TEST NAME: **Math 1 Q4 Review test**
TEST ID: **3104245**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

1. Which function has the greatest value when $x \geq 3$?

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

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

   C. $f(x) = 3^x - 5$

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

2. What are the zeros of the function defined by $2x^2 + 7x + 3$?

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

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

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

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

3. What is the **_approximate_** value of the correlation coefficient when the data set below is modeled by its linear best-fit equation?

x	y
25	49
26	60
24	55
27	61

   A. 0.6711

   B. 0.6716

   C. 0.6807

   D. 0.6845

4. Which point lies on the graph of $y = 7 - 3x$?

    A. $(^-5, 8)$

    B. $(^-4, 19)$

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

    D. $(^-2, ^-13)$

5. The function $f(x) = 800(1.05)^x$ models the weight, in grams, of a bacterial culture after x weeks. What is the **approximate** average rate of change in the weight of the culture between weeks 10 and 15?

    A. 72 grams per week

    B. 111 grams per week

    C. 130 grams per week

    D. 297 grams per week

6. A system of equations is shown below.

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

What is the solution set to the system of equations?

    A. $(0, 1)$

    B. $(0.5, 0)$

    C. no solution

    D. infinite solutions

7. The table below shows the scores of two classes on a science project.

Class A	Class B
78	65
65	78
90	80
77	76
88	70
80	65
94	81
89	78
75	73
80	80

What is the difference between the two classes' mean scores?

A. 3

B. 4

C. 7

D. 13

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

A. $(^-16, 0)$

B. $(^-8, 0)$

C. $(2, 0)$

D. $(4, 0)$

9. The table below shows the total number of tablets, *y*, an electronic store sold on Thursday and Friday, *x* hours after opening on Friday.

Hours Since Opening	Total Tablets Sold
1	31
4	33
7	42
13	50

What is the meaning of the rate of change of the linear best-fit model for the data?

A. The store sold about 5 tablets every 3 hours.

B. The store sold about 3 tablets every 5 hours.

C. The store sold about 3 tablets every hour.

D. The store sold about 5 tablets every hour.

10. Sarah asked her mother to help her save money to buy a bike. Which situation could be represented by a linear function?

A. Sarah's mother will give her $10 each week.

B. Sarah's mother will give her 5% of what she saves each week.

C. Sarah's mother will give her $5 each week, plus 1% of what Sarah has saved.

D. Sarah's mother will give her $2 the first week, $4 the second week, $8 the third week, and so on.

11. Sarah is going to eat raisins and bananas in order to get the amount of potassium recommended each day.

- She wants to eat at least 1 box of raisins and at least 2 bananas each day.
- Each box of raisins has 322 mg of potassium and 129 calories.
- Each banana has 361 mg of potassium and 90 calories.
- She needs between 2,000 and 2,500 mg of potassium each day.

Which system below could be used to find the number of boxes of raisins, x, and bananas, y, that Sarah needs to minimize her weekly calorie intake?

A. $x \geq 1$
$y \geq 2$
$14{,}000 \leq 322x + 361y \leq 17{,}500$
Calories $= 129x + 90y$

B. $x \geq 1$
$y \geq 2$
$2{,}000 \leq 322x + 361y \leq 2{,}500$
Calories $= 129x + 90y$

C. $x \geq 7$
$y \geq 14$
$14{,}000 \leq 322x + 361y \leq 17{,}500$
Calories $= 129x + 90y$

D. $x \geq 7$
$y \geq 14$
$2{,}000 \leq 322x + 361y \leq 2{,}500$
Calories $= 129x + 90y$

12. Which point is an **approximate** solution to the equation $y = 2(1.03)^x$?

A. $(2, 2)$

B. $(2, 2.06)$

C. $(2, 2.12)$

D. $(2, 4.12)$

13. Two functions are shown below.

$$y = {}^-2x + 3$$
$$y = 4x - 9$$

What is the value of $x + y$ when the two functions are equal?

A. $^-3$

B. $^-1$

C. 1

D. 3

14. Jorge plans to save $25 a week to purchase a new bike. The function $f(x)$ = 250 − 25x models the amount of money that Jorge will need to purchase the bike x weeks after he starts saving. Which is the **most appropriate** domain for the function?

A. all integers ≥ 10

B. all integers ≤ 10

C. all non-negative integers ≥ 10

D. all non-negative integers ≤ 10

15. The table below shows the height of a plant at different amounts of time since it was planted.

Time (weeks)	Height (cm)
1	1
2	4
3	6
4	9
5	11

Which *best* describes the correlation between plant height and time?

