

Algebra I Regents at Random Worksheets

- 1 A ball was launched into the air, and its height above the ground was recorded each second, as shown in the table below.

Time (sec)	0	1	2	3	4
Height (ft)	11	59	75	59	11

Based on these data, which statement is a valid conclusion?

- 1) The ball lands on the ground at 4 seconds.
 2) The ball reaches a maximum height of 11 feet.
 3) The ball was launched from a height of 0 feet.
 4) The ball reaches its maximum height at 2 seconds.

- 2 The expression $-2(x^2 - 2x + 1) + (3x^2 + 3x - 5)$ is equivalent to

- 1) $x^2 + x - 4$
 2) $x^2 - x - 7$
 3) $x^2 + 7x - 4$
 4) $x^2 + 7x - 7$

- 3 Nancy has just been hired for her first job. Her company gives her four choices for how she can collect her annual salary over the first eight years of employment. Each function below represents the four choices she has for her annual salary in thousands of dollars, where t represents the number of years after she is hired.

$$a(t) = 2^t + 25$$

$$b(t) = 10t + 75$$

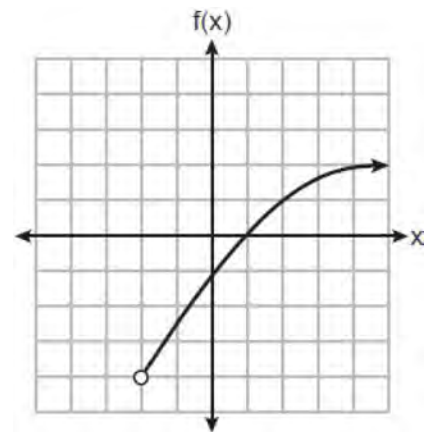
$$c(t) = \sqrt{400t} + 80$$

$$d(t) = 2(t + 1)^2 - 10t + 50$$

Which pay plan should Nancy choose in order to have the highest salary in her eighth year?

- 1) $a(t)$
 2) $b(t)$
 3) $c(t)$
 4) $d(t)$

- 4 A function is graphed on the set of axes below.



The domain of this function is

- 1) $\{x | x > -2\}$
 2) $\{x | x \geq -2\}$
 3) $\{x | x > -4\}$
 4) $\{x | x \geq -4\}$
- 5 Use the method of completing the square to determine the exact values of x for the equation $x^2 + 10x - 30 = 0$.

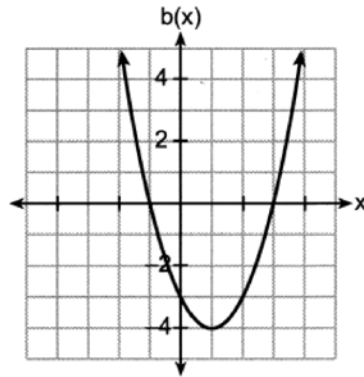
6 Four quadratic functions are represented below.

$$a(x) = (x - 3)^2 - 7$$

I

$$c(x) = x^2 + 6x + 3$$

III



II

x	d(x)
-4	-1
-3	-4
-2	-5
-1	-4
0	-1

IV

Which function has the *smallest* minimum value?

- 1) I
- 2) II
- 3) III
- 4) IV

7 Courtney went to a coffee shop to purchase lattes and donuts for her friends. One day she spent a total of \$15.50 on four lattes and two donuts. The next day she spent a total of \$18.10 on three lattes and five donuts. All prices included tax. If x represents the cost of one latte and y represents the cost of one donut, write a system of equations that can be used to model this situation. Courtney thinks that one latte costs \$2.75 and one donut costs \$2.25. Is Courtney correct? Justify your answer. Use your equations to determine algebraically the exact cost of one latte and the exact cost of one donut.

9 The equation that represents the sequence $-2, -5, -8, -11, -14, \dots$ is

- 1) $a_n = -3 + (-2)(n - 1)$
- 2) $a_n = -2 + (-3)(n - 1)$
- 3) $a_n = 3 + (-2)(n - 1)$
- 4) $a_n = -2 + (3)(n - 1)$

10 Which equation represents the line that passes through the points $(-1, 8)$ and $(4, -2)$?

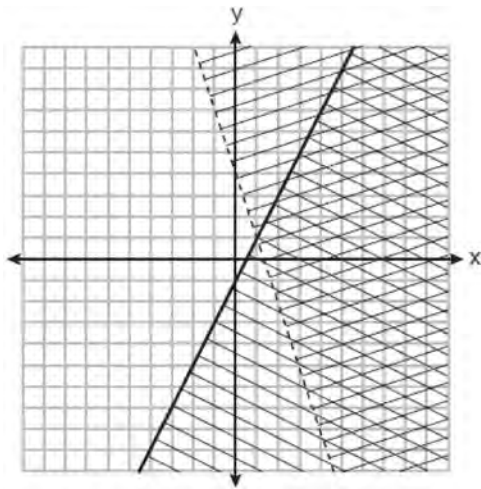
- 1) $y = -2x + 6$
- 2) $y = -2x + 10$
- 3) $y = -0.5x + 7.5$
- 4) $y = -0.5x + 8.5$

8 Solve $5(x - 2) \leq 3x + 20$ algebraically.

- 11 A survey of 150 students was taken. It was determined that $\frac{2}{3}$ of the students play video games. Of the students that play video games, 85 also use social media. Of the students that do not play video games, 20% do not use social media. Complete the two-way frequency table.

	Play Video Games	Do Not Play Video Games	Total
Social Media			
No Social Media			
Total			

- 12 A system of inequalities is graphed on the set of axes below.



Which point is a solution to this system?

- 1) (1, 1)
 - 2) (2, -2)
 - 3) (1, 8)
 - 4) (4, 2)
- 13 Using the quadratic formula, solve $x^2 + 4x - 3 = 0$. Express your solution in simplest radical form.

- 14 Factor $5x^3 - 80x$ completely.

- 15 The sum of $2\sqrt{54}$ and $2\sqrt{6}$ is

- 1) $4\sqrt{60}$
- 2) $8\sqrt{15}$
- 3) $7\sqrt{6}$
- 4) $8\sqrt{6}$

- 16 When solving $-2(3x - 5) = \frac{9}{2}x - 2$ for x , the solution is

- 1) $\frac{8}{7}$
- 2) $\frac{10}{11}$
- 3) $-\frac{16}{21}$
- 4) $-\frac{16}{3}$

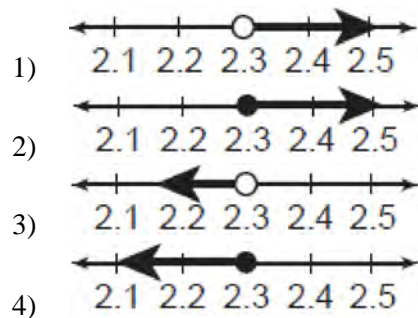
- 17 Use the quadratic formula to determine the exact roots of the equation $x^2 + 3x - 6 = 0$.

- 18 The owner of an ice cream stand kept track of the number of ice cream cones that were sold each day of the first week in June. She compared the ice cream sales to the average daily temperature. The data are shown in the table below.

Average Daily Temp. (x)	72	75	81	78	77	76	80
Daily Ice Cream Cone Sales (y)	126	183	263	229	200	185	249

State the linear regression equation for these data, rounding all values to the *nearest hundredth*. State the correlation coefficient, to the *nearest hundredth*, for the line of best fit for these data. State what this correlation coefficient indicates about the linear fit of the data.

- 19 Which graph is the solution to the inequality $6.4 - 4x \geq -2.8$?



- 20 The number of fish in a pond is eight more than the number of frogs. The total number of fish and frogs in the pond is at least 20. If x represents the number of frogs, which inequality can be used to represent this situation?

- 1) $x + 8x \geq 20$
 2) $2x + 8 \geq 20$
 3) $x + 8x \leq 20$
 4) $2x + 8 \leq 20$

- 21 Given the relation $R = \{(-1, 1), (0, 3), (-2, -4), (x, 5)\}$. State a value for x that will make this relation a function. Explain why your answer makes this a function.

- 22 Wayde van Niekerk, a runner from South Africa, ran 400 meters in 43.03 seconds to set a world record. Which calculation would determine his average speed, in miles per hour?

