	–1
7	0
–4	3

B.

x	y
0	7
1	3
2	1
4	3

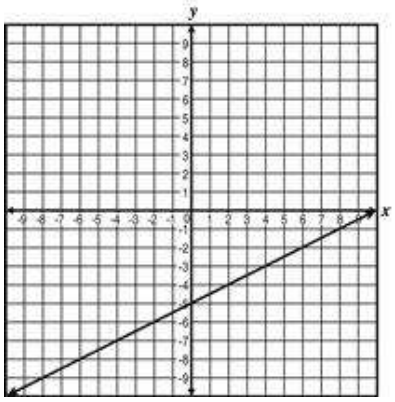
C.

x	y
–2	1
0	7
–4	3
–3	1

D.

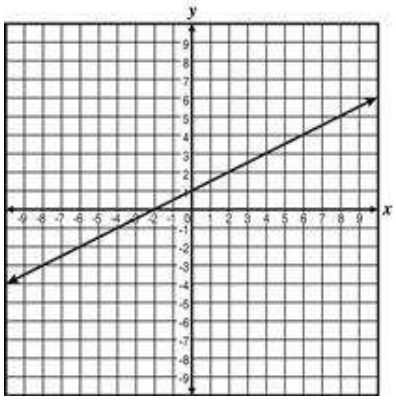
x	y
–3	4
–2	1
0	7
4	–3

63. **The graph of** $y = \frac{1}{2}x - 5$ **is shown below.**

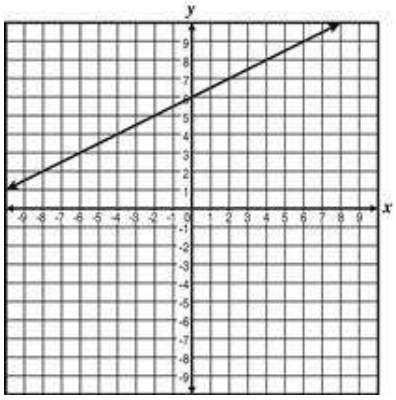


Which figure represents the new graph if −5 is changed to 6?

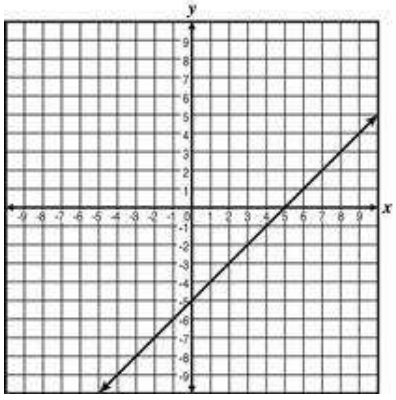
A.



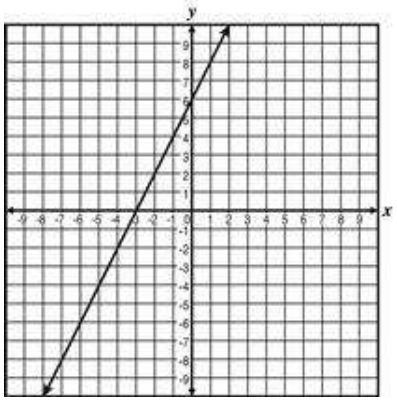
B.



C.

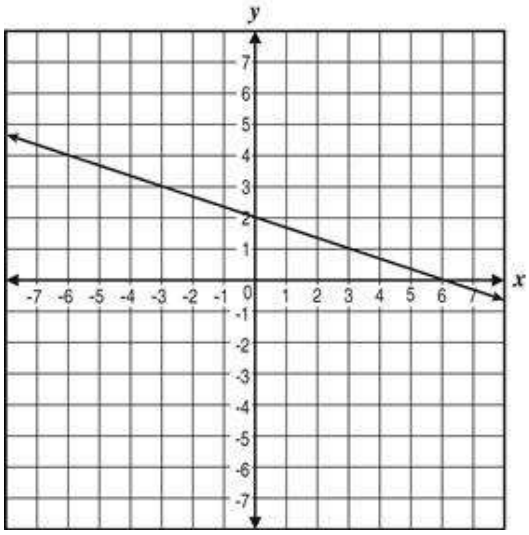


D.

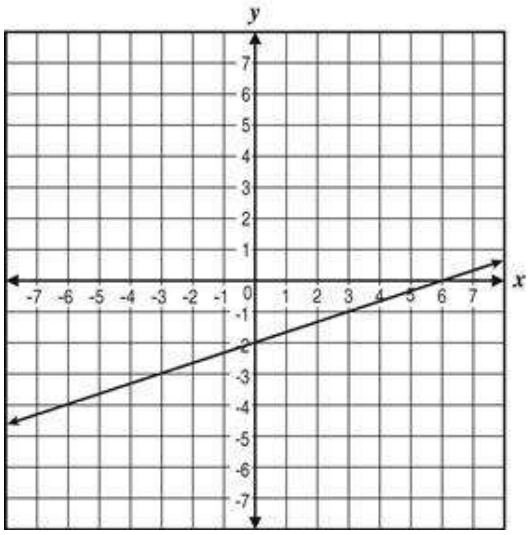


64. **Which of the following is the graph** $x - 3y = -6$?