A. weak negative correlation

B. weak positive correlation

C. strong negative correlation

D. strong positive correlation

16. The scatterplot below shows the number of customers and the amount of money earned over four days at the cafeteria.
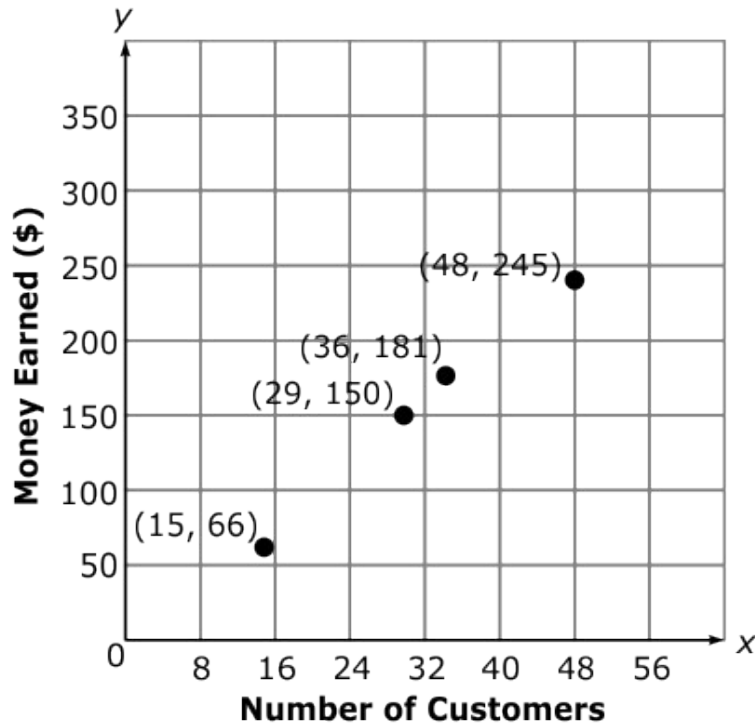
What is the **approximate** correlation coefficient when the data is modeled by its linear best-fit equation?

A. 0.120

B. 0.538

C. 0.997

D. 0.999

17. The table below shows the price of pizza based on the number of toppings on the pizza at 5 different pizza places.

Number of Toppings (x)	Price (y)
1	$9.00
4	$16.75
2	$12.00
1	$10.50
3	$13.25

Which **best** describes the slope of the linear best-fit equation for the data?

A. The average increase in price for each additional topping is $2.20.

B. The average increase in price for each additional topping is $1.50.

C. The average price of a pizza with no toppings is $9.66.

D. The average price of a pizza with no toppings is $7.46.

18. Suppose the total cost of a ride in a taxi can be modeled by the function $T = 5 + 0.85x$, where T is the total cost and x is the total number of miles. What does the slope of the equation represent?

A. the initial cost of the taxi

B. the total cost of the trip

C. the charge for each mile of the trip

D. the total number of miles for the trip

19. A rectangle has a perimeter of 52 inches. The length of the rectangle is 4 inches more than its width. What is the length of the rectangle?

A. 11 inches

B. 13 inches

C. 15 inches

D. 19 inches

20. The table below shows the relationship between *x* and *y*.

x	y
2	12
4	56
5	108
7	428
8	860

Which function **best** models the data?

A. $y = 3.09(2.03)^x$

B. $y = 2.03(3.09)^x$

C. $y = 2(6)^x$

D. $y = 6(2)^x$

21. Leon bought some trees and shrubs for $169.50. Each tree cost $22.50 and each shrub cost $17.00. He bought twice as many shrubs as trees. How many shrubs did Leon buy?

A. 3

B. 6

C. 12

D. 24

22. A system of equations is shown below.

$$y = {}^-x + 3$$
$${}^-3x + y = 5$$

What is the *x*-value of the solution to the system?

A. $^-1$

B. $^-0.5$

C. 0.5

D. 1

23. The table below shows the height of a plant, in inches, over 5 weeks.

Week (x)	Height (y)
0	0
1	1
2	3
3	6
4	8
5	11

Which is an **approximate** equation of the line of best fit for the data?

A. $y = 2x - 0.5$

B. $y = 2.2x$

C. $y = 2.25x - 0.8$

D. $y = 2.5x - 0.4$

24. The perimeter of a rectangle is represented by the expression $12x - 28$. The length of the rectangle is represented by the expression $2x + 10$. Which expression represents the width of the rectangle?

A. $4x - 24$

B. $5x - 9$

C. $8x - 48$

D. $10x - 18$

25. Two functions are shown below.

$$f(x) = 350x + 400$$
$$g(x) = 200(1.35)^x$$

Which statement **best** describes the two functions?