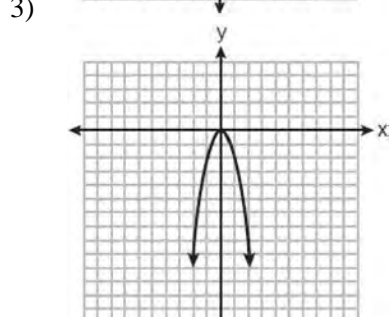
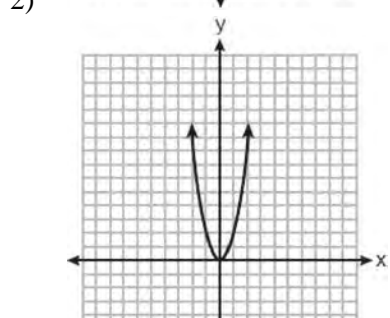
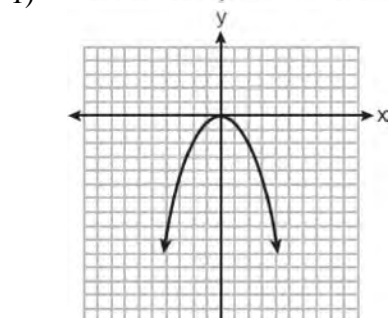
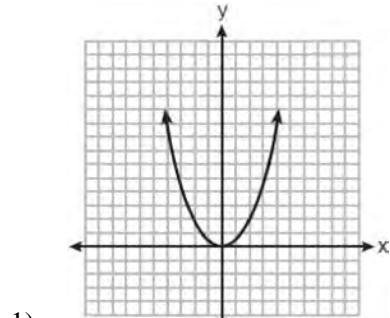
- 1) $\frac{400 \text{ m}}{43.03 \text{ sec}} \cdot \frac{1000 \text{ m}}{0.62 \text{ mi}} \cdot \frac{1 \text{ hr}}{3600 \text{ sec}}$
 2) $\frac{400 \text{ m}}{43.03 \text{ sec}} \cdot \frac{0.62 \text{ mi}}{1000 \text{ m}} \cdot \frac{1 \text{ hr}}{3600 \text{ sec}}$
 3) $\frac{400 \text{ m}}{43.03 \text{ sec}} \cdot \frac{0.62 \text{ mi}}{1000 \text{ m}} \cdot \frac{3600 \text{ sec}}{1 \text{ hr}}$
 4) $\frac{400 \text{ m}}{43.03 \text{ sec}} \cdot \frac{1000 \text{ m}}{0.62 \text{ mi}} \cdot \frac{3600 \text{ sec}}{1 \text{ hr}}$

- 23 What is an equation of the line that passes through the points $(2, 7)$ and $(-1, 3)$?

- 1) $y - 2 = \frac{3}{4}(x - 7)$
 2) $y - 2 = \frac{4}{3}(x - 7)$
 3) $y - 7 = \frac{3}{4}(x - 2)$
 4) $y - 7 = \frac{4}{3}(x - 2)$

- 24 Given $g(x) = x^3 + 2x^2 - x$, evaluate $g(-3)$.

25 The function $f(x) = x^2$ is multiplied by k , where $k < -1$. Which graph could represent $g(x) = kf(x)$?

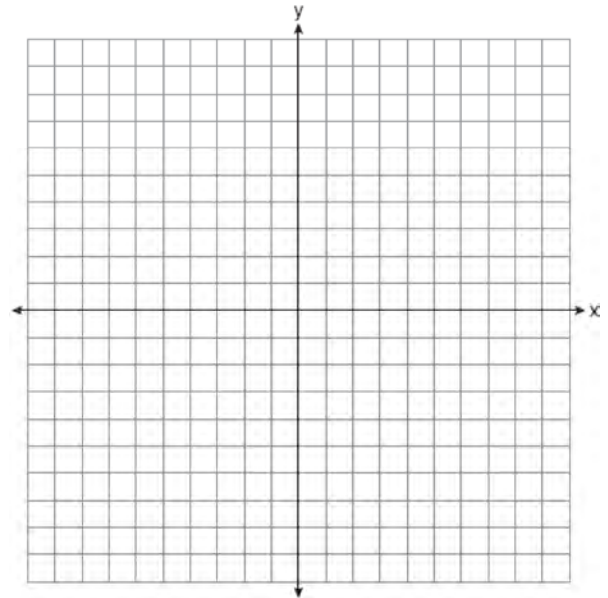


26 Solve algebraically for x : $0.05(x - 3) = 0.35x - 7.5$

27 Graph the system of inequalities on the set of axes below.

$$3y + 2x \leq 15$$

$$y - x > 1$$



State the coordinates of a point in the solution to this system. Justify your answer.

28 The amount of money a plumber charges is represented by the function $p(h) = 45 + 90h$. The best interpretation of the y -intercept of this function is that the plumber charges

- 1) \$45 to come to the house
- 2) \$45 per hour that he works
- 3) \$90 to come to the house
- 4) \$90 per hour that he works

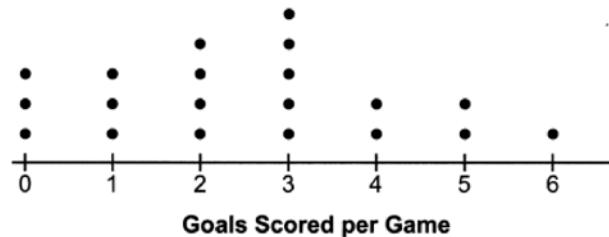
- 29 Explain why the relation shown in the table below is a function.

x	-1	0	1	2
y	2	4	4	5

Complete the table below with values for both x and y so that this new relation is *not* a function.

x	-1	0	1	2	
y	2	4	4	5	

- 30 The dot plot below shows the number of goals Jessica scored in each lacrosse game last season.



Which statement about the dot plot is correct?

- 1) mean > mode
 2) mean = median
 3) mode = median
 4) median > mean
- 31 What is the y -intercept of the line that passes through the points $(-1, 5)$ and $(2, -1)$?
- 1) -1
 2) -2
 3) 3
 4) 5
- 32 Use the quadratic formula to solve the equation $3x^2 - 10x + 5 = 0$. Express the answer in simplest radical form.
- 33 Alex had \$1.70 in nickels and dimes on his desk. There were 25 coins in all. Write a system of equations that could be used to determine both the number of nickels, n , and the number of dimes, d , that Alex had. Use your system of equations to algebraically determine both the number of nickels and the number of dimes that he had.
- 34 If $f(x) = \frac{-3x - 5}{2}$, algebraically determine the value of x when $f(x) = -22$.

- 35 A bookstore owner recorded the number of books sold and the profit made selling the books.

Books Sold	Profit
100	\$50.00
250	\$275.00
300	\$350.00
350	\$425.00

What is the average rate of change, in dollars per book, between 100 and 350 books sold?

- 1) 0.50
2) 0.67
3) 1.50
4) 2.00

- 36 Which ordered pair is a solution to the equation

$$y - 1 = 2\left(x + \frac{1}{4}\right)?$$

- 1) (0.75, 0)
2) (1.25, 4)
3) (2.5, -6.5)
4) (4, -9.5)

- 39 Which expression results in an irrational number?

- 1) $\sqrt{3} \cdot \sqrt{3}$
2) $-\frac{2}{3} + \frac{1}{4}$
3) $5 \cdot \sqrt{81}$
4) $\frac{1}{3} + \sqrt{3}$

- 37 The third term in a sequence is 25 and the fifth term is 625. Which number could be the common ratio of the sequence?

- 1) $\frac{1}{5}$
2) 5
3) $\frac{1}{25}$
4) 25

- 40 Which situation can be modeled by a linear function?

- 1) A printer can print one page every three seconds.
2) A bank account earns 0.5% interest each year, compounded annually.
3) The number of cells in an organism doubles every four days.
4) The attendance at a professional sports team's games decreases by 1.5% each year.

- 38 Which expression is equivalent to

$$(5x^2 - 2x + 4) - (3x^2 + 3x - 1)?$$

- 1) $2x^2 + x + 3$
2) $2x^2 - 5x + 5$
3) $2x^4 + x^2 + 3$
4) $2x^4 - 5x^2 + 5$

- 41 The solution to $\frac{4(x-5)}{3} + 2 = 14$ is

- 1) 15
2) 14
3) 6
4) 4

42 The inputs and outputs of a function are shown in the table below.

x	$f(x)$
0	0.0625
1	0.125
2	0.25
3	0.5
4	1
5	2

This function can best be described as

- 1) linear
2) quadratic
3) exponential
4) absolute value

43 Which sum is irrational?

- 1) $-2\sqrt{12} + \sqrt{100}$
2) $-\sqrt{4} + \frac{1}{3}\sqrt{900}$
3) $\frac{1}{2}\sqrt{25} + \sqrt{64}$
4) $\sqrt{49} + 3\sqrt{121}$

44 Which expression is equivalent to

$$3(x^2 - 2x + 3) - (4x^2 + 3x - 1)?$$

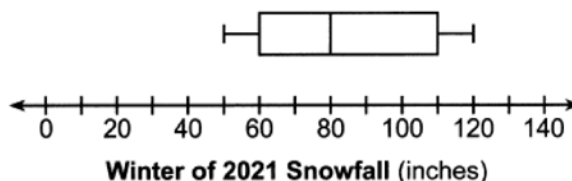
- 1) $-x^2 + x + 2$
2) $-x^2 - 8x + 7$
3) $-x^2 - 3x + 8$
4) $-x^2 - 9x + 10$

45 The functions $f(x) = x^2 - 5x - 14$ and $g(x) = x + 2$ are graphed on the same set of axes. What are the solutions to the equation $f(x) = g(x)$?

