TEST NAME: **CCS Math I Cumulative Review 15-16**
TEST ID: **927728**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **Shared Classroom Assessments**

03/03/16, CCS Math I Cumulative Review 15-16

Student: _____

Class: _____

Date: _____

Instructions

Questions 1 - 18 are Calculator INACTIVE. Open Response (7 - 18).

Questions 19 - 60 are Calculator ACTIVE.

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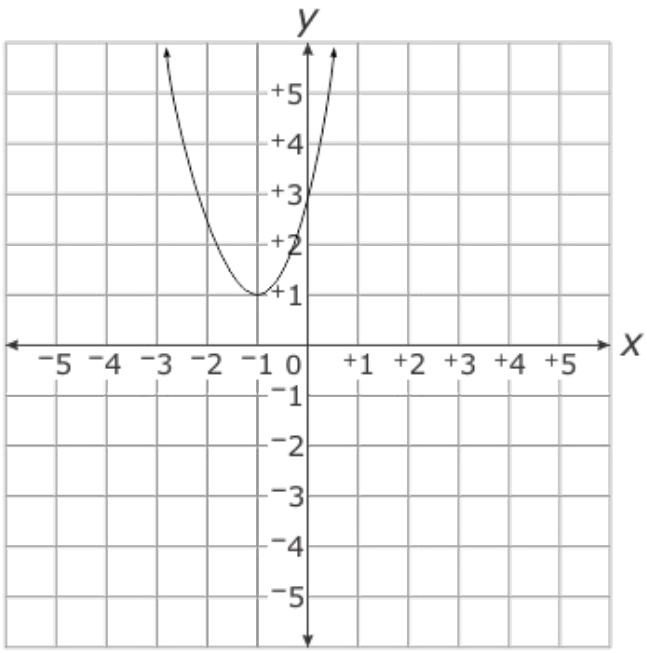
1. Which graphs shows a quadratic function with a *y*-intercept of 3 and an axis of symmetry at $x = -1$?

A.



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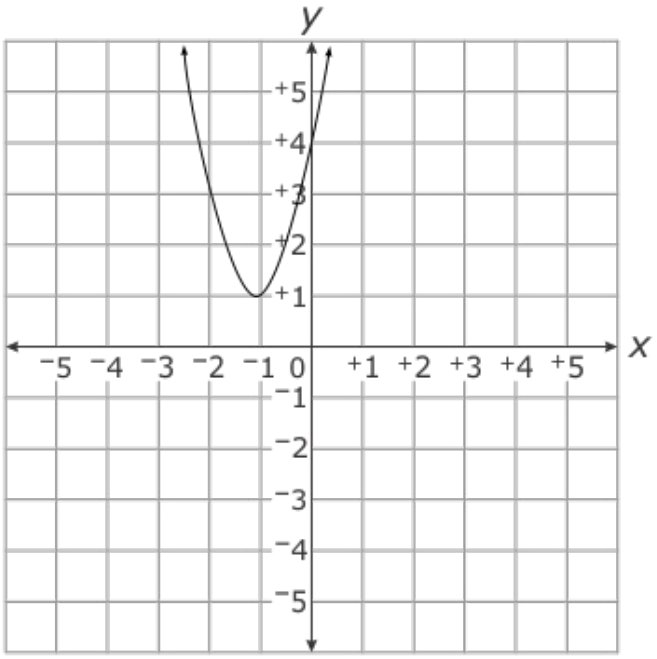

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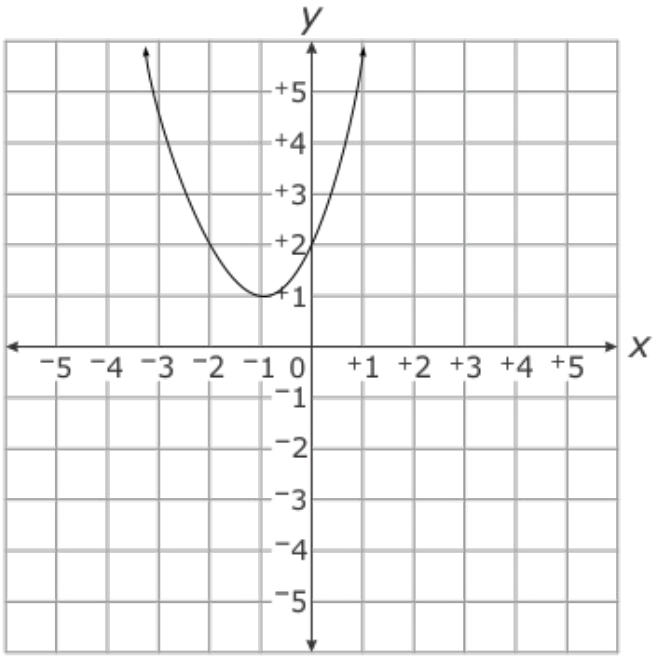