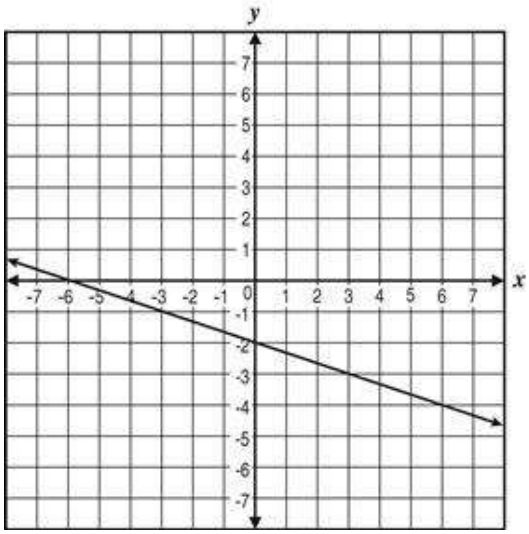
A.



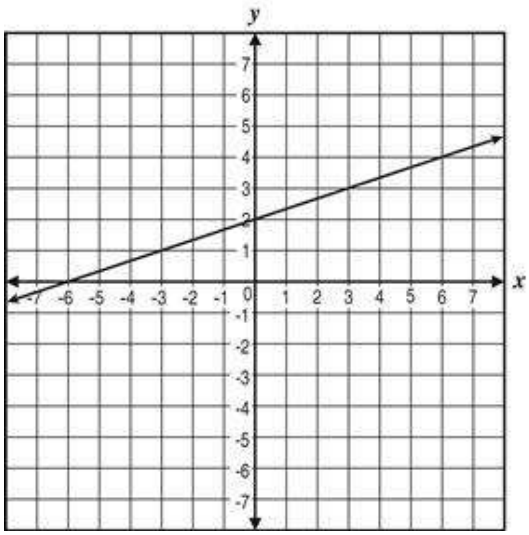
B.



C.



D.



65. **What point is the *y*-intercept of the line represented by the equation** $4x + 5y = 20$?

A. (0, 4)

B. (0, 5)

C. (4, 0)

D. (5, 0)

66. 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.

67. **Look at the equation below.**

$$y = -Ax + 6$$

For what value of *A* will the graph of the equation have an *x*-intercept at (2, 0)?

A. 6

B. 4

C. 3

D. 2

68. **Which equation represents the relationship between *x* and *y* in the table?**

x	*y*
1	2
2	5
3	10
4	17

A. $y = x + 1$

B. $y = 2x + 1$

C. $y = x^2 + 1$

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

69. **What are the *x*- and *y*-intercepts of the graph of $7y - \frac{1}{2}x = 14$?**

A. x-intercept $= -2$; y-intercept $= 28$

B. x-intercept $= 2$; y-intercept $= -28$

C. x-intercept $= 28$; y-intercept $= -2$

D. x-intercept $= -28$; y-intercept $= 2$

70. **What is the *x*-intercept of the line given by** $2x + 3y = 6$ **?**

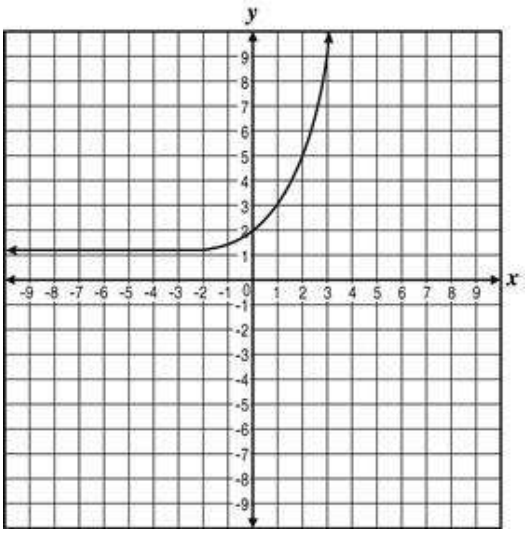
A. $(3, 0)$

B. $(2, 0)$

C. $(0, 3)$

D. $(0, 2)$

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



A. $y = 2x + 1$

B. $y = 2^x + 1$

C. $y = x^2 + 1$

D. $y = x^3 + 1$

72. **What are the *x*- and *y*-intercepts of the graph of** $4y - \frac{1}{2}x = 12$ **?**

A. x-intercept $= 24$; y-intercept $= -3$

B. x-intercept $= -24$; y-intercept $= 3$

C. x-intercept $= 3$; y-intercept $= -24$

D. x-intercept $= -3$; y-intercept $= 24$

73. **Look at the equation below.**

$$y = Ax + 6$$

For which value of A will the graph of the equation have an x-intercept of 4?