- 1) -14 and 0
2) 0 and 2
3) -2 and 8
4) -2 and 7

46 Use the method of completing the square to determine the exact values of x for the equation $x^2 + 6x - 41 = 0$. Express your answer in simplest radical form.

47 The box plot below summarizes the data for the amount of snowfall, in inches, during the winter of 2021 for 12 locations in western New York.



What is the interquartile range?

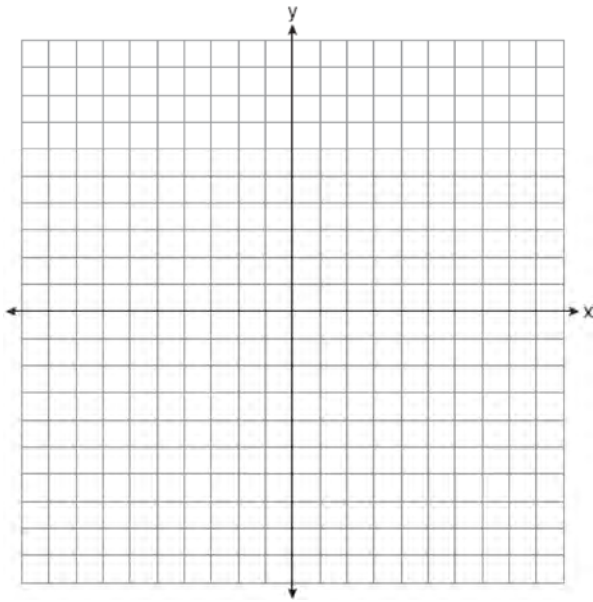
- 1) 30
2) 50
3) 80
4) 110

48 Factor $20x^3 - 45x$ completely.

55 Which function has the zeros -1 , 3 , and -4 ?

- 1) $f(x) = (x + 1)(x - 3)(x - 4)$
- 2) $g(x) = (x - 1)(x + 3)(x - 4)$
- 3) $h(x) = (x + 1)(x - 3)(x + 4)$
- 4) $k(x) = (x - 1)(x + 3)(x + 4)$

56 On the set of axes below, graph $f(x) = x^2 + 4x + 1$.



State the coordinates of the minimum.

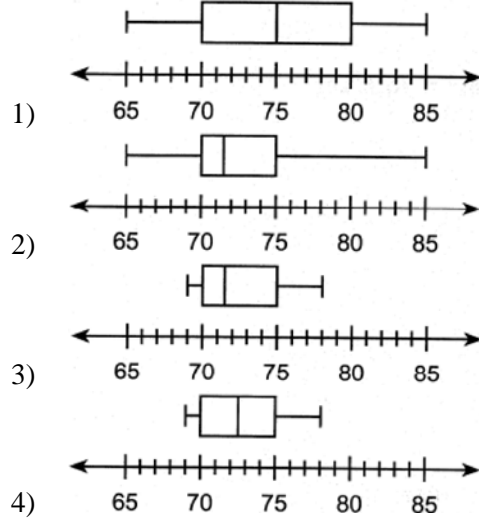
57 Elena's fastest time for the 50-meter dash is 7 seconds. She wants to know how fast this is in inches per minute. Which expression can Elena use for a correct conversion?

- 1) $\frac{7 \text{ sec}}{50 \text{ meters}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{1 \text{ meter}}{39.37 \text{ in}}$
- 2) $\frac{7 \text{ sec}}{50 \text{ meters}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} \cdot \frac{39.37 \text{ in}}{1 \text{ meter}}$
- 3) $\frac{50 \text{ meters}}{7 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{1 \text{ meter}}{39.37 \text{ in}}$
- 4) $\frac{50 \text{ meters}}{7 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{39.37 \text{ in}}{1 \text{ meter}}$

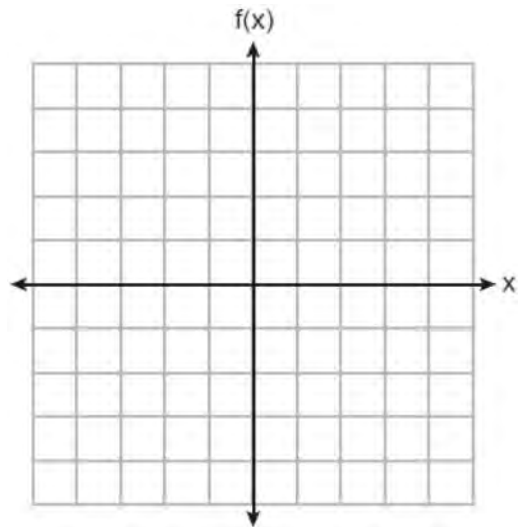
58 The heights, in inches, of eight football players are given below.

76, 70, 72, 70, 69, 71, 78, 74

Which box plot represents these data?



59 Graph the function $f(x) = x^2 + 4x + 3$.



State the equation of the axis of symmetry of $f(x)$.

60 What is an equation of the line that passes through (3,7) and has a slope of 2?

- 1) $y - 7 = 2(x - 3)$
- 2) $y - 3 = 2(x - 7)$
- 3) $y + 7 = 2(x + 3)$
- 4) $y + 3 = 2(x + 7)$

61 Jen joined the Fan Favorite Movie Club at the local movie theater. At this theater, the cost of admission in May and June remains the same. In May, she saw 2 matinees and 3 regular-priced shows and spent \$38.50. In June, she went to 6 matinees and one regular-priced show and spent \$47.50. Write a system of equations to represent the cost, m , of a matinee ticket and the cost, r , of a regular-priced ticket. Jen said she spent \$5.75 on each matinee and \$9 on each regular show. Is Jen correct? Justify your answer. Use your system of equations to algebraically determine both the actual cost of each matinee ticket and the actual cost of each regular ticket.

62 Solve the systems of equations algebraically for all values of x and y :

$$y = x^2 + 4x - 1$$
$$y = 2x + 7$$

63 Solve the following systems of equations algebraically for all values of x and y :

$$y = x^2 + 5x - 17$$
$$x - y = 5$$

64 Rationalize: $\frac{3}{2\sqrt{6}}$

65 What is the constant term of the polynomial

$$2x^3 - x + 5 + 4x^2?$$

- 1) 5
- 2) 2
- 3) 3
- 4) 4

66 Which function has a domain of all real numbers and a range greater than or equal to three?

- 1) $f(x) = -x + 3$
- 2) $g(x) = x^2 + 3$
- 3) $h(x) = 3^x$
- 4) $m(x) = |x + 3|$

67 What is the sum of $3x\sqrt{7}$ and $2x\sqrt{7}$?

- 1) $5x\sqrt{7}$
- 2) $5x^2\sqrt{7}$
- 3) $5x\sqrt{14}$
- 4) $5x^2\sqrt{14}$

68 The expression x^{2a+b} is equivalent to

- 1) $x^{2a} + x^b$
- 2) $x^a + x^{a+b}$
- 3) $x^a \bullet x^{a+b}$
- 4) $x^{a+b} \bullet x^{a+b}$

- 69 What is the correct factorization of $x^2 + 4x - 12$?
- 1) $(x + 3)(x - 4)$
 - 2) $(x - 3)(x + 4)$
 - 3) $(x + 2)(x - 6)$
 - 4) $(x - 2)(x + 6)$

- 70 When the formula $p = 2l + 2w$ is solved for w , the result is

- 1) $w = \frac{2l + p}{2}$
- 2) $w = \frac{p - 2l}{2}$
- 3) $w = \frac{p}{2} + l$
- 4) $w = l - \frac{p}{2}$

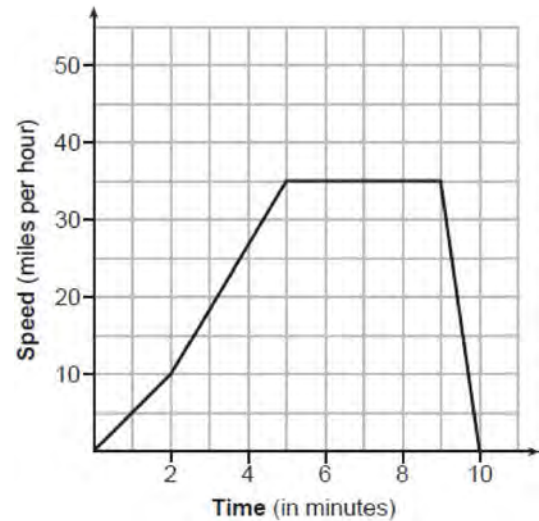
- 71 When babysitting, Nicole charges an hourly rate and an additional charge for gas. She uses the function $C(h) = 6h + 5$ to determine how much to charge for babysitting. The constant term of this function represents

- 1) the additional charge for gas
- 2) the hourly rate Nicole charges
- 3) the number of hours Nicole babysits
- 4) the total Nicole earns from babysitting

- 72 When factored, the expression $x^3 - 36x$ is equivalent to

- 1) $(x + 6)(x - 6)$
- 2) $(x + 18)(x - 18)$
- 3) $x(x + 6)(x - 6)$
- 4) $x(x + 18)(x - 18)$

- 73 The graph below models Sally's drive to the store.