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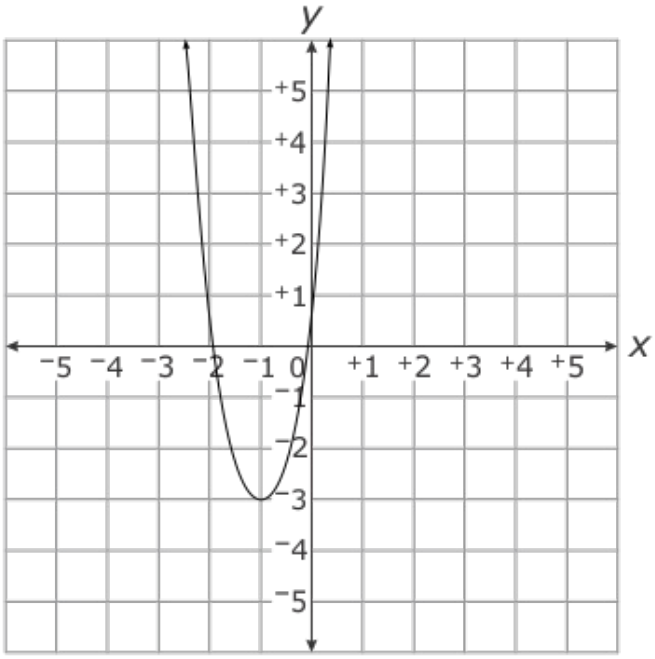
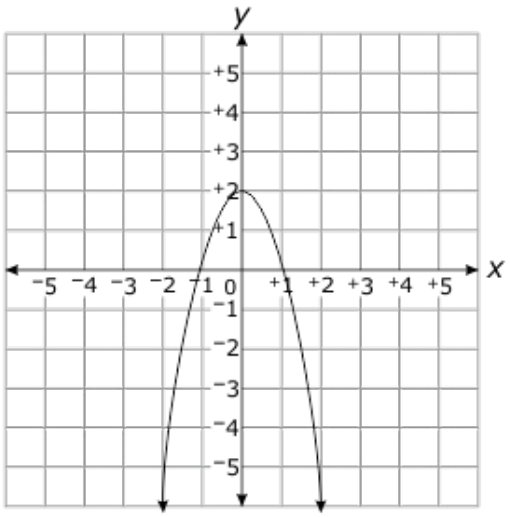


2. Which choice is the graph of $f(x) = {}^{-}x^{2} + 2x + 4$?

A.



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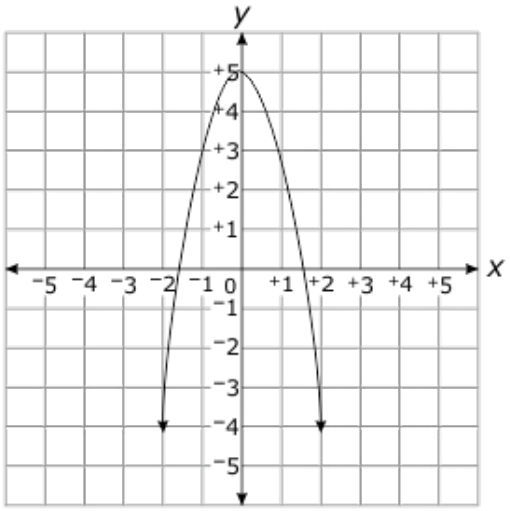
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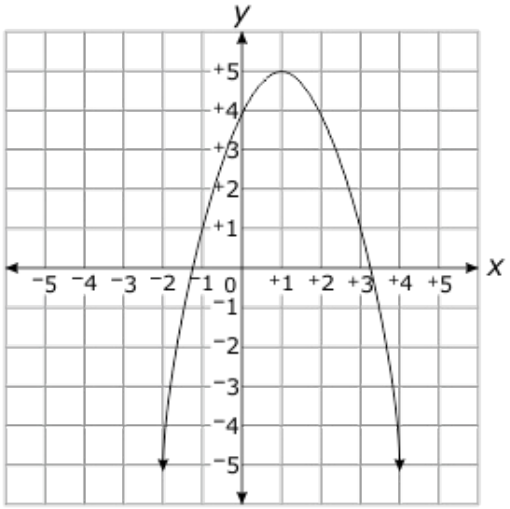
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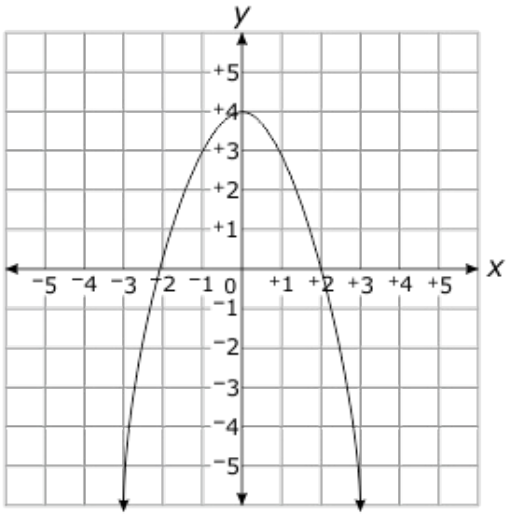
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−5