A. $-\frac{3}{2}$

B. $-\frac{2}{3}$

C. 4

D. 6

74. **What is the y-intercept of the line whose equation is** $5x + 2y = 10$ **?**

A. -5

B. $-\frac{5}{2}$

C. $\frac{5}{2}$

D. 5

75. **Look at the equation below.**

$$y = -Ax + 5$$

For what value of A will the graph of the equation have an x-intercept of 3?

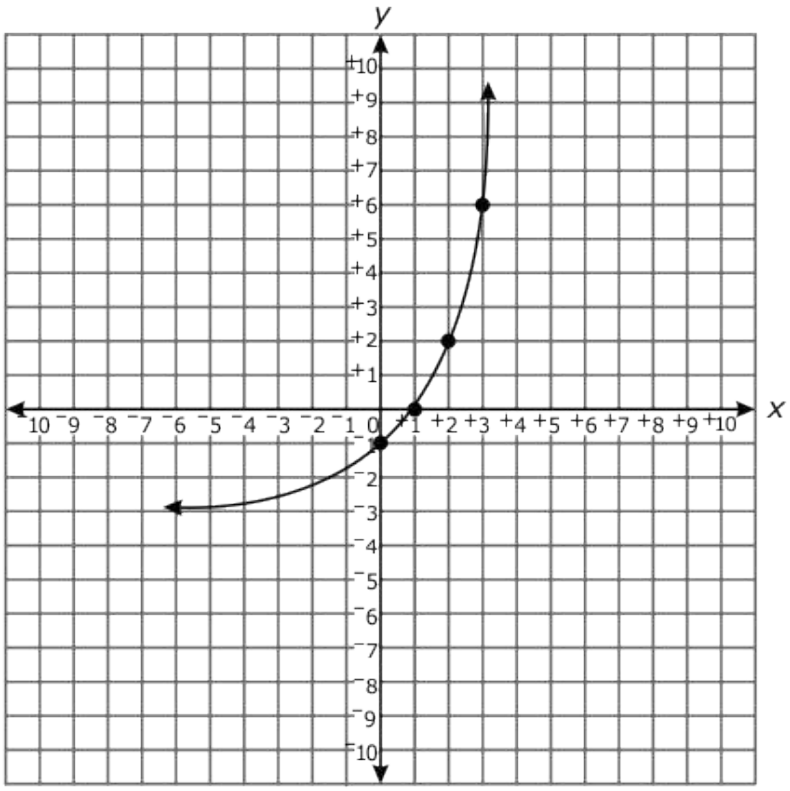
A. $-\frac{5}{3}$

B. $\frac{5}{3}$

C. 3

D. 5

76. Which function is graphed below?



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

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

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

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

77. 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

78. **What are the *x*- and *y*-intercepts for** $-2x + 3y = -12$?

A. x-intercept $= -6$; y-intercept $= 4$

B. x-intercept $= -4$; y-intercept $= 6$

C. x-intercept $= 4$; y-intercept $= -6$

D. x-intercept $= 6$; y-intercept $= -4$

79. **Look at the equation below.**

$$y = -Ax + 9$$

For which value of A will the graph of the equation have an x-intercept of $\frac{9}{2}$?

A. $-\frac{9}{2}$

B. 2

C. $\frac{9}{2}$

D. 9

80. **What point is the *x*-intercept of the line represented by the equation $5x + 3y = 15$?**

A. $(5, 0)$
B. $(3, 0)$
C. $(0, 5)$
D. $(0, 3)$

81. **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

82. **Which equation represents the line with an *x*-intercept of -5 and a *y*-intercept of 2 ?**