A. $f(x)$ always exceeds $g(x)$

B. $f(x)$ is always less than $g(x)$

C. $f(x) > g(x)$ for whole numbers less than 10

D. $f(x) < g(x)$ for whole numbers less than 10

26. Which function passes through the points shown in the table below?

x	0	1	2	3
y	1,000	500	250	125

A. $y = 1,000 - 500x$

B. $y = 1,000 - 250x$

C. $y = 1,000(0.5)^x$

D. $y = 1,000(0.25)^x$

27. Which graph shows the solution set of the system of inequalities shown below?
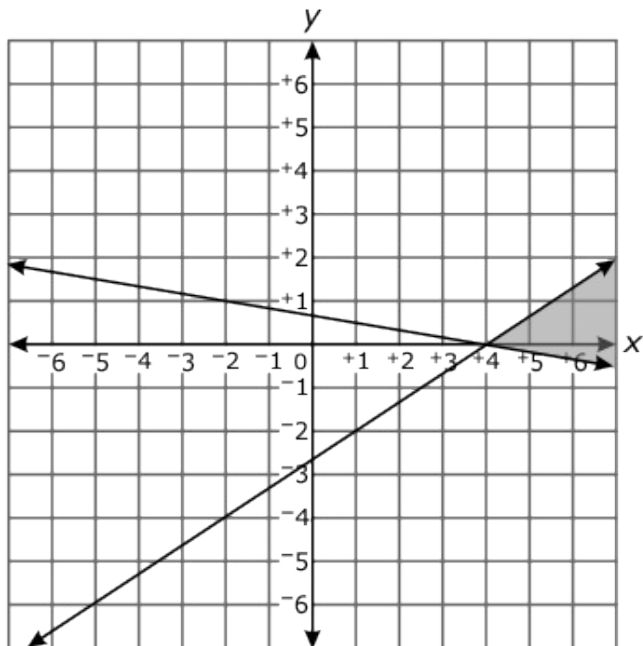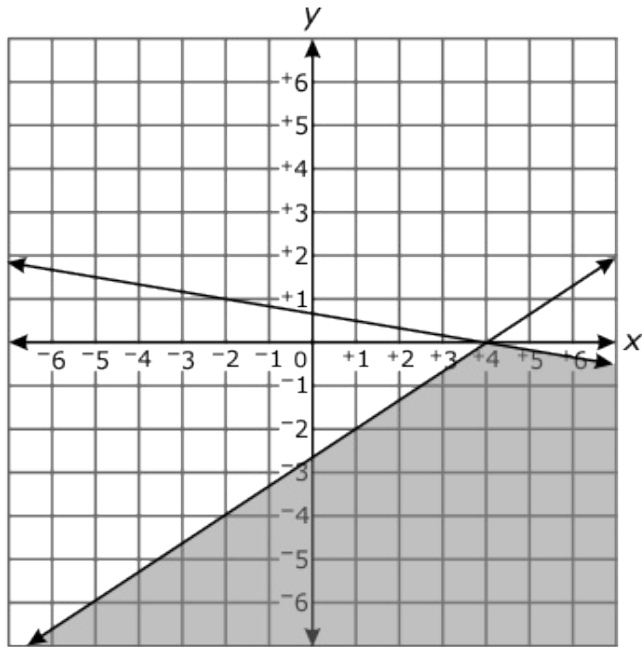
$$2x - 3y \geq 8$$
$$x + 5y \leq 3$$

A.

B.

C.

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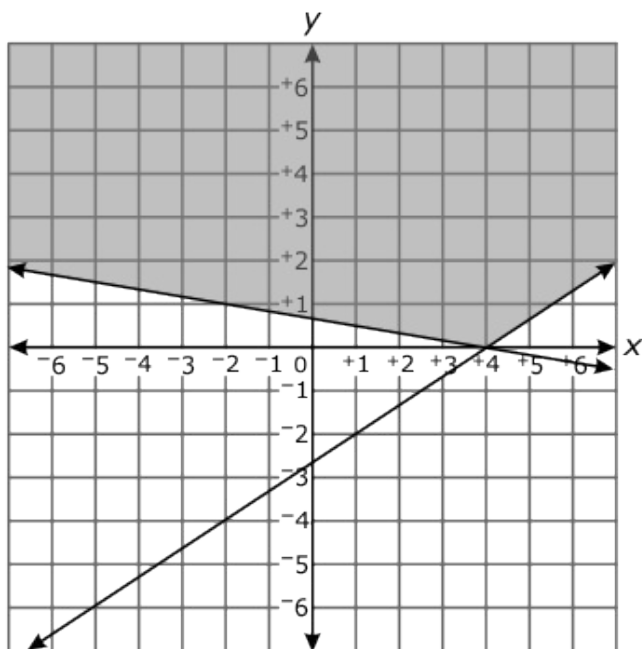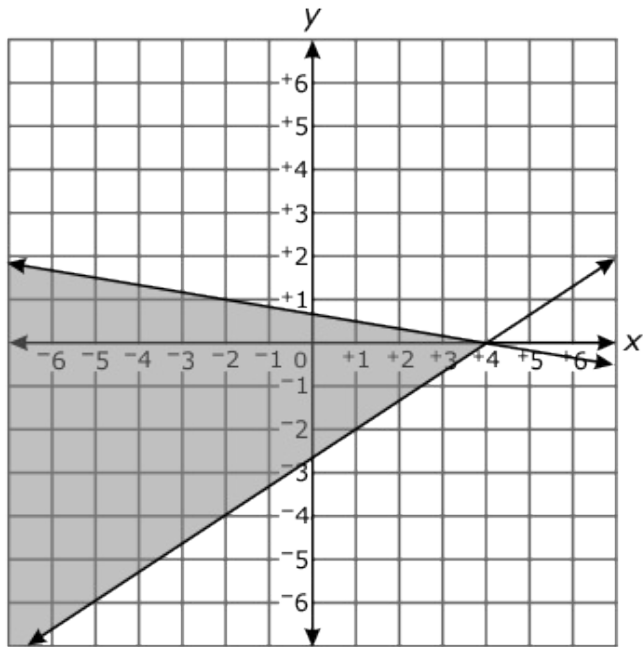
D.

28. A phone company charges a $45 monthly fee for 500 minutes of phone use. For each minute over 500, the phone company charges an additional $0.08. Which equation can be used to determine the total amount the company charges, t, for a phone call that is m minutes long, where m is greater than 500?

A. $t = 0.08m + 45$

B. $t = 45 - 0.08(m - 500)$

C. $t = 0.08(m - 500) + 45$

D. $t = 0.08(m + 500) + 45$

29. A taxi company uses the function $f(x) = 0.45x + 3.50$ to determine the cost to take a taxi x miles. What is the meaning of the coefficient of x?