3. Which statement is true about the function $f(x) = 6x + 2$ and the linear function that fits the values in the table below?

x	$g(x)$
-1	8
1	-4
3	-16
5	-28
7	-40

A. $f(x)$ has the same slope as $g(x)$.

B. $f(x)$ has the same y-intercept as $g(x)$.

C. $f(x)$ has the same x-intercept as $g(x)$.

D. $f(x)$ and $g(x)$ are the same function.

4. A sequence is shown below.

12, 15, 18, 21, . . .

Which recursive formula models the sequence?

A. NEXT = NOW + 3, starting at 12

B. NEXT = 3 • NOW + 3, starting at 12

C. NEXT = 3 • NOW + 9, starting at 12

D. NEXT = 3 • NOW + 12, starting at 12

5. The function $f(x)$ will be translated 4 units down and 3 units to the right. Which function represents $f(x)$ after the translation?

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

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

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

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

6. Which is an equation of the linear function that passes through the points (3, 7) and (8, ¯13)?

A. $y = 4x - 5$

B. $y = \frac{1}{4}x + \frac{25}{4}$

C. $y = \frac{-1}{4}x + \frac{19}{4}$

D. $y = -4x + 19$

7. Robert takes medicine for an ear infection. There are 250,000 bacteria present when he begins taking the medicine, and 35% of the bacteria are destroyed every hour. How many hours will it take for 70% of the original bacteria to be destroyed?

A. 4 hours

B. 3 hours

C. 2 hours

D. 1 hour

8. The lengths of the sides of triangle *PQR* are consecutive even integers. The perimeter of triangle *PQR* is 42 cm. What is the length of the longest side?

A. 14 cm

B. 16 cm

C. 18 cm

D. 20 cm

9. Angle *EFH* and angle *GFH* are congruent. The measure of $\angle EFH = 3x + 14$ and the measure of $\angle GFH = 9x - 10$. What is the measure of $\angle EFH$?

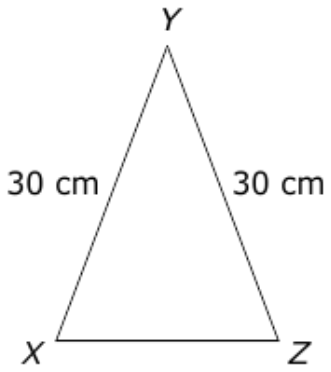
A. 20°

B. 26°

C. 36°

D. 52°

10. In the triangle below, $m\angle X = 4x - 10$ and $m\angle Y = 2x$.



What is the measure of $\angle Z$?

A. 20°

B. 30°

C. 40°

D. 70°

11. A pottery shop sells plates and bowls.

- The shop expects to sell, at least, 10 plates and 15 bowls each day.
- The shop expects to sell, at most, 50 total pieces each day.
- Each plate sells for $14 and each bowl sells for $8.

How many bowls does the shop sell if they made the maximum daily income?

A. 10

B. 15

C. 35

D. 40

12. Two cars leave Charlotte at the same time.

- One car is moving east and the other west.
- After 4 hours, the cars are 456 miles apart.
- One car is traveling 10 miles per hour faster than the other.

What is the speed of the slower-moving car?

A. 47 miles per hour

B. 52 miles per hour

C. 62 miles per hour

D. 67 miles per hour

13. The function $f(x) = 0.85x + 3.99$ models the total cost of purchasing x key chains from an Internet company that charges shipping. The function $g(x) = 1.10x$ models the total cost of purchasing x number of the same key chains from an Internet company that does not charge shipping. Rounding to the nearest whole number, what is the ***best approximation*** of the number of key chains for which the two companies charge the same amount?