A. $y = \frac{2}{5}(x - 2)$
B. $y = \frac{2}{5}(x + 5)$
C. $y - 2 = \frac{2}{5}(x + 5)$
D. $y + 5 = \frac{2}{5}(x - 2)$

83. **Look at the equation below.**

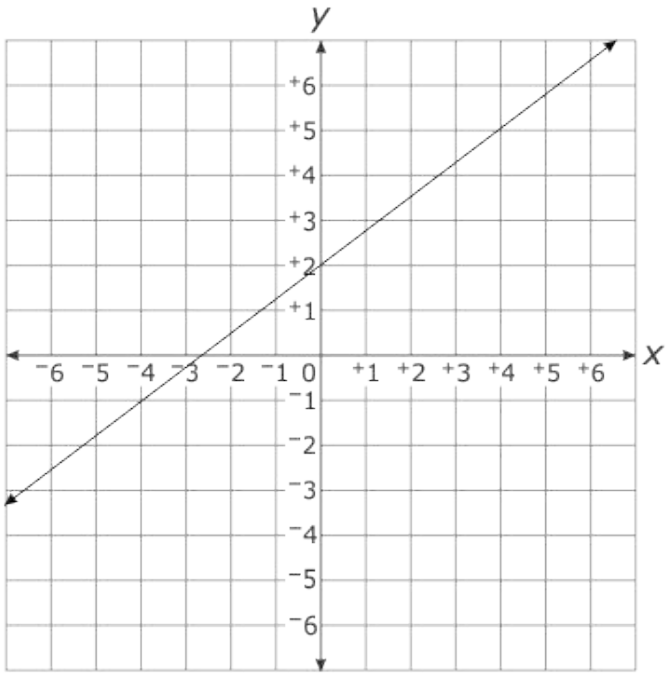
$$y = -Ax + 8$$

For what value of *A* will the graph of the equation have an *x*-intercept of 2?

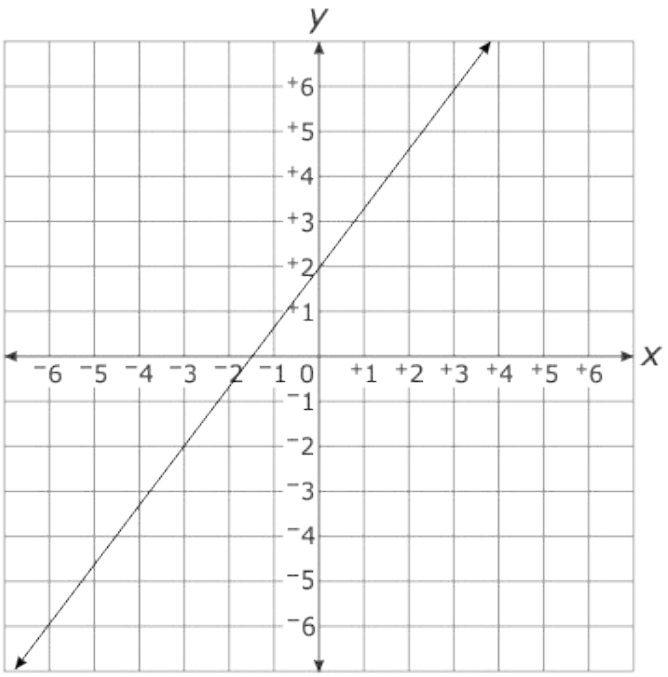
A. 2
B. 4
C. 6
D. 8

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

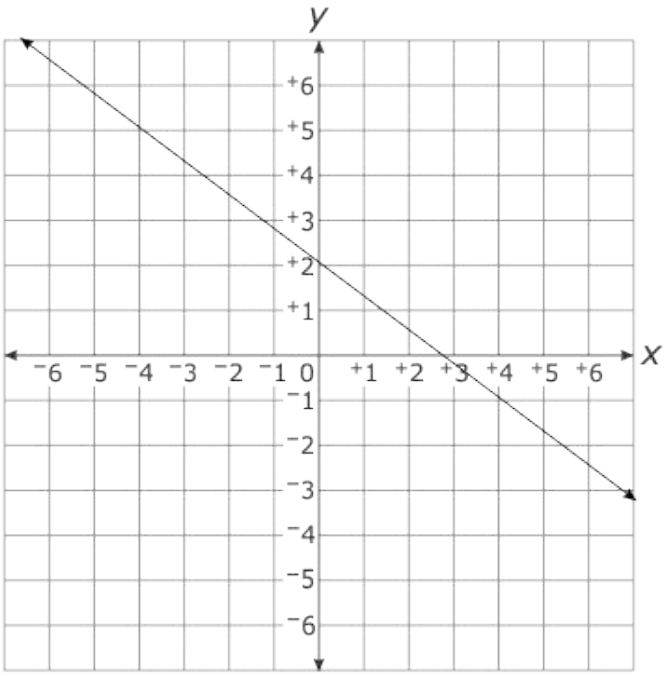
A.


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

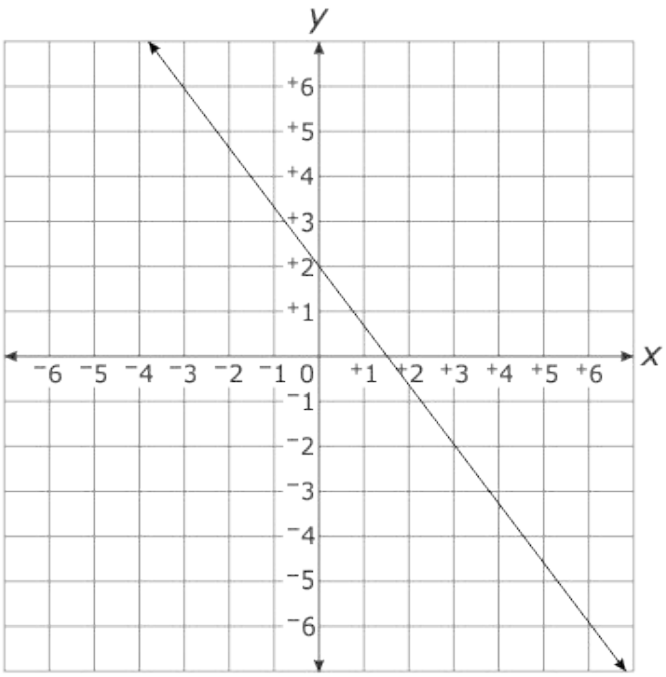
B.