A. the cost per mile

B. the number of miles

C. the total cost to ride a taxi

D. the fixed fee the company charges

30. The table below shows some values of a quadratic function.

x	f(x)
⁻1	⁻8
0	⁻2
1	6
2	16
3	28

Which statement is true?

A. An x-intercept of the function is ⁻2.

B. The y-intercept of the function is (0, 6).

C. The minimum value of the function is ⁻14.

D. The axis of symmetry of the function is $x = ⁻3.5$.

31. A square has a side length of $3x + 4$ units. A second square has a side length that is 2 times the side length of the first square. What is the area of the second square?

A. $9x^2 + 24x + 16$

B. $18x^2 + 48x + 32$

C. $27x^2 + 72x + 54$

D. $36x^2 + 96x + 64$

32. The length of a vine is predicted to increase by 3 feet each week. The vine is currently 12 feet. In how many weeks will the vine reach a predicted length of 33 feet?

A. 3

B. 4

C. 7

D. 11

33. Monty graphed an exponential function that has a *y*-intercept of 0 and increases as *x* moves from negative infinity to positive infinity. Which could be the function that Monty graphed?

A. $y = 2^x$

B. $y = 2^x - 1$

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

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

34. What is the sum of the zeros of the function defined by $2x^2 - 8x - 24$?

A. $^-8$

B. $^-4$

C. 4

D. 8

35. Marcus measured the height, in inches, *y*, of plants over the course of 3 weeks. The correlation coefficient between the number of days, *x*, and the height of the plants is 0.85. Which could be concluded based on the correlation coefficient of the data?

A. There is a strong relationship showing that as the number of days increases, the height of the plants increases.

B. There is a strong relationship showing that as the number of days increases, the height of the plants decreases.

C. There is a weak relationship showing that as the number of days increases, the height of the plants increases.

D. There is a weak relationship showing that as the number of days increases, the height of the plants decreases.

36. Two unique sets of data are represented by either circles or squares on the graph below.
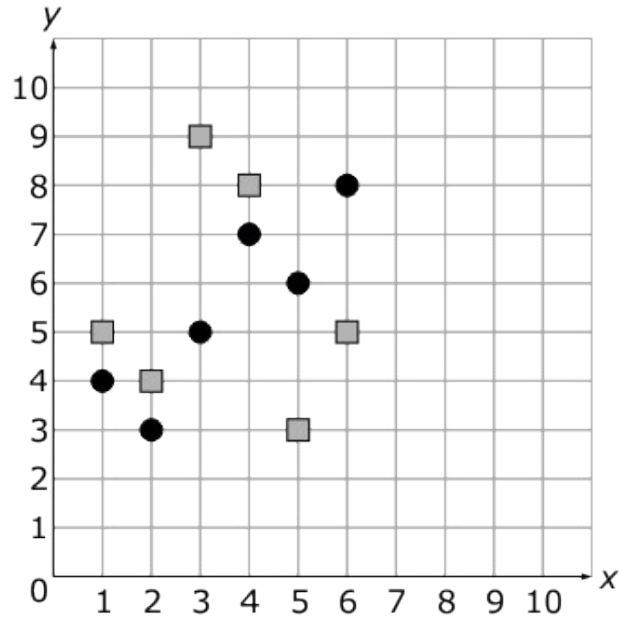
Which statement is true about the best-fit linear model for each set of data?

A. The circle data set has a strong, negative correlation.

B. The square data set has a strong, positive correlation.

C. The circle data set has a strong, positive correlation.

D. The square data set has a strong, negative correlation.

37. In which function is the population, y, increasing by 50 each month, x?

A. $y = 50x + 100$

B. $y = 100(50)^x$

C. $y = 100x + 50$

D. $y = 50(100)^x$

38. Jim compared the number of songs on six of his CDs to the length of the CDs in minutes. The table below shows the results.

Number of Songs (x)	Length of CD (y)
5	14.2 minutes
15	42.6 minutes
12	34.5 minutes
13	39.5 minutes
12	34.2 minutes
14	42.4 minutes

Which conclusion can be made based on the correlation coefficient of the line of best fit for the data?

A. There is a strong positive correlation between the number of songs and the length of the CD.

B. There is a strong negative correlation between the number of songs and the length of the CD.

C. There is a weak positive correlation between the number of songs and the length of the CD.

D. There is a weak negative correlation between the number of songs and the length of the CD.

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

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

B. $6x^2 - 5x - 4$

C. $6x^2 - x - 4$

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

40. The function $f(x) = 1{,}575 - 225x$ models the value of a computer x years after it was purchased. What is an appropriate domain for this function?