A. 14

B. 15

C. 16

D. 17

14. Two functions are shown below.

$$f(x) = 2x - 6$$
$$g(x) = -x + 9$$

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

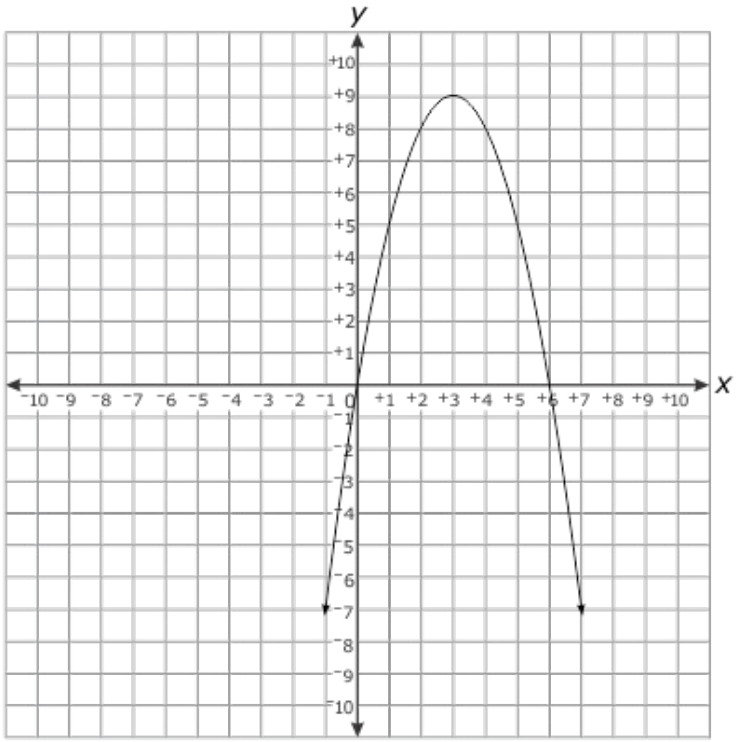
A. 3

B. 4

C. 5

D. 9

15. Shelly compared the maximum value of the function $f(x) = -2x^2 + 8x + 2$ to the maximum value of $g(x)$ graphed below.



What is the value of the larger maximum?

A. 2

B. 3

C. 9

D. 10

16. A 20-gram sample of uranium is decaying at a constant rate. After 5 days there are 19.6 grams of the uranium remaining. After 10 days there are 19.2 grams remaining. Rounding to the nearest tenth, ***about*** how much of the sample remains after 30 days?

A. 2.4 grams

B. 5.9 grams

C. 16.8 grams

D. 17.7 grams

17. What is the area of the triangle whose vertices are located at ($^{-}3$, 3), (5, 1), and ($^{-}3$, $^{-}4$)?

A. 14 square units

B. 25 square units

C. 28 square units

D. 56 square units

18. Karen runs at a rate of 6 miles per hour. David runs at a rate of 900 feet per minute. ***Approximately*** how many yards faster, per second, does David run than Karen? Round to the nearest yard. (Note: 1 mile = 1,760 yards)

A. 1 yard

B. 2 yards

C. 3 yards

D. 4 yards

19. Which expression is equivalent to $(9x^5y^6)^{\frac{1}{2}}$?

A. $3xy^3$

B. $9xy^3$

C. $3x^2y^3\sqrt{x}$

D. $9x^2y^3\sqrt{x}$

20. Which expression is equivalent to $4x \bullet \sqrt[3]{3x^2}$?

A. $(12x^3)^{\frac{1}{3}}$

B. $(19x^6)^{\frac{1}{3}}$

C. $(48x^4)^{\frac{1}{3}}$

D. $(192x^5)^{\frac{1}{3}}$

21. Which expression is equivalent to $y^3 + 4y^2 - 21y$?

A. $(y^2 - 3)(y + 7)$

B. $(y^2 + 3)(y - 7)$

C. $y(y - 3)(y + 7)$

D. $y(y + 3)(y - 7)$

22. Which expression is equivalent to $4x^2 - 121$?

A. $(2x - 11)(2x - 11)$

B. $(2x - 11)(2x + 11)$

C. $(4x - 11)(x - 11)$

D. $(4x - 11)(x + 11)$

23. 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. $2, \frac{1}{3}$

24. Which expression is equivalent to $(2x - 5)^2$?

A. $4x^2 + 25$

B. $4x^2 - 25$

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

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

25. Mr. Frank bought a car that cost $33,000 dollars. The car depreciates approximately 12% of its value each year. Which equation represents the value, v, of the car after t years?