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.



85. Which is the equation for the axis of symmetry of $y = x^2 - 4x - 12$?

A. $x = 4$

B. $x = 2$

C. $x = {}^{-}4$

D. $x = {}^{-}6$

86. **What is the number of *x*-intercepts of the graph of the function** $y = x^2 + x - 12$?

A. 0
B. 1
C. 2
D. 12

87. **A company's profit is described by the equation** $P(x) = -5x^2 + 300x + 15{,}000$, **where *x* is the price in dollars that the company charges for its product. What should the company charge for the product to generate the maximum profit?**

A. $20
B. $30
C. $50
D. $60

88. The height of a ball kicked into the air can be modeled with the function $g(x) = -16x^2 + 72x$, where x is time in seconds. How long does it take for the ball to hit the ground?

A. 2.25 seconds
B. 3 seconds
C. 4.5 seconds
D. 5 seconds

89. Which is an equation of the axis of symmetry of the function $f(x) = 4x^2 + 32x + 64$?

A. $x = -16$
B. $x = -4$
C. $x = 4$
D. $x = 16$

90. The length of a rectangle is twice as long as its width. If the width of the rectangle is increased by 3 units and the length is unchanged, which equation represents the area, A, of the new rectangle in terms of its width, w?

A. $A = 2w^2 + 6w$

B. $A = 2w^2 + 3w$

C. $A = 2w^2 + 6$

D. $A = 2w^2 + 3$

91. **How many times does the graph of the quadratic function $f(x) = (x - 6)^2$ intersect the x-axis?**

A. 0

B. 1

C. 2

D. 6

92. Jason compared the function $f(x) = 20(1.2)^x$ to the function that fits the values in the table below.

x	1	2	3	4	5
$g(x)$	12	24	48	96	192

What is the distance between the y-intercepts of the two functions?

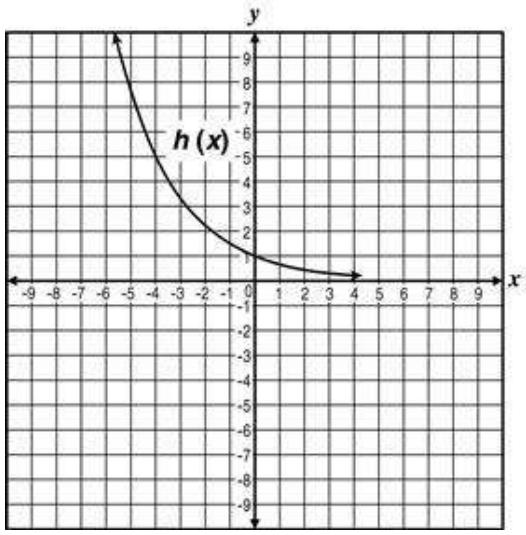
A. 14

B. 8

C. 6

D. 4

93. **Exponential function *g* is defined as $g(x) = \left(\frac{3}{2}\right)^x$, and exponential function *h* is graphed below.**



Which statement about the graphs of the two functions is NOT true?

A. $g(x) = h(-x)$

B. Both functions are always decreasing.

C. Both functions have the same *y*-intercept.

D. The values of both functions are always positive.

94. Some values of a quadratic function are shown in the table below.

x	*f*(*x*)
1	⁻20
2	⁻20
3	⁻18
4	⁻14

Which function has a zero that is 2 times the value of the positive zero of $f(x)$?

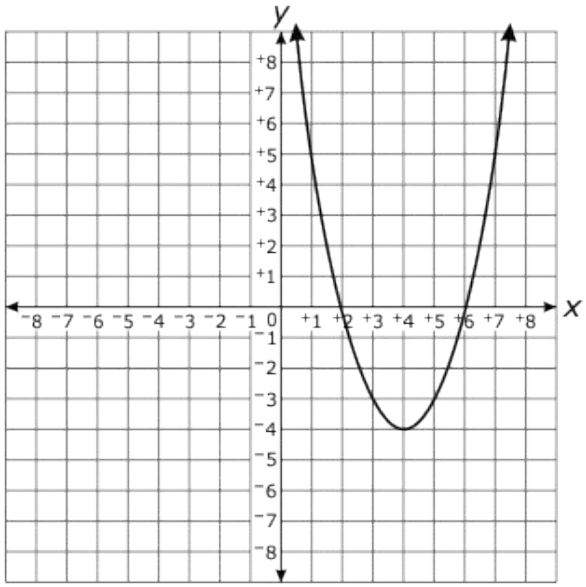
A. $g(x) = x^2 - 36$

B. $g(x) = x^2 - 9$

C. $g(x) = x^2 - 9x - 36$

D. $g(x) = 2x^2 - 9x - 18$

95. What is the difference between the minimum value of $f(x) = x^2 - 2x + 3$ and the minimum value of the function graphed below?