State an interval when Sally is traveling at a constant speed. Explain your reasoning.

- 74 Stephanie is solving the equation $x^2 - 12 = 7x - 8$. Her first step is shown below.

Given: $x^2 - 12 = 7x - 8$

Step 1: $x^2 - 4 = 7x$

Which property justifies her first step?

- 1) associative property
- 2) commutative property
- 3) distributive property
- 4) addition property of equality

- 75 What is the sum of $8\sqrt{3}$ and $\sqrt{3}$?

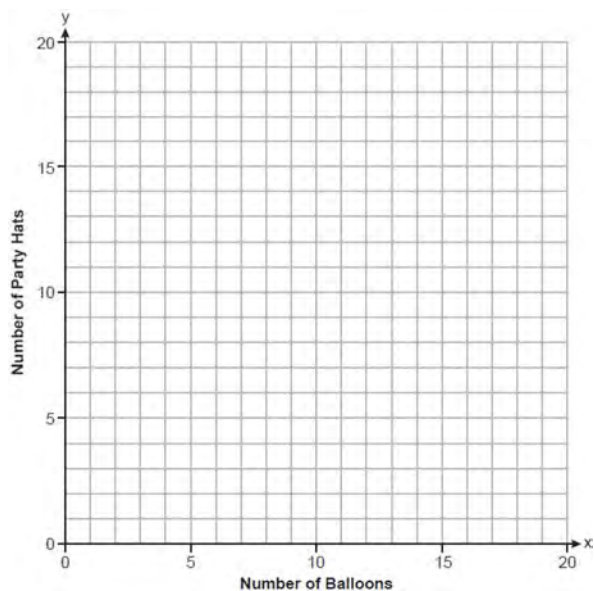
- 1) $8\sqrt{6}$
- 2) $9\sqrt{6}$
- 3) $7\sqrt{3}$
- 4) $9\sqrt{3}$

- 76 The table below shows the average heart rate, x , and Calories burned, y , for seven men on an Olympic rowing team during a one-hour workout class.

Average Heart Rate (x)	135	147	150	144	146	153	143
Calories Burned (y)	725	812	866	761	825	863	737

Write the linear regression equation that models these data, rounding all values to the *nearest tenth*. State the correlation coefficient, rounded to the *nearest tenth*. State what the correlation coefficient suggests about the linear fit of these data.

- 77 Anna plans to spend \$30 on balloons and party hats for her daughter's birthday party. Including tax, balloons cost \$2 each and party hats cost \$1.50 each. The number of party hats Anna needs is twice as many as the number of balloons. If x represents the number of balloons and y represents the number of party hats, write a system of equations that can be used to represent this situation. Graph your system of equations on the set of axes below.



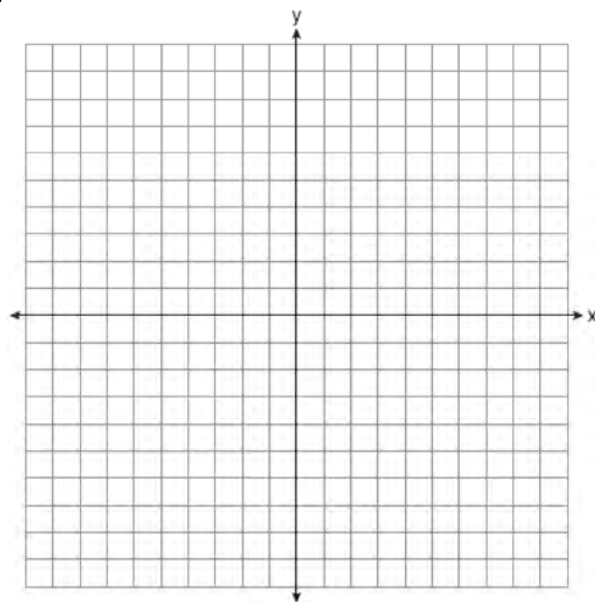
State the coordinates of the point of intersection of your lines. Explain what each coordinate means in the context of the problem.

- 78 Graph the system of inequalities on the set of axes below:

$$y > 3x - 4$$

$$x + 2y \leq 6$$

Label the solution set S .



Is the point $(2, 2)$ a solution to the system? Justify your answer.

- 79 Solve $x^2 + 8x = 33$ for x by completing the square.

88 The table below shows the highest temperatures recorded in August for several years in one town.

Year	Temperature (°F)
1990	86
1991	78
1992	84
1993	95
1994	81
1995	77
1996	88
1997	93

The interquartile range of these data is

- 1) 7
2) 10
3) 11
4) 18

89 Which equation has the same solutions as

$$x^2 + 6x - 18 = 0?$$

- 1) $(x + 3)^2 = 24$
2) $(x + 3)^2 = 27$
3) $(x + 6)^2 = 24$
4) $(x + 6)^2 = 27$

92 A student creates a fourth-degree trinomial with a leading coefficient of 2 and a constant value of 5. The trinomial could be

- 1) $2x^4 + 3x^2 + 5$
2) $2x^4 + 5x + 3$
3) $4x^2 - 3x + 5$
4) $4x^3 - 5x^2 + 3$

90 On an island, a rare breed of rabbit doubled its population each month for two years. Which type of function best models the increase in population at the end of two years?

- 1) linear growth
2) linear decay
3) exponential growth
4) exponential decay

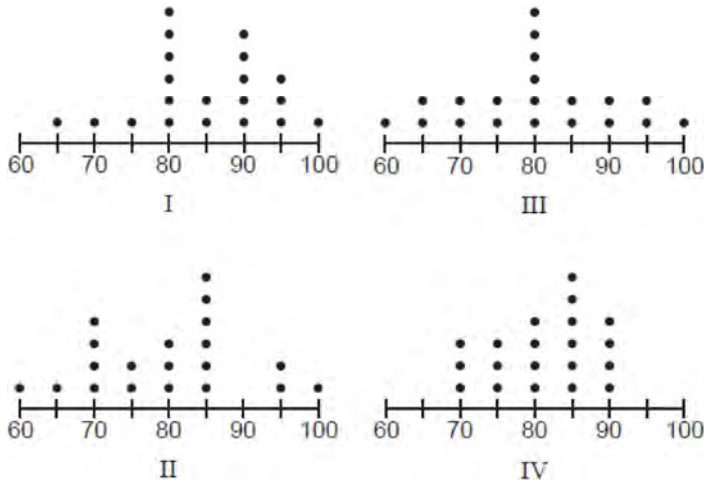
93 At Adelynn's first birthday party, each guest brought \$1 in coins for her piggy bank. Guests brought nickels, dimes, and quarters for a total of \$28. There were twice as many dimes as nickels and 12 more quarters than nickels. Which equation could be used to determine the number of nickels, x , that her guests brought to her party?

- 1) $.05x + .10x + .25x = 28$
2) $.05x + .10(2x) + .25(x + 12) = 28$
3) $.05(2x) + .10x + .25(x + 12) = 28$
4) $.05(x + 12) + .10(2x) + .25x = 28$

91 Rationalize the denominator of the fraction below. Express the solution in simplest form.

$$\frac{4}{\sqrt{2}}$$

94 The dot plots below represent test scores for 20 students on a math test.



The mode for this math test is 80 and the median is 85. Which dot plot correctly represents this data?

- 1) I
2) II
3) III
4) IV

95 A tour bus can seat, at most, 48 passengers. An adult ticket costs \$18 and a child ticket costs \$12. The bus company must collect at least \$650 to make a profit. If a represents the number of adult tickets sold and c represents the number of child tickets sold, which system of inequalities models this situation if they make a profit?

- 1) $a + c < 48$
 $18a + 12c > 650$
2) $a + c \leq 48$
 $18a + 12c \geq 650$
3) $a + c < 48$
 $18a + 12c < 650$
4) $a + c \leq 48$
 $18a + 12c \leq 650$

96 Which equation is always true?

- 1) $x^2 \cdot x^3 = x^5$
2) $3^x \cdot 3^2 = 9^{2x}$
3) $-z^2 = z^2$
4) $7^a \cdot 7^b = 7^{ab}$

97 If $x = 4a^2 - a + 3$ and $y = a - 5$, then which polynomial is equivalent to the product of x and y ?

- 1) $-17a^2 - 2a - 15$
2) $-17a^2 + 8a - 15$
3) $4a^3 - 21a^2 - 2a - 15$
4) $4a^3 - 21a^2 + 8a - 15$

- 98 The table below shows the amount of money a popular movie earned, in millions of dollars, during its first six weeks in theaters.