A. $x \geq 0$

B. $x \leq 7$

C. $0 \leq x \geq 7$

D. $0 \leq x \leq 7$

41. What is the solution to the inequality $3x + 24 > 15x$?

A. $x < 2$

B. $x > 2$

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

D. $x > \frac{4}{3}$

42. Two functions are shown below.

$$f(x) = 20 + 2x$$
$$g(x) = 0.25(2)^x$$

For which positive integer value of x will the value of $g(x)$ first exceed the value of $f(x)$?
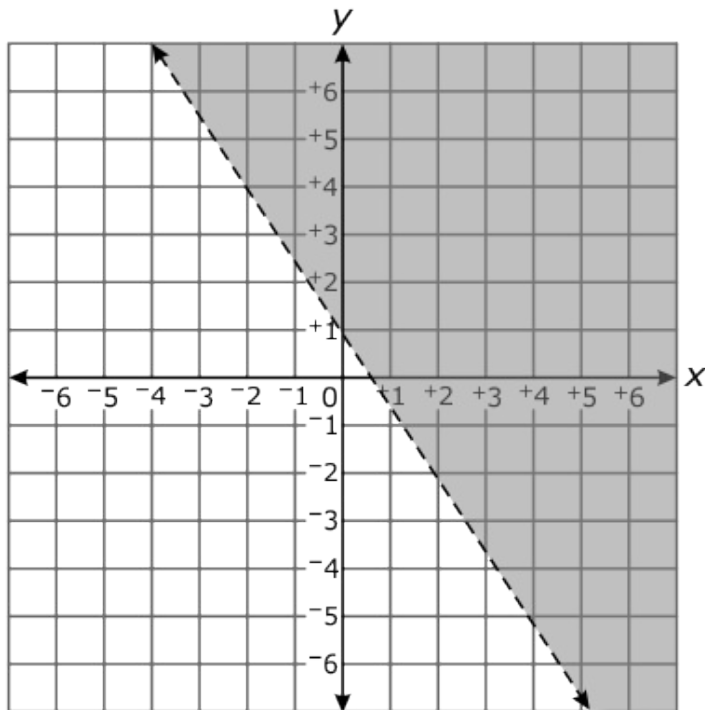
A. 8

B. 7

C. 6

D. 5

43. Which inequality is graphed below?

A. $2x + 3y < 3$

B. $2x + 3y > 3$

C. $2x - 3y < 3$

D. $2x - 3y > 3$

44. The combined age of April and Laura is 23 years. Laura's age is two years more than half of April's age. What is Laura's age?

A. 6

B. 8

C. 9

D. 14

45. Maria began the school year with $200 in her school lunch account.

- The amount of money in the account has decreased linearly.
- After 3 months, she had $155 in her account.
- After 5 months, she had $125 in her account.

Which function models the amount of money that Maria has in her account at the end of *n* months?

A. $f(n) = 200 - 30n$

B. $f(n) = 200 - 15n$

C. $f(n) = 30n - 200$

D. $f(n) = 15n - 200$

46. The table below shows the height of a tree after different amounts of time since it was planted.

Time (months)	Height (inches)
0	24
1	27
2	31
3	35
4	40

What is the meaning of the slope of the line of best fit for the data?

A. The tree grew about 4 inches every month.

B. The tree grew about 1 inch every 4 months.

C. The tree grew about 3 inches every month.

D. The tree grew about 1 inch every 3 months.

47. Which inequality is graphed below?
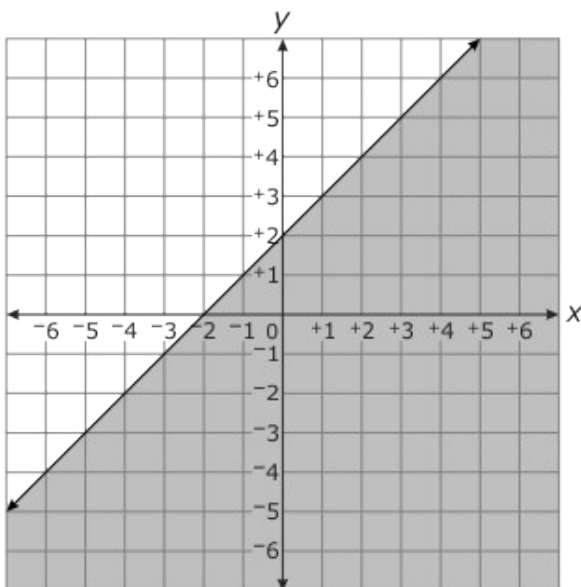
A. $x \geq y - 2$

B. $x \leq y - 2$

C. $x - 2 \geq y$

D. $x - 2 \leq y$

48. Two functions are shown in the table below.

x	f(x)	g(x)
5	14	0
10	19	⁻5
15	24	⁻10
20	29	⁻15

For what value of x does $f(x) = g(x)$?