A. $t = 33{,}000(0.12)^v$

B. $v = 33{,}000(0.12)^t$

C. $t = 33{,}000(0.88)^v$

D. $v = 33{,}000(0.88)^t$

26. Adam purchased a baseball card for $0.75.

- The value of the card at the time he purchased it was 5% less than the price he paid for the card.
- The value of the card has increased by $0.83 every year since he purchased the card.

Which equation models the value, v, of the card $t$years after Adam purchased the card?

A. $v = 0.83t + 0.71$

B. $v = 0.83t + 0.75$

C. $v = 0.75t + 0.83$

D. $v = 0.71t + 0.83$

27. Susan wants to make cupcakes and cookies to sell at the school bake sale.

- It takes her 30 minutes to make a dozen cookies and 1 hour to make a dozen cupcakes.
- It costs her $3 to buy supplies for each dozen cookies and $4 to buy supplies for each dozen cupcakes.
- She has 14 hours available to cook and has $50 to spend on supplies.
- She will make at least 1 dozen cookies and 1 dozen cupcakes.

Which system of inequalities models these constraints?

A. $0.5x + y \leq 50$
$3x + 4y \leq 14$
$x \geq 1$
$y \geq 1$

B. $0.5x + y \leq 50$
$4x + 3y \leq 14$
$x \geq 1$
$y \geq 1$

C. $0.5x + y \leq 14$
$3x + 4y \leq 50$
$x \geq 1$
$y \geq 1$

D. $0.5x + y \leq 14$
$4x + 3y \leq 50$
$x \geq 1$
$y \geq 1$

28. The perimeter of a rectangle can be found using the formula $P = 2L + 2W$, where L is the length and W is the width. Which formula represents the length of a rectangle in the terms of the perimeter and width?

A. $L = P - \frac{2W}{2}$

B. $L = \frac{P - 2W}{2}$

C. $L = \frac{1}{2}P - 2W$

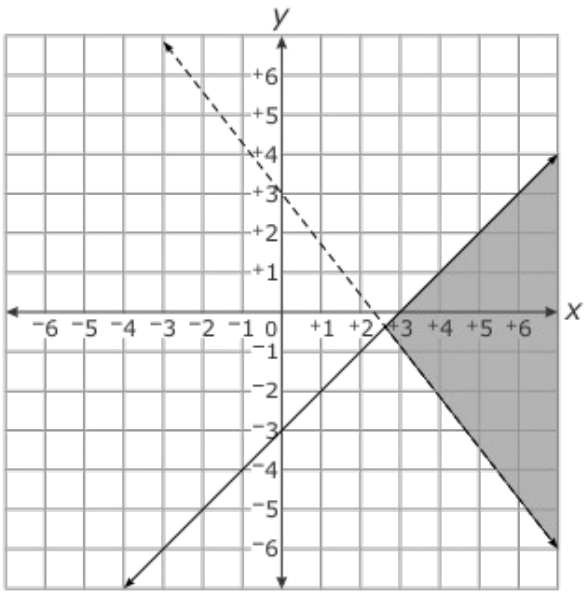
D. $L = \frac{1}{2}P - \frac{1}{2}W$

29. A system of inequalities is shown below.

$$2x - 2y \leq 6$$
$$4x + 3y > 9$$

Which graph shows the solution set to the system?

A.



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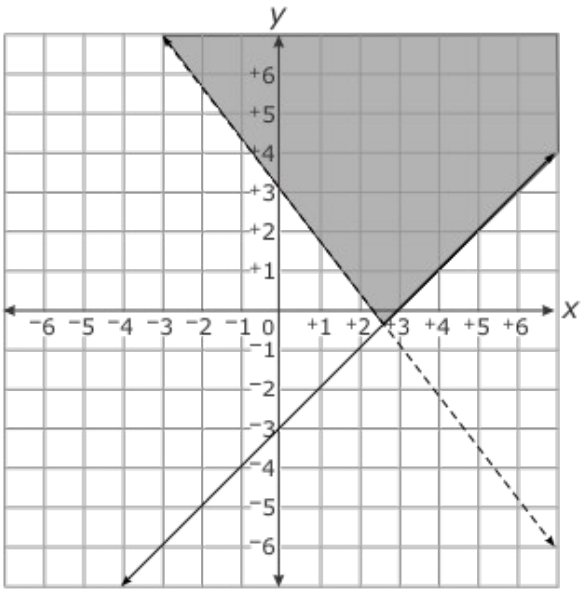