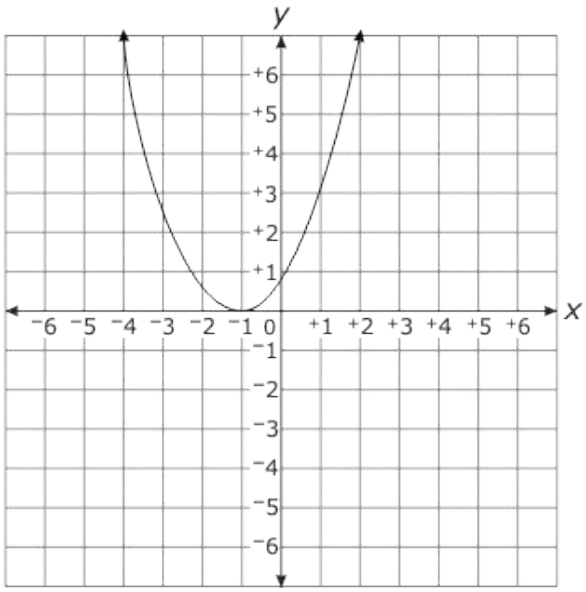
A. 1

B. 3

C. 6

D. 8

96. Jenna compared the minimum of the function, $f(x) = x^2 + 2x + 4$ to the minimum of the function graphed below.



What is the difference between the minimum values of the two functions?

A. 2

B. 3

C. 4

D. 5

97. **Which set of ordered pairs represents a function?**

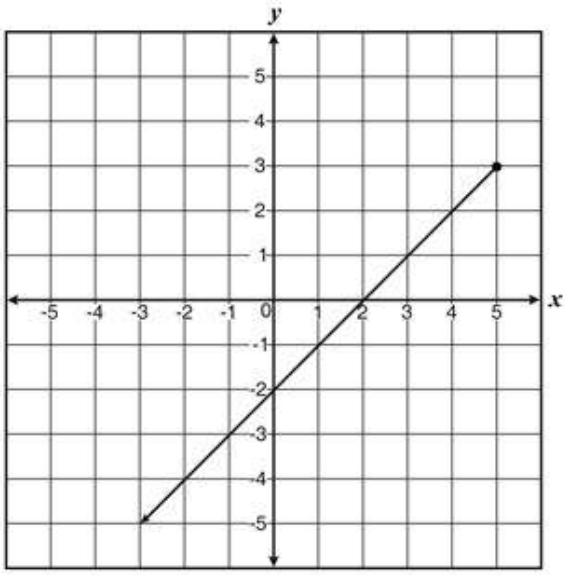
A. {(3, 2), (4, 4), (6, 3), (4, 5)}

B. {(4, –3), (4, –1), (4, 3), (4, 6)}

C. {(–4, 4), (–2, 4), (1, 4), (5, 4)}

D. {(–3, –3), (–2, –4), (–2, –1), (–1, –5)}

98. **Which statement about the following graph is NOT true?**



A. The range values are less than or equal to 3.

B. The domain values are less than or equal to 5.

C. Both the domain and range values are infinite.

D. The domain and range values include all real numbers.

99. **What is the range of the function** $y = 3x + 2$ **for the domain** $2 \leq x \leq 6$**?**

A. $0 \leq y \leq \frac{4}{3}$

B. $\frac{2}{3} \leq y \leq 2$

C. $6 \leq y \leq 18$

D. $8 \leq y \leq 20$

100. **Which number is NOT an element in the range of the equation** $y = 2x^2 - 6$ **for the domain of** $\{-3, 5, 6\}$?