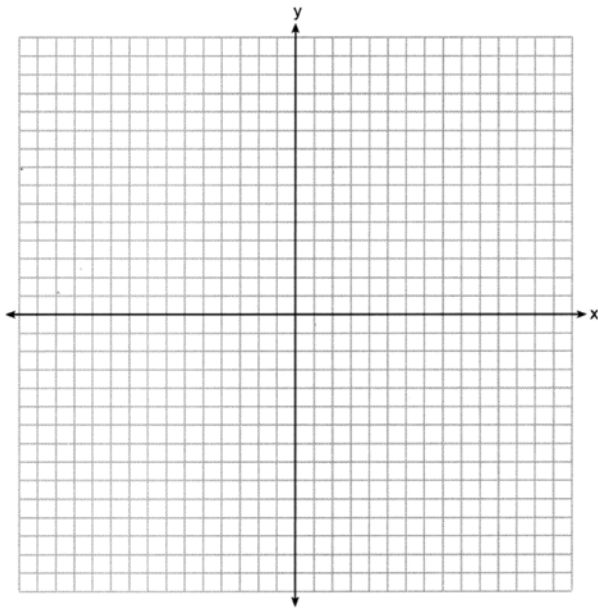
Week (x)	1	2	3	4	5	6
Dollars Earned, in Millions (y)	185	150	90	50	25	5

Write the linear regression equation for this data set, rounding all values to the *nearest hundredth*. State the correlation coefficient to the *nearest hundredth*. State what this correlation coefficient indicates about the linear fit of the data.

- 99 Graph the following system of equations on the set of axes below.

$$y = x^2 - 3x - 6$$

$$y = x - 1$$



State the coordinates of all solutions.

- 100 The zeros of the function $f(x) = x(x - 5)(3x + 6)$ are

- 1) 0, -5, and 2
- 2) 0, 5, and -2
- 3) -5 and 2, only
- 4) 5 and -2, only

- 101 Joe is ordering water for his swimming pool. He determines the volume of his pool to be about 3240 cubic feet. There are approximately 7.5 gallons of water in 1 cubic foot. A truck load holds 6000 gallons of water. Which expression would allow Joe to correctly calculate the number of truck loads of water he needs to fill his pool?

- 1) $\frac{3240 \text{ ft}^3}{1 \text{ pool}} \cdot \frac{1 \text{ ft}^3}{7.5 \text{ gal}} \cdot \frac{6000 \text{ gal}}{1 \text{ truck load}}$
- 2) $\frac{3240 \text{ ft}^3}{1 \text{ pool}} \cdot \frac{1 \text{ ft}^3}{7.5 \text{ gal}} \cdot \frac{1 \text{ truck load}}{6000 \text{ gal}}$
- 3) $\frac{3240 \text{ ft}^3}{1 \text{ pool}} \cdot \frac{7.5 \text{ gal}}{1 \text{ ft}^3} \cdot \frac{6000 \text{ gal}}{1 \text{ truck load}}$
- 4) $\frac{3240 \text{ ft}^3}{1 \text{ pool}} \cdot \frac{7.5 \text{ gal}}{1 \text{ ft}^3} \cdot \frac{1 \text{ truck load}}{6000 \text{ gal}}$

102 The function $f(x)$ is shown in the table below.

x	0	3	2	6	1	5	4	m
$f(x)$	6	2	7	5	8	4	3	9

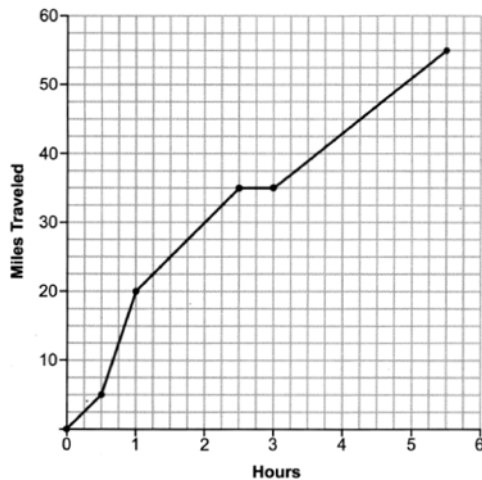
State an appropriate value for m in the table, so that $f(x)$ remains a function. Explain your reasoning.

103 Solve the following system of equations algebraically for all values of x and y :

$$y = x^2 - 7x + 12$$

$$y = 2x - 6$$

104 One Saturday, Dave took a long bike ride. The graph below models his trip.



What was Dave's average rate of change, in miles per hour, on this trip?

- 1) 10
- 2) 11
- 3) 11.6
- 4) 14.5

105 When the equation $6 - ax = ax - 2$ is solved for x in terms of a , and $a \neq 0$, the result is

- 1) $4a$
- 2) $\frac{4}{a}$
- 3) $2a$
- 4) $\frac{2}{a}$

106 The students in Mrs. Smith's algebra class were asked to describe the graph of $g(x) = 2(x - 3)^2$ compared to the graph of $f(x) = x^2$. Which student response is correct?

- 1) Ashley said that the graph of $g(x)$ is wider and shifted left 3 units.
- 2) Beth said that the graph of $g(x)$ is narrower and shifted left 3 units.
- 3) Carl said that the graph of $g(x)$ is wider and shifted right 3 units.
- 4) Don said that the graph of $g(x)$ is narrower and shifted right 3 units.

107 An object is launched upward at 64 feet per second from a platform 80 feet above the ground. The function $s(t)$ models the height of the object t seconds after launch. If $s(t) = -16t^2 + 64t + 80$, state the vertex of $s(t)$, and explain in detail what each coordinate means in the context of the problem. After the object is launched, how many seconds does it take for the object to hit the ground? Justify your answer.

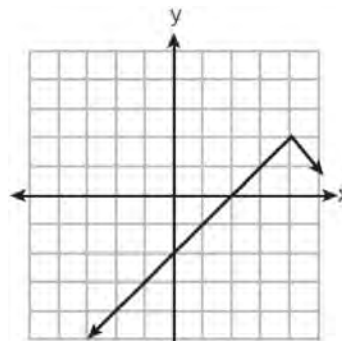
108 A landscaping company charges a set fee for a spring cleanup, plus an hourly labor rate. The total cost is modeled by the function $C(x) = 55x + 80$. In this function, what does the 55 represent?

- 1) the set fee for the cleanup
- 2) the hourly labor rate for a cleanup
- 3) the profit earned by the company for one cleanup
- 4) the number of hours of labor required for one cleanup

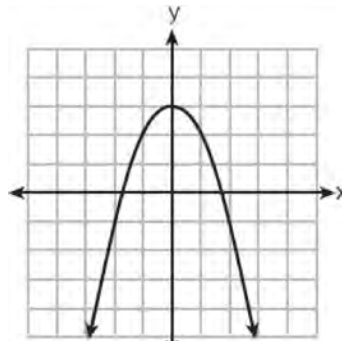
109 Which expression is equivalent to $(x - 5)(2x + 7) - (x + 5)$?

- 1) $2x^2 - 2x - 30$
- 2) $2x^2 - 2x - 40$
- 3) $2x^2 - 4x - 30$
- 4) $2x^2 - 4x - 40$

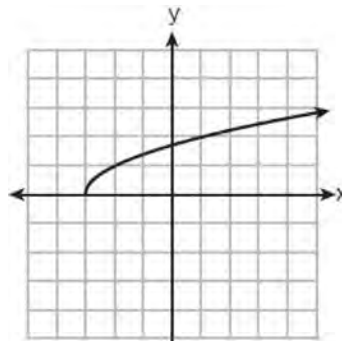
110 Which graph below represents a function that is always *decreasing* over the entire interval $-3 < x < 3$?



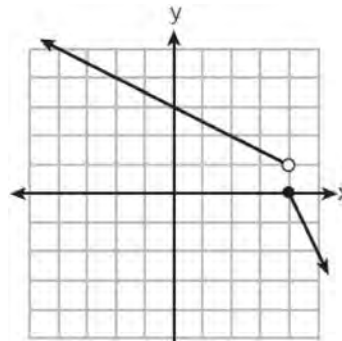
1)



2)



3)



4)

Algebra I Regents at Random Worksheets

Answer Section

1 ANS: 4 PTS: 2 REF: 062401ai NAT: F.IF.B.4
TOP: Graphing Quadratic Functions KEY: key features

2 ANS: 4
 $-2x^2 + 4x - 2 + 3x^2 + 3x - 5 = x^2 + 7x - 7$

PTS: 2 REF: 062404ai NAT: A.APR.A.1 TOP: Operations with Polynomials
KEY: addition

3 ANS: 1
 $a(8) = 2^8 + 25 = 281$ $b(8) = 10(8) + 75 = 155$ $c(8) = \sqrt{400(8)} + 80 \approx 137$ $d(8) = 2(8 + 1)^2 - 10(8) + 50 = 132$