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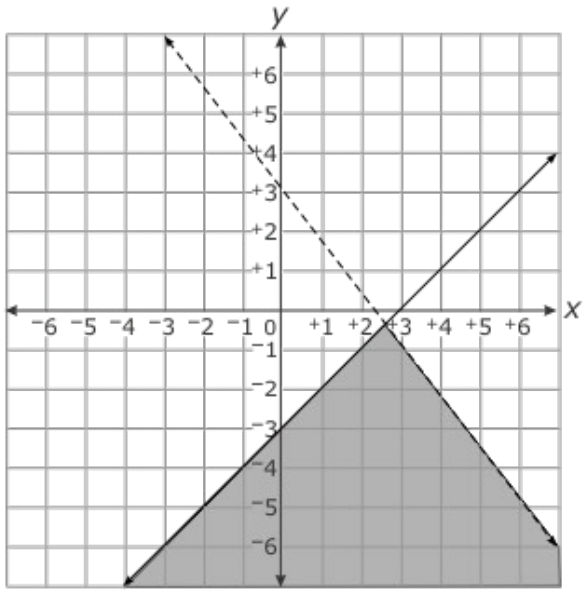

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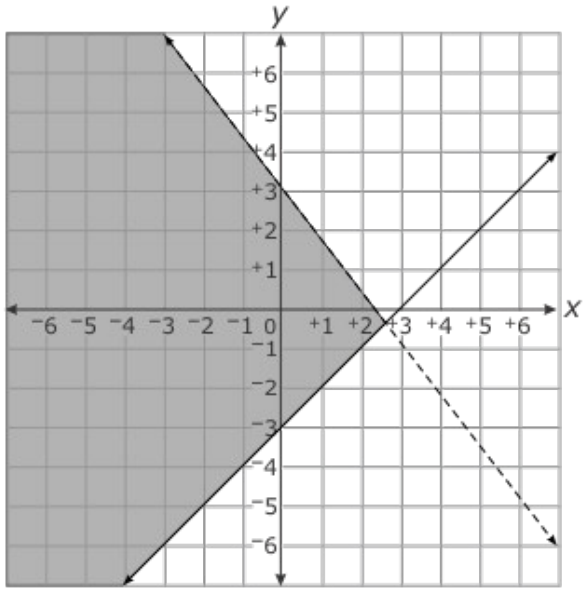


30. The function $f(x) = 120.882(1.012)^x$ models the population of a country, in millions, x years after 1930. What was the ***approximate*** population of the country in 1991?

A. 121.9 million

B. 122.3 million

C. 250.2 million

D. 253.3 million

31. The function $f(x) = 1(3)^x$ models the number of virus cells present in a sample after x minutes. ***About*** how many cells will be present after $1\frac{1}{2}$ minutes?

A. 3 cells

B. 4 cells

C. 5 cells

D. 7 cells

32. The table below shows the cost for a toy company to produce different amounts of toys.

Toys Produced	Cost
1,000	$122,000
3,000	$26,000
5,000	$10,000
7,000	$74,000

Assuming a quadratic relationship, ***about*** how many toys should the company produce to minimize costs?

A. 1,000

B. 4,000

C. 5,000

D. 6,000

33. The amount of profit a company makes from selling video games for x dollars is modeled by the function $P(x) = -x^2 + 100x + 350{,}000$. To the nearest dollar, what price gives the maximum profit?

A. $40.00

B. $45.00

C. $50.00

D. $55.00

34. The function $f(x)=3.33x$ models the cost for Juan to fill his car with x gallons of gas. Juan's car can hold a maximum of 17 gallons of gas. What is the ***most appropriate*** domain of the function?

A. $x \leq 17$

B. $x \leq 56.61$

C. $0 \leq x \leq 17$

D. $0 \leq x \leq 56.61$

35. The table below shows the number of miles Paul ran over five days.

Day	Miles Ran
1	1.5
2	0.75
3	2.5
4	1.25
5	2.5

What is the ***approximate*** average rate of change in the number of miles Paul ran from day 2 to day 5?

A. 0.4

B. 0.6

C. 1.7

D. 1.8

36. The table below shows the cost to rent a movie for different numbers of days at a movie rental store.

Days	Total Cost
3	$6.00
5	$8.50
6	$9.75
9	$13.50

What is the meaning of the rate of change for the data?