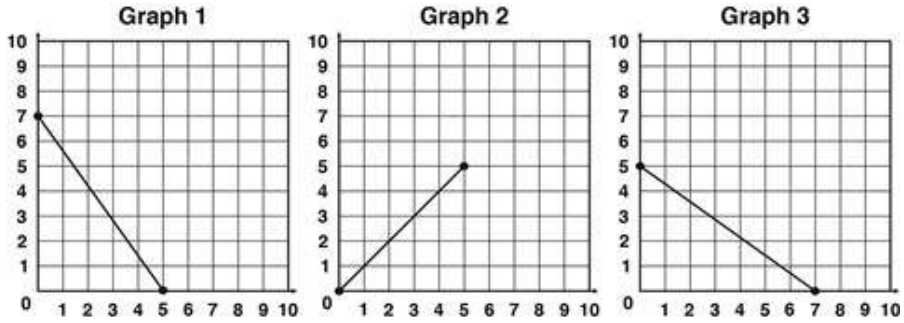
A. 12

B. 30

C. 44

D. 66

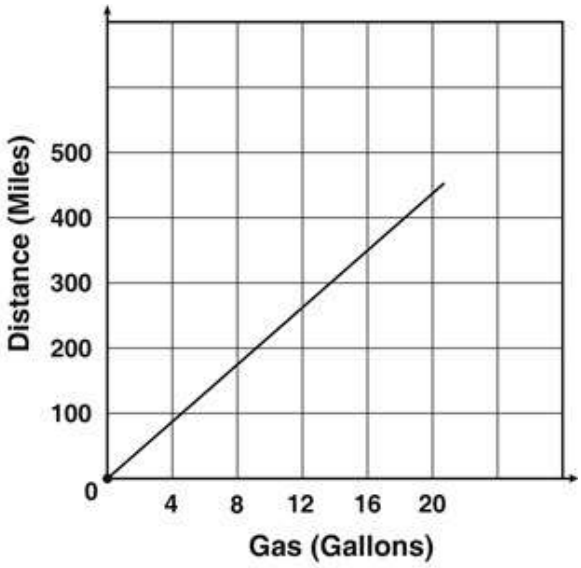
101. **Examine the three graphs shown below.**



Which graphs have same domain?

A. Graphs 1 and 2
B. Graphs 1 and 3
C. Graphs 2 and 3
D. Graphs 1, 2, and 3

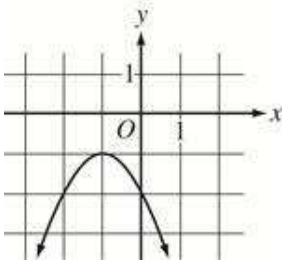
102. **The following graph shows the functional relationship between the distance a car travels and the amount of gas it consumes. The car is able to travel 22 miles per gallon of gas.**



If the maximum amount the gas tank can hold is 19 gallons, what is the range of this function with a full tank of gas?

A. The range is less than 19.
B. The range is less than 418.
C. The range is between 0 and 19 inclusive.
D. The range is between 0 and 418 inclusive.

103. **What is the range of the function in the graph below?**



A. $y \leq 0$

B. $y \leq -1$

C. $y \leq -2$

D. all real numbers

104. **What is the domain for** $f(x) = x^2 - 10x + 24$?

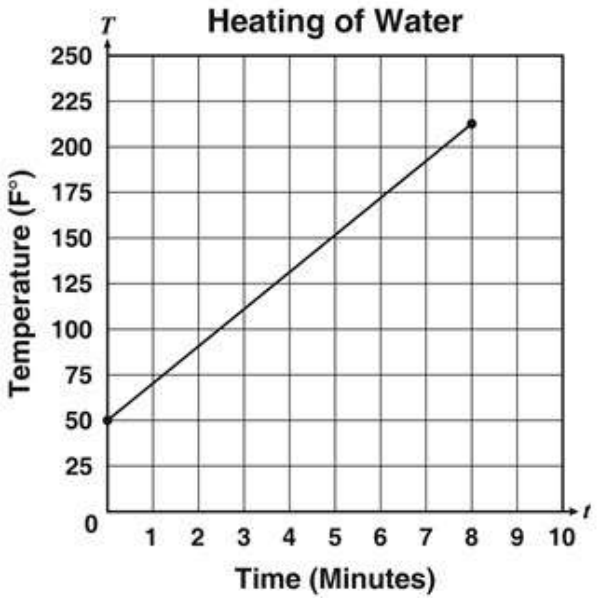
A. all real numbers

B. all real numbers greater than or equal to –1

C. all real numbers greater than or equal to 5

D. all real numbers greater than or equal to 24

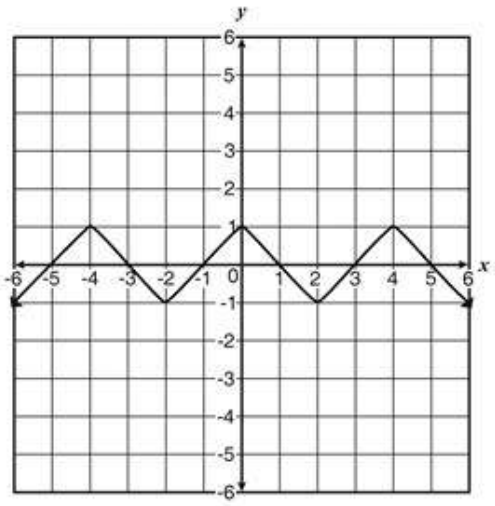
105. **The graph below shows the temperature of water as a function of time as it is heated to its boiling point (212°F).**



What is the range of this function?

A. all real numbers less than or equal to 212
B. all real numbers greater than or equal to 50
C. all real numbers between and including 0 and 8
D. all real numbers between and including 50 and 212

106. **Which option describes the domain of the given function?**



A. The domain is –1, 0 and 1.
B. The domain is all real numbers.
C. The domain is all real numbers less than or equal to 1.
D. The domain is all real numbers between and including –1 and 1.