A. ⁻19

B. ⁻2

C. 7

D. 28

49. Which function represents the graph below?
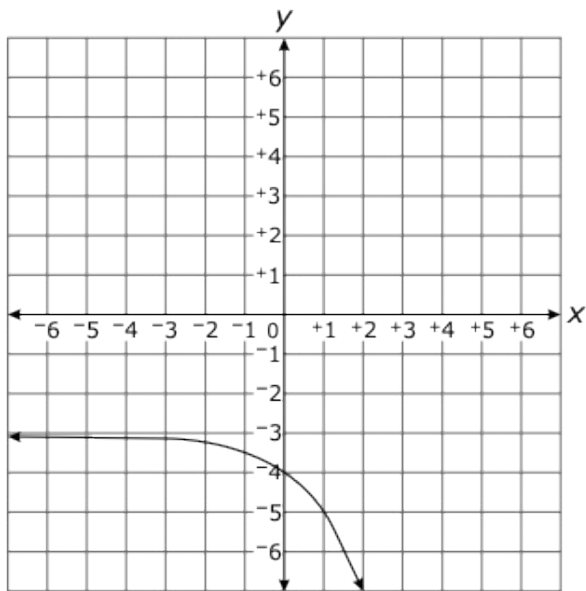
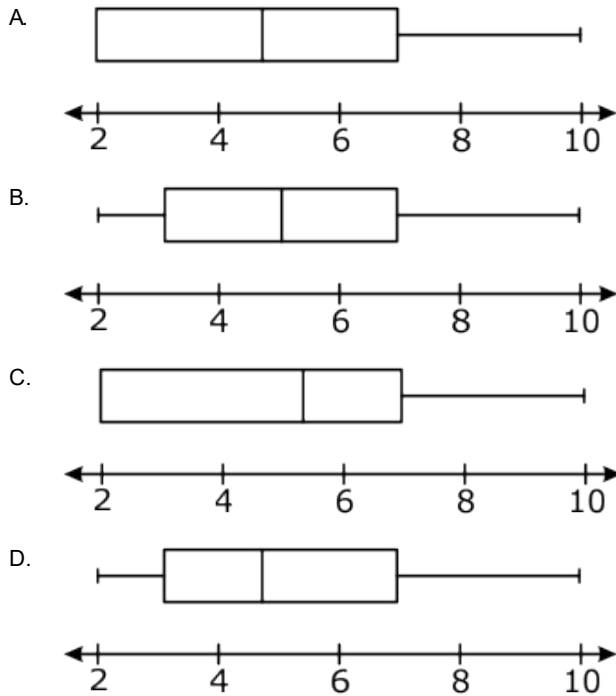A. $y = {}^-2^x - 3$

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

C. $y = 2^x - 3$

D. $y = 2^x + 3$

50. A charity tracked the number of donations given each day at one of its drop-off points. The data is given below.

5, 10, 2, 5, 10, 7, 7, 5, 2, 3, 4, 2, 2, 3

Which box plot displays the donations?

A.

B.

C.

D.

51. What is the value of the smaller zero of the function defined by $2x^2 + 9x + 7$?

A. -7

B. $-\dfrac{7}{2}$

C. -1

D. $-\dfrac{2}{7}$

52. Which choice is the graph of $y = (4 - x)(x + 2)$?

A.
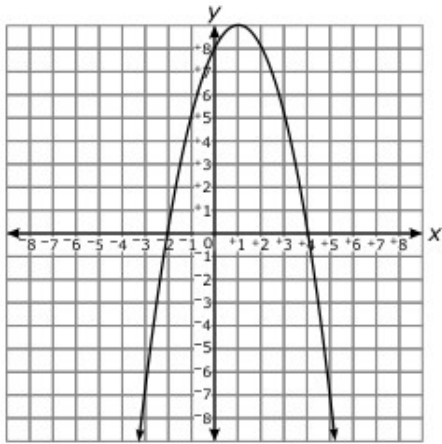
B.
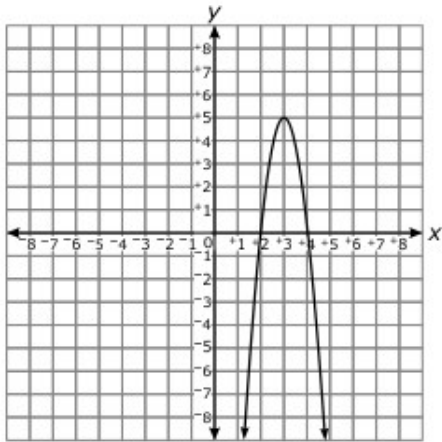
C.
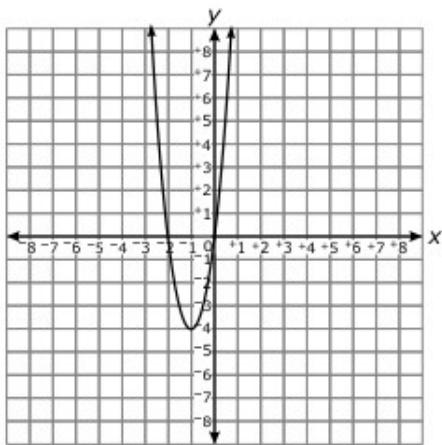
D.
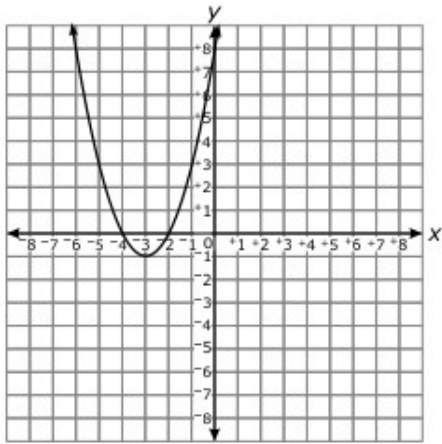
53. The function $f(x) = 2,500(0.97)^x$ models the value of an investment after x months. Which statement is true about the value of the investment?