A. The cost to rent a movie increases by $1.25 for each additional day the movie is rented.

B. The cost to rent a movie increases by $2.00 for each additional day the movie is rented.

C. The cost to rent a movie increases by $2.50 for each additional day the movie is rented.

D. The cost to rent a movie increases by $2.75 for each additional day the movie is rented.

37. Suppose the equation $h(t) = {}^{-}t^{2} + 5t + 14$ models the height of a ball thrown into the air off the bleachers. Which statement about the flight of the ball is true?

A. The ball starts from a height of 19 feet.

B. The ball takes 5 seconds before it hits the ground.

C. The ball takes 14 seconds before it hits the ground.

D. The ball reaches a maximum height of 20.25 feet.

38. 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.

39. Jenny used the expression $^{-}16x^2 + 38x + 5$ to determine the height of an object x seconds after it was hit into the air. How long does it take the object to hit the ground?

A. $\frac{1}{8}$ second

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

C. 2.5 seconds

D. 8 seconds

40. A sequence is shown below.

$$^{-}20, ^{-}17, ^{-}14, ^{-}11, ^{-}8, \ldots$$

Which explicit equation could be used to determine the value of the nth term in the sequence?

A. $a_n = n + 3$

B. $a_n = 3n - 23$

C. $a_n = n - 23$

D. $a_n = ^{-}3n + 23$

41. Given the functions $f(x) = 3x^2 - 5x + 2$ and $g(x) = ^{-}4x^2 + 3$, what is $f(x) - g(x)$?

A. $^{-}x^2 + 5$

B. $^{-}x^2 - 5x + 5$

C. $7x^2 - 1$

D. $7x^2 - 5x - 1$

42. A ball is dropped out of a window of a building. The ball's height in feet can be represented by the function $h(t) = -16t^2 + 48$, where t is the time in seconds. If the height at which the ball is dropped is increased by 20 feet, what is the resulting function?

A. $h(t) = 4t^2 + 48$

B. $h(t) = -16t^2 + 68$

C. $h(t) = -36t^2 + 48$

D. $h(t) = -16t^2 + 20t + 48$

43. Which situation could be modeled by the equation $y = 1.5(1.01)^x$?

A. an oak tree that starts out 1.5 feet tall and grows by 1% annually

B. an oak tree that starts out 1.5 feet tall and grows by 1.01 feet annually

C. a tuna that starts out at 1.01 feet long and grows by 50% annually

D. a tuna that starts out at 1.01 feet long and grows by 1.5 feet annually

44. Which table of values represents a linear function?

A.

x	$f(x)$
4	12
5	15
6	18.75
7	23.4375

B.

x	$f(x)$
4	15
7	24
9	30
15	48

C.

x	$f(x)$
1	10
2	11
3	10
4	7

D.

x	$f(x)$
-1	3.375
0	4.5
1	6
2	8

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. Isaac rented a movie but forgot to return it on time. The table below shows the total amount of money that Isaac owed after different numbers of days.

Number of Days (x)	**Total Owed** (y)
1	$3.00
2	$4.25
3	$5.50
4	$6.75

Which function models the amount of money Isaac owed after x days?

A. $y = 1.25x + 1.75$

B. $y = 1.25x + 3$

C. $y = 1.25(3)^x$

D. $y = 3(1.25)^x$

47. Melissa and Steve bought new cars.

- The value of Melissa's car can be calculated using the function $f(x) = 16{,}000(0.9)^x$, where x is the number of years after the car was purchased.
- The value of Steve's car can be calculated using the function $f(x) = 18{,}000 - 1{,}500x$, where x is the number of years after the car was purchased.

After 7 years from the purchase of their cars, which statement below is true?

A. Melissa's car is worth about $150 more than Steve's car.

B. Steve's car is worth about $150 more than Melissa's car.

C. Melissa's car is worth about $1,500 more than Steve's car.

D. Steve's car is worth about $1,500 more than Melissa's car.

48. The function $f(x) = 37x + 20$ models the total cost for Rachel to be a member at a gym for x months. What can be interpreted from the y-intercept of the function?

A. Rachel must pay $37 per month to use the gym.

B. Rachel must pay $20 per month to use the gym.

C. Rachel must pay a $37 membership fee to join the gym.

D. Rachel must pay a $20 membership fee to join the gym.

49. Right triangle JKL has vertices located at $J(4, 3)$ and $K(2, \bar{}2)$. Which could be the coordinates of point L?

A. (0, 3)

B. (0, 0)

C. ($\bar{}1$, 0)

D. ($\bar{}3$, 0)

50. Which is an equation of the line that passes through the point (−3, 4) and is parallel to the graph of $x + 3y = -8$?