PTS: 2 REF: 062411ai NAT: F.LE.A.3 TOP: Families of Functions

4 ANS: 1 PTS: 2 REF: 012517ai NAT: F.IF.B.5
TOP: Domain and Range KEY: graph

5 ANS:
 $x^2 + 10x = 30$
 $x^2 + 10x + 25 = 30 + 25$

$$(x + 5)^2 = 55$$

$$x + 5 = \pm\sqrt{55}$$

$$x = -5 \pm \sqrt{55}$$

PTS: 2 REF: 062429ai NAT: A.REI.B.4 TOP: Solving Quadratics
KEY: completing the square

6 ANS: 1
1) -7; 2) -4; 3) $x = \frac{-6}{2(1)} = -3$, $c(-3) = (-3)^2 + 6(-3) + 3 = -6$; 4) -5

PTS: 2 REF: 062414ai NAT: F.IF.C.9 TOP: Comparing Quadratic Functions

7 ANS:
 $4x + 2y = 15.5$ $5(4x + 2y = 15.5)$ Courtney is incorrect because of the following calculations: $20x + 10y = 77.5$
 $3x + 5y = 18.1$ $2(3x + 5y = 18.1)$ $6x + 10y = 36.2$
 $14x = 41.3$
 $x = 2.95$

$$4(2.95) + 2y = 15.5$$

$$11.8 + 2y = 15.5$$

$$2y = 3.7$$

$$y = 1.85$$

PTS: 6 REF: 062435ai NAT: A.CED.A.3 TOP: Modeling Linear Systems

8 ANS:

$$5x - 10 \leq 3x + 20$$

$$2x \leq 30$$

$$x \leq 15$$

PTS: 2 REF: 062425ai NAT: A.REI.B.3 TOP: Solving Linear Inequalities

9 ANS: 2 PTS: 2 REF: 062415ai NAT: F.BF.A.1

TOP: Sequences KEY: explicit

10 ANS: 1

$$m = \frac{8 - (-2)}{-1 - 4} = \frac{10}{-5} = -2 \quad y = mx + b$$

$$8 = -2(-1) + b$$

$$6 = b$$

PTS: 2 REF: 012502ai NAT: A.REI.D.10 TOP: Writing Linear Equations

KEY: slope-intercept form

11 ANS:

	Play Video Games	Do Not Play Video Games	Total
Social Media	85	40	125
No Social Media	15	10	25
Total	100	50	150

PTS: 2 REF: 062428ai NAT: S.ID.B.5 TOP: Frequency Tables

KEY: two-way

12 ANS: 4 PTS: 2 REF: 012507ai NAT: A.REI.D.12

TOP: Graphing Systems of Linear Inequalities

13 ANS:

$$x = \frac{-4 \pm \sqrt{4^2 - 4(1)(-3)}}{2(1)} = \frac{-4 \pm \sqrt{28}}{2} = \frac{-4 \pm 2\sqrt{7}}{2} = -2 \pm \sqrt{7}$$

PTS: 4 REF: 012533ai NAT: A.REI.B.4 TOP: Solving Quadratics

KEY: quadratic formula

14 ANS:

$$5x^3 - 80x = 5x(x^2 - 16) = 5x(x + 4)(x - 4)$$

PTS: 2 REF: 082430ai NAT: A.SSE.A.2

TOP: Factoring the Difference of Perfect Squares

15 ANS: 4

$$2\sqrt{54} + 2\sqrt{6} = 2\sqrt{9}\sqrt{6} + 2\sqrt{6} = 6\sqrt{6} + 2\sqrt{6} = 8\sqrt{6}$$

PTS: 2 REF: 082415ai NAT: N.RN.B.3 TOP: Operations with Radicals

KEY: addition

16 ANS: 1

$$-2(3x - 5) = \frac{9}{2}x - 2$$

$$-4(3x - 5) = 9x - 4$$

$$-12x + 20 = 9x - 4$$

$$24 = 21x$$

$$x = \frac{24}{21} = \frac{8}{7}$$

PTS: 2 REF: 012511ai NAT: A.REI.B.3 TOP: Solving Linear Equations

17 ANS:

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(1)(-6)}}{2(1)} = \frac{-3 \pm \sqrt{33}}{2}$$

PTS: 4 REF: 082429ai NAT: A.REI.B.4 TOP: Solving Quadratics

KEY: quadratic formula

18 ANS:

$$y = 15.13x - 959.63, 0.99, \text{strong}$$

PTS: 4 REF: 082431ai NAT: S.ID.B.6 TOP: Regression

KEY: linear with correlation coefficient

19 ANS: 4

$$6.4 - 4x \geq -2.8$$

$$9.2 \geq 4x$$

$$2.3 \geq x$$

PTS: 2 REF: 012522ai NAT: A.REI.B.3 TOP: Solving Linear Inequalities

20 ANS: 2

$$x + x + 8 \geq 20$$

PTS: 2 REF: 012523ai NAT: A.CED.A.1 TOP: Modeling Linear Inequalities

21 ANS:

x may be any value other than $-2, -1, 0$, so that for any value of x , there is a unique y .

PTS: 2 REF: 062427ai NAT: F.IF.A.1 TOP: Defining Functions

22 ANS: 3

PTS: 2

REF: 062423ai

NAT: N.Q.A.1

TOP: Conversions

23 ANS: 4

$$m = \frac{7 - 3}{2 - -1} = \frac{4}{3}$$

PTS: 2 REF: fall2302ai NAT: A.REI.D.10 TOP: Writing Linear Equations

KEY: other forms

24 ANS:

$$g(-3) = (-3)^3 + 2(-3)^2 - (-3) = -27 + 18 + 3 = -6$$

PTS: 2 REF: 062426ai NAT: F.IF.A.2 TOP: Functional Notation

25 ANS: 4 PTS: 2 REF: 012521ai NAT: F.BF.B.3

TOP: Transformations with Functions KEY: bimodalgraph

26 ANS:

$$0.05(x - 3) = 0.35x - 7.5$$

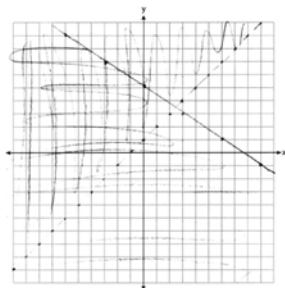
$$x - 3 = 7x - 150$$

$$147 = 6x$$

$$24.5 = x$$

PTS: 2 REF: 082428ai NAT: A.REI.B.3 TOP: Solving Linear Equations

27 ANS:



$(-1, 1)$ is a solution as it is in the overlap area.

PTS: 4 REF: 062434ai NAT: A.REI.D.12 TOP: Graphing Systems of Linear Inequalities

28 ANS: 1 PTS: 2 REF: 082412ai NAT: F.LE.B.5

TOP: Modeling Linear Functions

29 ANS:

x	-1	0	1	2	2
y	2	4	4	5	4

For every value of x , there is a unique value of y .

PTS: 2 REF: 082427ai NAT: F.IF.A.1 TOP: Defining Functions

30 ANS: 2

$$\text{mean: } \frac{3(0) + 3(1) + 4(2) + 5(3) + 2(4) + 2(5) + 1(6)}{3 + 3 + 4 + 5 + 2 + 2 + 1} = \frac{50}{20} = 2.5, \text{ mode: } 3, \text{ median: } \frac{2+3}{2} = 2.5$$

PTS: 2 REF: 062416ai NAT: S.ID.A.1 TOP: Dot Plots

31 ANS: 3

$$\frac{5 - -1}{-1 - 2} = \frac{6}{-3} = -2 \quad 5 = -2(-1) + b$$

$$3 = b$$

PTS: 2 REF: 062410ai NAT: F.IF.B.4 TOP: Graphing Linear Functions

32 ANS:

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(3)(5)}}{2(3)} = \frac{10 \pm \sqrt{40}}{6} = \frac{10 \pm 2\sqrt{10}}{6} = \frac{5 \pm \sqrt{10}}{3}$$