A. The value of the investment increases by 3% each month.

B. The value of the investment decreases by 3% each month.

C. The value of the investment increases by 97% each month.

D. The value of the investment decreases by 97% each month.

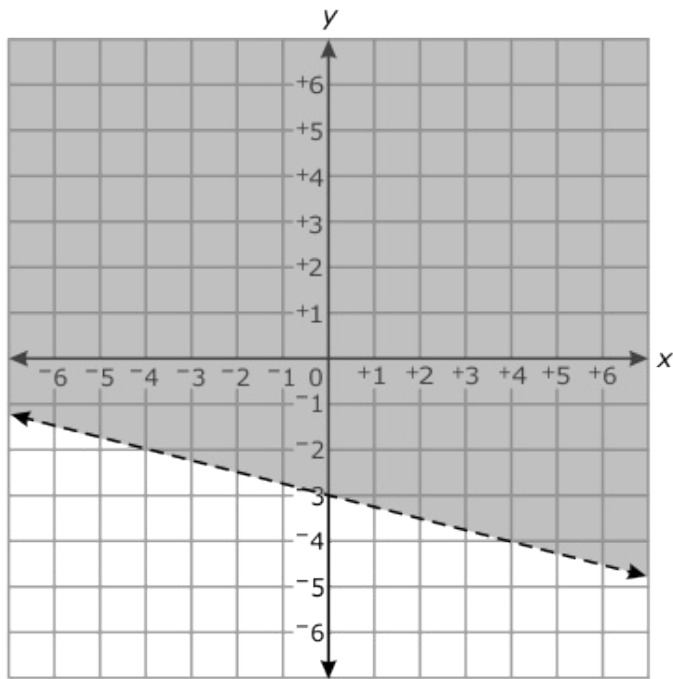54. Which system of inequalities is represented by the graph below?
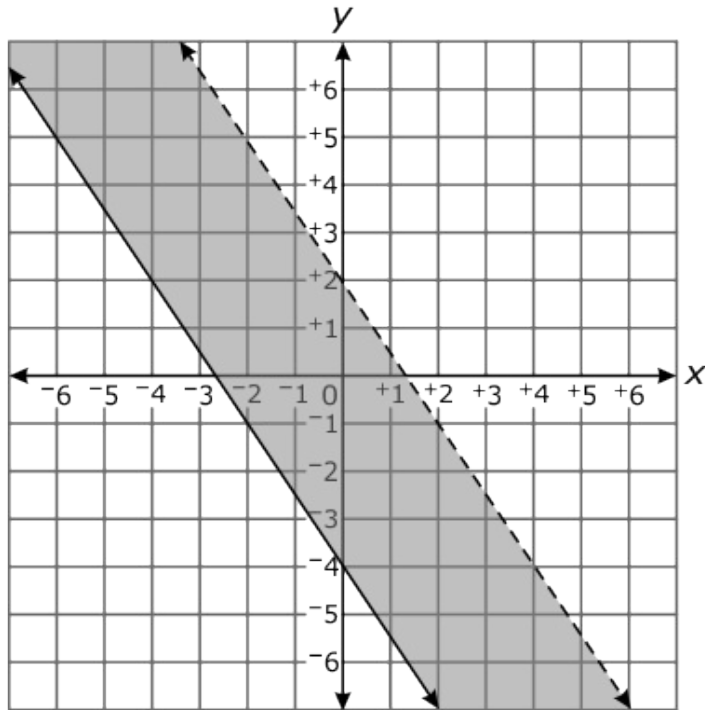
A. $3x + 2y > 4$
$3x + 2y \geq {}^-8$

B. $3x + 2y < 4$
$3x + 2y \geq {}^-8$

C. $3x + 2y \geq 4$
$3x + 2y > {}^-8$

D. $3x + 2y \leq 4$
$3x + 2y > {}^-8$

55. The side length of a square is represented by the expression $2x + 5$. Which expression represents the difference between the area of the square and the perimeter of the square?
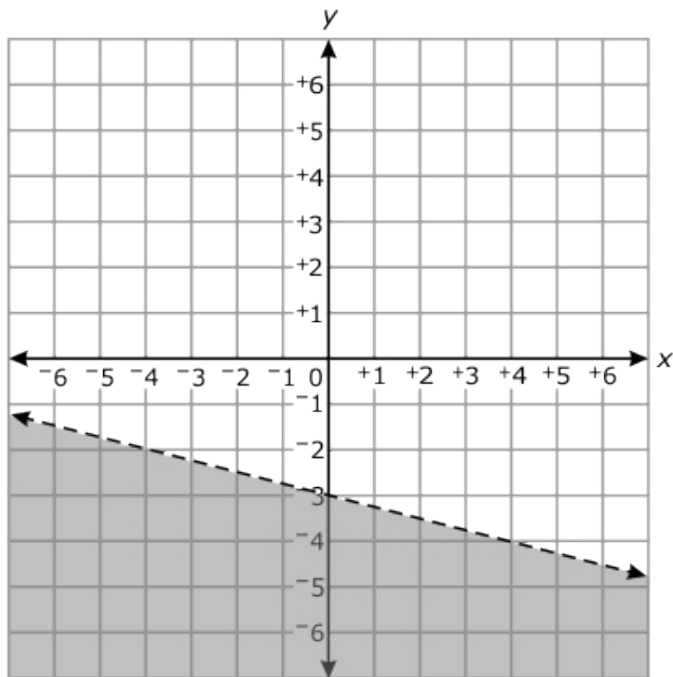
A. $4x^2 + 12x + 5$