A. $y = \frac{-x}{3} + 3$

B. $y = -3x - 8$

C. $y = 3x + 3$

D. $y = \frac{x}{3} + 3$

51. The coordinates of the midpoint of a line segment are (9, −13). The coordinates of an endpoint of the segment are (−4, 5). What are the coordinates of the other endpoint?

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

B. $\left(\frac{5}{2}, -4\right)$

C. $(14, -21)$

D. $(22, -31)$

52. Alan has a cylindrical bottle that is 6 inches tall and has a 2-inch radius. How much taller must the bottle be in order to hold ***about*** 175 cubic inches of water?

A. 22 inches

B. 14 inches

C. 8 inches

D. 2 inches

53. Two students' test grades are recorded below.

- Seth: {95, 94, 89, 90, 91, 96, 97, 93}
- Nicole: {71, 73, 71, 72, 98, 95, 86, 79}

Based on these data sets, which statement below is true?

A. Seth had a higher standard deviation by about 2.2.

B. Seth had a higher standard deviation by about 8.2.

C. Nicole had a higher standard deviation by about 2.2.

D. Nicole had a higher standard deviation by about 8.2.

54. The data below represent the ages of several people in a class.

Person	Age
Mr. Smith	45
Sam	12
Chris	11
Lovell	13
Christina	12
Susan	12

What effect does Mr. Smith's age have on the data set?

A. Mr. Smith's age increases the mode of the data.

B. Mr. Smith's age decreases the mean of the data.

C. Mr. Smith's age increases the mean of the data.

D. Mr. Smith's age decreases the median of the data.

55. A restaurant cooked a total of 200 steaks on Saturday and Sunday. The table below shows the relative frequencies of steaks that were cooked rare, medium, and well-done on each day.

	Rare	Medium	Well-Done
Saturday	0.10	0.24	0.20
Sunday	0.12	0.32	0.02

What was the total number of steaks that were cooked Well-Done?

A. 22

B. 40

C. 44

D. 80

56. In a survey, 50 students were asked if they like scary movies. The relative frequency table below shows their responses.

	Yes	No
Boys	0.38	0.10
Girls	0.16	0.36

What percentage of the girls did not like scary movies?

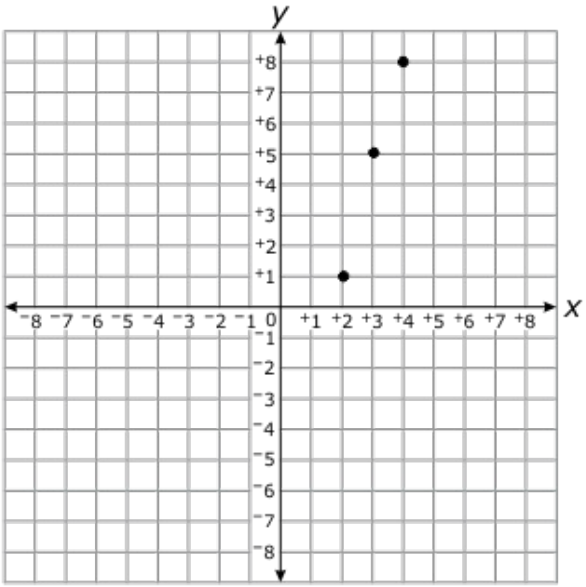
A. 21%

B. 36%

C. 69%

D. 78%

57. Using the graph, which is the ***approximate*** line of best fit for these data?



A. $y = 3x - 4$

B. $y = 3.5x - 5.8$

C. $y = 4x - 7$

D. $y = 4.5x - 10.2$

58. Anna is studying body proportions for a science project. She measured the height and head circumference of 10 people in her class. The results are shown in the table below.

Height (inches)	**Head Circumference** (inches)
60	8.5
67	9.5
68	9.5
62	9.0
71	10.5
70	10.0
61	8.5
70	10.0
65	9.0
66	9.5

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

A. For every 1 inch increase in height, there is about a 6 inch increase in head circumference.

B. For every 1 inch increase in head circumference, there is about a 6 inch increase in height.

C. For every 1 inch increase in head circumference, there is about a 1 inch increase in height.

D. For every $\frac{1}{6}$ inch increase in height, there is about a 6 inch increase in head circumference.

59. 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.

60. A scatterplot has a line of best fit with a correlation coefficient of 0.18. Which statement ***best*** describes the data?

A. The data has a weak negative correlation.

B. The data has a strong positive correlation.

C. The line of best fit is a good representation for the set of data.

D. The line of best fit is not closely aligned to the data set.