PTS: 4 REF: 062433ai NAT: A.REI.B.4 TOP: Solving Quadratics

KEY: quadratic formula

33 ANS:

$$n + d = 25 \quad n + 9 = 25$$

$$5n + 10d = 170 \quad n = 16$$

$$5(25 - d) + 10d = 170$$

$$125 - 5d + 10d = 170$$

$$5d = 45$$

$$d = 9$$

PTS: 4 REF: 012531ai NAT: A.CED.A.3 TOP: Modeling Linear Systems

34 ANS:

$$-22 = \frac{-3x - 5}{2}$$

$$-44 = -3x - 5$$

$$-39 = -3x$$

$$13 = x$$

PTS: 2 REF: 012529ai NAT: F.IF.A.2 TOP: Functional Notation

35 ANS: 3

$$\frac{425 - 50}{350 - 100} = 1.5$$

PTS: 2 REF: 082410ai NAT: F.IF.B.6 TOP: Rate of Change

36 ANS: 2

$$4 - 1 = 2 \left(\frac{5}{4} + \frac{1}{4} \right)$$

$$3 = 3$$

PTS: 2 REF: 012518ai NAT: A.REI.D.10 TOP: Identifying Solutions

37 ANS: 2

$$25r^2 = 625$$

$$r^2 = 25$$

$$r = \pm 5$$

PTS: 2 REF: 062412ai NAT: F.IF.A.3 TOP: Sequences

KEY: difference or ratio

- 38 ANS: 2 PTS: 2 REF: 012506ai NAT: A.APR.A.1
TOP: Operations with Polynomials KEY: subtraction
- 39 ANS: 4 PTS: 2 REF: 082407ai NAT: N.RN.B.3
TOP: Operations with Radicals KEY: classify
- 40 ANS: 1 PTS: 2 REF: 082402ai NAT: F.LE.A.1
TOP: Families of Functions
- 41 ANS: 2
$$\frac{4(x-5)}{3} = 12$$
$$4x - 20 = 36$$
$$4x = 56$$
$$x = 14$$
- PTS: 2 REF: 062406ai NAT: A.REI.B.3 TOP: Solving Linear Equations
- 42 ANS: 3 PTS: 2 REF: 012513ai NAT: F.LE.A.1
TOP: Families of Functions
- 43 ANS: 1 PTS: 2 REF: 062405ai NAT: N.RN.B.3
TOP: Operations with Radicals KEY: classify
- 44 ANS: 4
$$3(x^2 - 2x + 3) - (4x^2 + 3x - 1)$$
$$3x^2 - 6x + 9 - 4x^2 - 3x + 1$$
$$-x^2 - 9x + 10$$
- PTS: 2 REF: 082403ai NAT: A.APR.A.1 TOP: Operations with Polynomials
KEY: subtraction
- 45 ANS: 3
$$x^2 - 5x - 14 = x + 2$$
$$x^2 - 6x - 16 = 0$$
$$(x - 8)(x + 2) = 0$$
$$x = 8, -2$$
- PTS: 2 REF: 082416ai NAT: A.REI.D.11 TOP: Quadratic-Linear Systems
- 46 ANS:
$$x^2 + 6x + 9 = 41 + 9$$
$$(x + 3)^2 = 50$$
$$x + 3 = \pm\sqrt{50}$$
$$x = -3 \pm 5\sqrt{2}$$
- PTS: 4 REF: fall2304ai NAT: A.REI.B.4 TOP: Solving Quadratics
KEY: completing the square

47 ANS: 2
 $110 - 60 = 50$

PTS: 2 REF: 062413ai NAT: S.ID.A.1 TOP: Box Plots
 KEY: interpret

48 ANS:
 $20x^3 - 45x = 5x(4x^2 - 9) = 5x(2x + 3)(2x - 3)$

PTS: 2 REF: 062430ai NAT: A.SSE.A.2
 TOP: Factoring the Difference of Perfect Squares

49 ANS: 1

$$\frac{200}{300 + 200 + 80 + 25 + 120 + 105 + 100 + 70} = \frac{200}{1000} = 20\%$$

PTS: 2 REF: 012510ai NAT: S.ID.B.5 TOP: Frequency Tables
 KEY: two-way

50 ANS: 1 PTS: 2 REF: 062420ai NAT: A.REI.D.11
 TOP: Quadratic-Linear Systems

51 ANS: 4 PTS: 2 REF: 082419ai NAT: F.IF.A.3
 TOP: Sequences KEY: difference or ratio

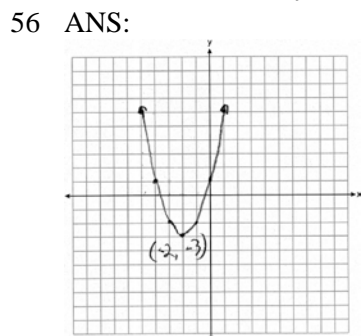
52 ANS: 4
 $\frac{8}{2} = 4$

PTS: 2 REF: 012503ai NAT: F.IF.A.3 TOP: Sequences
 KEY: difference or ratio

53 ANS: 4 PTS: 2 REF: 082406ai NAT: A.REI.A.1
 TOP: Identifying Properties

54 ANS: 2
 $5^{a+2b} = 5^a \cdot 5^{2b} = 5^a \cdot 25^b$

PTS: 2 REF: 082422ai NAT: A.APR.A.1 TOP: Multiplication of Powers
 55 ANS: 3 PTS: 2 REF: 082421ai NAT: A.APR.B.3
 TOP: Zeros of Polynomials



PTS: 2 REF: 082425ai NAT: F.IF.C.7 TOP: Graphing Quadratic Functions
 57 ANS: 4 PTS: 2 REF: 012519ai NAT: N.Q.A.1
 TOP: Conversions

58 ANS: 3

69,70,70,71,72,74,76,78 ordered. median: $\frac{71+72}{2} = 71.5$

PTS: 2

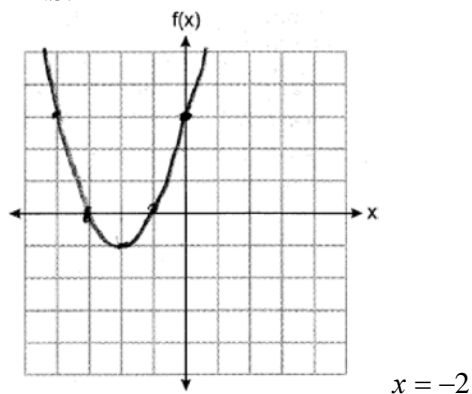
REF: 082409ai

NAT: S.ID.A.1

TOP: Box Plots

KEY: represent

59 ANS:



PTS: 2

REF: 012526ai

NAT: F.IF.C.7

TOP: Graphing Quadratic Functions

60 ANS: 1

PTS: 2

REF: 082418ai

NAT: A.REI.D.10

TOP: Writing Linear Equations

KEY: other forms

61 ANS:

 $2m + 3r = 38.5$ Jen is not correct because the prices are $6m + 9r = 115.5$ $2m + 3(8.5) = 38.5$ $6m + r = 47.5$ $6m + r = 47.5$ $2m + 25.5 = 38.5$ $8r = 68$ $2m = 13$ $r = 8.50$ $m = 6.50$

PTS: 6

REF: 082435ai

NAT: A.CED.A.3

TOP: Modeling Linear Systems

62 ANS:

 $x^2 + 4x - 1 = 2x + 7$ $y = 2(-4) + 7 = -1$ $(-4, -1), (2, 11)$ $x^2 + 2x - 8 = 0$ $y = 2(2) + 7 = 11$ $(x + 4)(x - 2) = 0$ $x = -4, 2$

PTS: 4

REF: 082434ai

NAT: A.REI.C.7

TOP: Quadratic-Linear Systems

63 ANS:

 $x^2 + 5x - 17 = x - 5$ $-6 - y = 5$ $2 - y = 5$ $(-6, -11), (2, -3)$ $x^2 + 4x - 12 = 0$ $y = -11$ $y = -3$ $(x + 6)(x - 2) = 0$ $x = -6, 2$

PTS: 4

REF: fall2305ai

NAT: A.REI.C.7

TOP: Quadratic-Linear Systems

64 ANS:

$$\frac{3}{2\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{3\sqrt{6}}{12}$$

PTS: 2 REF: fall2303ai NAT: N.RN.B.3 TOP: Operations with Radicals

KEY: division

65 ANS: 1 PTS: 2 REF: 012504ai NAT: A.SSE.A.1

TOP: Modeling Expressions

66 ANS: 2

All four functions have a real domain. f has a real range. h has a positive real range. m has a nonnegative real range.

PTS: 2 REF: 062424ai NAT: F.IF.A.2 TOP: Domain and Range

67 ANS: 1 PTS: 2 REF: fall2301ai NAT: N.RN.B.3

TOP: Operations with Radicals

KEY: addition

68 ANS: 3 PTS: 2 REF: 012512ai NAT: A.APR.A.1

TOP: Multiplication of Powers

69 ANS: 4 PTS: 2 REF: 082401ai NAT: A.SSE.A.2

TOP: Factoring Polynomials

70 ANS: 2

$$p = 2l + 2w$$

$$p - 2l = 2w$$

$$\frac{p - 2l}{2} = w$$

PTS: 2 REF: 012509ai NAT: A.CED.A.4 TOP: Transforming Formulas

71 ANS: 1 PTS: 2 REF: 062421ai NAT: F.LE.B.5

TOP: Modeling Linear Functions

72 ANS: 3

$$x^3 - 36x = x(x^2 - 36) = x(x + 6)(x - 6)$$

PTS: 2 REF: 012501ai NAT: A.SSE.A.2

TOP: Factoring the Difference of Perfect Squares

73 ANS:

5-6 minutes, as the speed remains at 35 mph during this interval.