B. $4x^2 + 12x + 30$

C. $4x^2 + 18x + 20$

D. $4x^2 + 18x + 30$

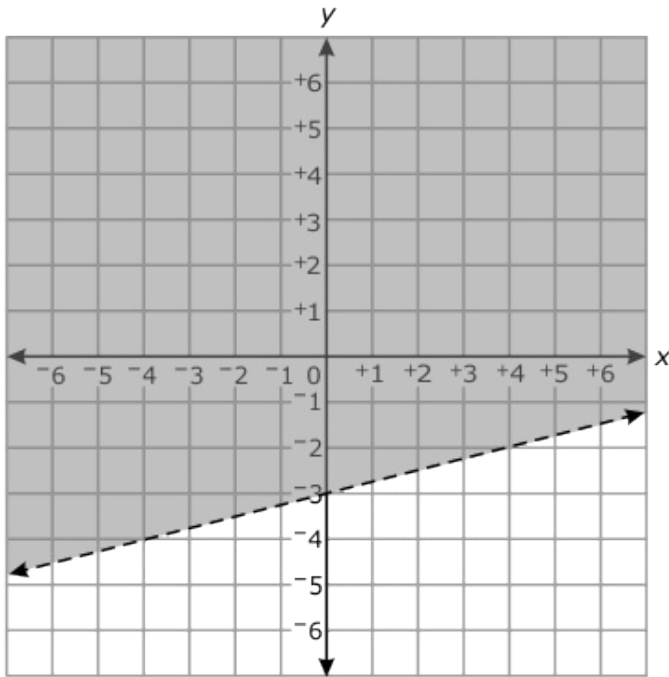56. Which is the graph of the inequality $2x - 4y > 3x + 12$?

A.
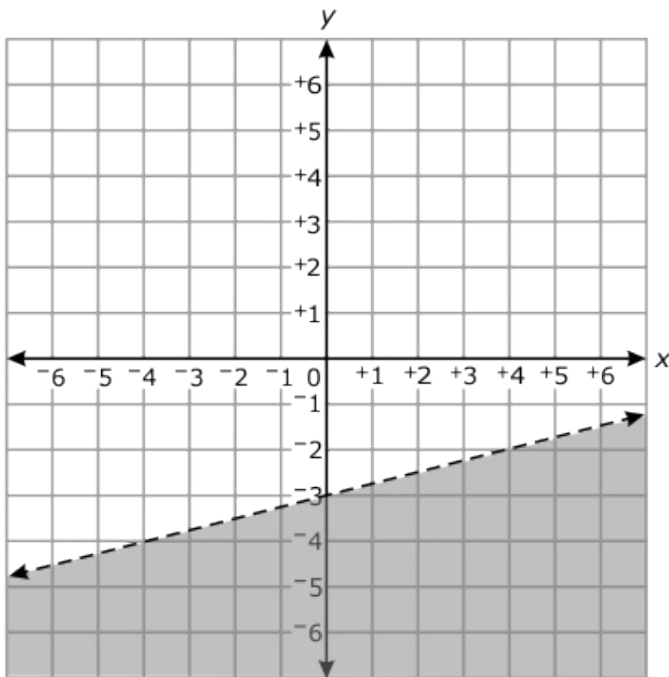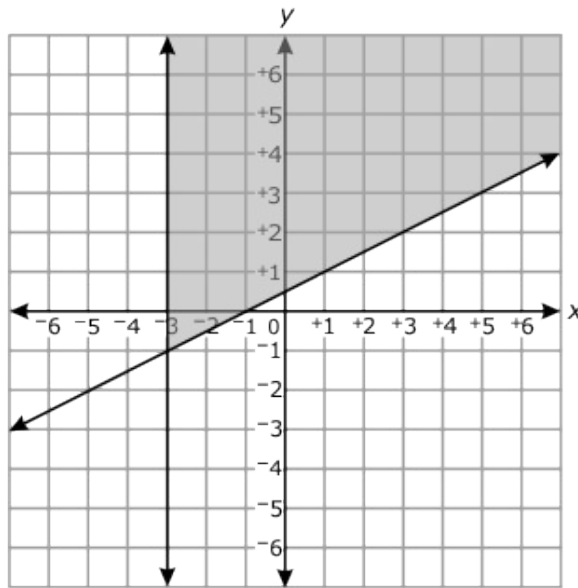

B.

C.

D.

57. For what values of x is the function $g(x) = {}^-x^2 + 7x - 10$ negative?

A. $2 \le x \le 5$

B. $2 < x < 5$

C. $x < 2$ or $x > 5$

D. $x \le 2$ or $x \ge 5$

58. Which system of inequalities is represented on the graph below?

A. $x + 2y \leq {}^{-}1$
    $x \geq {}^{-}3$

B. $x + 2y \geq {}^{-}1$
    $x \leq {}^{-}3$

C. $x - 2y \leq {}^{-}1$
    $x \geq {}^{-}3$

D. $x - 2y \geq {}^{-}1$
    $x \leq {}^{-}3$

59. The table below shows the number of hours per week six students spend online and their current grades in math.

Hours Online (per week)	12	8	15	25	4	1	9
Current Math Grade	78	82	73	68	90	93	85

Using a line of best fit, which statement **best** describes the *y*-intercept of the equation?

A. the number of hours spent online if a student's grade were zero

B. the average change in the grade of a student per hour spent online

C. the grade a student should expect when no time is spent online

D. the point at which a student's grade is the lowest

60. Which expression is equivalent to $6x^2 + 38x + 56 - (2x^2 + 13x - 45) - 6x^2 - 14x - 12$?

A. $^-2x^2 + 65x + 23$

B. $^-2x^2 + 39x + 113$

C. $^-2x^2 + 37x - 1$

D. $^-2x^2 + 11x + 89$

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