107. **Terence's spending account balance is represented by the formula $A(t) = 100(0.9)^t$, where *t* is time elapsed in weeks. What will his account balance be after 2 weeks?**

A. 41
B. 45
C. 81
D. 90

108. **The function rule $A = s^2$ is a model for the area, *A*, of a square with side of length *s*. Which of the following represents another way to write this function rule?**

A. $A = 2s$
B. $s = A^2$
C. $A(s) = s^2$
D. $A(x) = s^2$

109. The function $f(x) = 2{,}300(1.07)^x$ models the value of an investment after x years. What is the ***approximate*** value of the investment after 3 years?

A. $2,461
B. $2,633
C. $2,818
D. $3,015

110. **Let $a \lozenge b$ be defined by $a \lozenge b = 3a + 2b$. What is the value of $5 \lozenge 4$?**

A. 14
B. 22
C. 23
D. 45

111. Ricky invested $20,000 at a 6% interest rate, compounded annually. The function $V(t) = 20{,}000(1.06)^t$ models the value of the investment after t years. What will be the ***approximate*** value of the investment after 5 years?

A. $14,700

B. $18,800

C. $21,200

D. $26,800

112. The diameter, in meters, of a tree trunk is modeled by the function $d(h) = 1.3h^{\frac{3}{2}}$, where h is the height of the tree in meters. What is the ***approximate*** diameter of a 50 meter tall tree?

A. 110 cm

B. 230 cm

C. 460 cm

D. 520 cm

113. A man's shoe size is related to his foot length and can be modeled by the equation $s = 1.7f - 7.2$, where s is shoe size and f is foot length, in inches. What is the shoe size of a man whose foot measures 9 inches?

A. 6

B. 8

C. $9\frac{1}{2}$

D. $10\frac{1}{2}$

114. The function $f(x) = 120.882(1.012)^x$ models the population of a country, in millions, x years after 1930. What was the ***approximate*** population of the country in 1991?

A. 121.9 million

B. 122.3 million

C. 250.2 million

D. 253.3 million

115. The function $h(t) = 300 - 16t$ represents the height of a ball (in feet) dropped from 300 feet after t seconds. What will be the height of the ball after 2.4 seconds?

A. 38.4 feet

B. 261.6 feet

C. 338.4 feet

D. 384 feet

116. **The function $h(t) = -16t^2 + 75t + 80$ models the height of a ball as it is thrown into the air, where h is in feet and t is in seconds. What is the height of the ball once 5 seconds have passed?**

A. 55 feet

B. 124 feet

C. 375 feet

D. 535 feet

117. The function $h(f) = 69.1 + 2.2f$ can be used to approximate the height of a male, in cm, based on the length, f, of the femur bone, in cm. ***Approximately*** how tall is a male whose femur bone measures 53 cm?

A. 116.6 cm

B. 122.1 cm

C. 185.7 cm

D. 205.0 cm

118. Which function has the largest value for $f(^{-}3)$?

A. $f(x) = 2x - 5$

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

C. $f(x) = 6 - 3^x$

D. $f(x) = 2^x + 10$

119. What is the value of $f(^{-}5)$ if $f(x) = {}^{-}x - 4$?

A. $^{-}9$

B. $^{-}1$

C. 1

D. 9

120. **The probability that a new machine will not need any repairs within *t* years from now is modeled by an exponential function of *t*. This probability is multiplied by 0.2 whenever the time period *t* is extended by 3 years as shown by the function below.**

$$f(t) = (0.2)^{\frac{t}{3}}$$

If the probability that the machine does not need repairs right now is 1, what is the probability that the machine will not need repairs within 12 years from now, according to the model?

A. 0.8

B. 0.05

C. 0.008

D. 0.0016

121. What is the value of x in $f(x) = \frac{x}{3} - \frac{1}{6}$, when $f(x) = 0.5$?

A. 2

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. 0

122. The formula to convert a temperature from Celsius to Fahrenheit is $F = 1.8C + 32$. If the temperature drops from 86°F to 68°F, how many degrees Celsius did it drop?

A. 10°C

B. 18°C

C. 20°C

D. 38°C

123. What is the value of $f(^{-}6)$ for the function $f(x)=\frac{1}{2}x-7$?

A. $^{-}10$

B. $^{-}4$

C. 4

D. 10

124. **Suppose $f(x) = x^2$ and $g(x) = 2x - 3$. What is the value of $g(4)+f(-3)$?**

A. -4

B. 7

C. 14

D. 25

125. Mark owns a lawn service company. He uses the function $f(t) = 10t + 25$ to determine the cost of his services where t is the time, in hours, he spent mowing. How much will Mark charge for working 2.5 hours?

A. $25.00

B. $50.00

C. $72.50

D. $87.50