PTS: 2 REF: 012525ai NAT: F.IF.B.4 TOP: Relating Graphs to Events

74 ANS: 4 PTS: 2 REF: 012514ai NAT: A.REI.A.1

TOP: Identifying Properties

75 ANS: 4 PTS: 2 REF: 012515ai NAT: N.RN.B.3

TOP: Operations with Radicals

KEY: addition

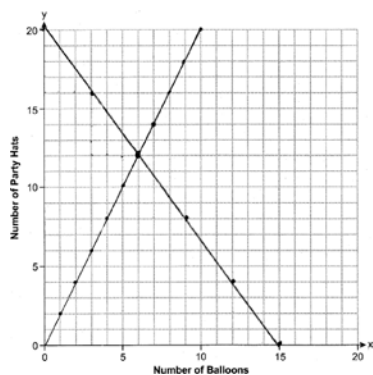
76 ANS:

$$y = 9.1x - 527.6, 0.9, \text{ strong relationship}$$

PTS: 4 REF: 012532ai NAT: S.ID.B.6 TOP: Regression

KEY: linear with correlation coefficient

77 ANS:



$$2x + 1.5y = 30$$

$$y = 2x$$

hats.

(6,12) is the intersection, meaning Anna bought 6 balloons and 12

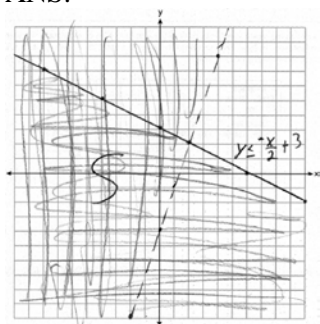
PTS: 6

REF: 012535ai

NAT: A.REI.C.6

TOP: Graphing Linear Systems

78 ANS:

; No, because $2 > 3(2) - 4$ is false.

PTS: 4

REF: 082432ai

NAT: A.REI.D.12

TOP: Graphing Systems of Linear Inequalities

79 ANS:

$$x^2 + 8x + 16 = 33 + 16$$

$$(x + 4)^2 = 49$$

$$x + 4 = \pm 7$$

$$x = -11, 3$$

PTS: 2

REF: 012528ai

NAT: A.REI.B.4

TOP: Solving Quadratics

KEY: completing the square

80 ANS: 3

$$\frac{68}{68 + 79} \approx 0.46$$

PTS: 2

REF: 082414ai

NAT: S.ID.B.5

TOP: Frequency Tables

KEY: two-way

81 ANS: 3

PTS: 2

REF: 082411ai

NAT: F.BF.B.3

TOP: Transformations with Functions

82 ANS: 2

$$3x - ax = 12$$

$$x(3 - a) = 12$$

$$x = \frac{12}{3 - a}$$

PTS: 2 REF: 062422ai NAT: A.REI.B.3 TOP: Solving Linear Equations

KEY: coefficients represented by letters

83 ANS: 3

$$\frac{-2 - 4}{3 - 1} = \frac{-6}{2} = -3$$

PTS: 2 REF: 082423ai NAT: F.IF.A.3 TOP: Sequences

KEY: difference or ratio

84 ANS:

$$f\left(\frac{1}{2}\right) = \frac{30\left(\frac{1}{2}\right)^2}{\frac{1}{2} + 2} = \frac{\frac{30}{4}}{\frac{5}{2}} = \frac{15}{2} \times \frac{2}{5} = 3$$

PTS: 2 REF: 082426ai NAT: F.IF.A.2 TOP: Functional Notation

85 ANS: 3 PTS: 2 REF: 062408ai NAT: A.SSE.A.1

TOP: Modeling Expressions

86 ANS: 1

$$\frac{15 - 25}{3 - 1} = \frac{-10}{2} = -5 \quad a_{10} = 25 + (10 - 1)(-5) = 25 - 45 = -20$$

PTS: 2 REF: 012508ai NAT: F.BF.A.1 TOP: Sequences

KEY: explicit

87 ANS: 4

$$2m - 4 \leq 3(2m + 4)$$

$$2m - 4 \leq 6m + 12$$

$$-16 \leq 4m$$

$$-4 \leq m$$

PTS: 2 REF: 082413ai NAT: A.REI.B.3 TOP: Solving Linear Inequalities

88 ANS: 3

77 78 81 84 86 88 93 95

79.5 90.5

$$90.5 - 79.5 = 11$$

PTS: 2 REF: 012520ai NAT: S.ID.A.2 TOP: Dispersion

KEY: basic

89 ANS: 2

$$x^2 + 6x = 18$$

$$x^2 + 6x + 9 = 18 + 9$$

$$(x + 3)^2 = 27$$

PTS: 2 REF: 082408ai NAT: A.REI.B.4 TOP: Solving Quadratics

KEY: completing the square

90 ANS: 3 PTS: 2 REF: 062407ai NAT: F.LE.A.1

TOP: Families of Functions

91 ANS:

$$\frac{4}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$$

PTS: 2 REF: 012530ai NAT: N.RN.B.3 TOP: Operations with Radicals

KEY: division

92 ANS: 1 PTS: 2 REF: 082405ai NAT: A.SSE.A.1

TOP: Modeling Expressions

93 ANS: 2 PTS: 2 REF: 082404ai NAT: A.CED.A.1

TOP: Modeling Linear Equations

94 ANS: 1 PTS: 2 REF: 012516ai NAT: S.ID.A.1

TOP: Dot Plots

95 ANS: 2 PTS: 2 REF: 062402ai NAT: A.CED.A.3

TOP: Modeling Systems of Linear Inequalities

96 ANS: 1 PTS: 2 REF: 062403ai NAT: A.APR.A.1

TOP: Multiplication of Powers

97 ANS: 4

$$(4a^2 - a + 3)(a - 5) = 4a^3 - 20a^2 - a^2 + 5a + 3a - 15 = 4a^3 - 21a^2 + 8a - 15$$

PTS: 2 REF: 082417ai NAT: A.APR.A.1 TOP: Operations with Polynomials

KEY: multiplication

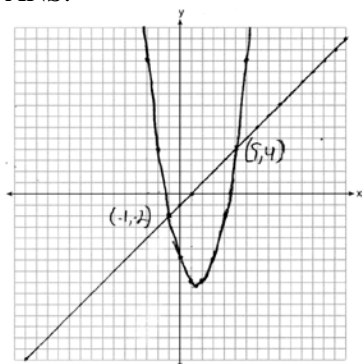
98 ANS:

$$y = -37.57x + 215.67, -0.98, \text{ strong}$$

PTS: 4 REF: 062432ai NAT: S.ID.B.6 TOP: Regression

KEY: linear with correlation coefficient

99 ANS:



PTS: 4 REF: 062431ai NAT: A.REI.C.7 TOP: Quadratic-Linear Systems
 100 ANS: 2 PTS: 2 REF: 062409ai NAT: A.APR.B.3
 TOP: Zeros of Polynomials

101 ANS: 4 PTS: 2 REF: 082424ai NAT: N.Q.A.1
 TOP: Conversions

102 ANS:
 7, as for each value of x , there is a unique value of y .

PTS: 2 REF: 012527ai NAT: F.IF.A.1 TOP: Defining Functions
 103 ANS:

$$x^2 - 7x + 12 = 2x - 6 \quad y = 2(6) - 6 = 6 \quad (6, 6), (3, 0)$$

$$x^2 - 9x + 18 = 0 \quad y = 2(3) - 6 = 0$$

$$(x - 6)(x - 3) = 0$$

$$x = 6, 3$$

PTS: 4 REF: 012534ai NAT: A.REI.C.7 TOP: Quadratic-Linear Systems
 104 ANS: 1
 $\frac{55 - 0}{5.5 - 0} = 10$

PTS: 2 REF: 062418ai NAT: F.IF.B.6 TOP: Rate of Change
 105 ANS: 2

$$6 - ax = ax - 2$$

$$8 = 2ax$$

$$\frac{8}{2a} = x$$

$$\frac{4}{a} = x$$

PTS: 2 REF: 082420ai NAT: A.REI.B.3 TOP: Solving Linear Equations
 KEY: coefficients represented by letters
 106 ANS: 4 PTS: 2 REF: 062417ai NAT: F.BF.B.3
 TOP: Transformations with Functions

107 ANS:

$$t = \frac{-64}{2(-16)} = 2 \quad h(2) = -16(2)^2 + 64(2) + 80 = -64 + 128 + 80 = 144 \quad (2, 144). \text{ At 2 seconds, the object is 144 feet}$$

above the ground. $0 = -16t^2 + 64t + 80$

$$0 = t^2 - 4t - 5$$

$$0 = (t - 5)(t + 1)$$

$$t = 5$$

PTS: 4 REF: 082433ai NAT: F.IF.B.4 TOP: Graphing Quadratic Functions

KEY: key features

108 ANS: 2 PTS: 2 REF: 012505ai NAT: F.LE.B.5

TOP: Modeling Linear Functions

109 ANS: 4

$$2x^2 + 7x - 10x - 35 - x - 5 = 2x^2 - 4x - 40$$

PTS: 2 REF: 062419ai NAT: A.APR.A.1 TOP: Operations with Polynomials

KEY: multiplication

110 ANS: 4 PTS: 2 REF: 012524ai NAT: F.IF.C.7

TOP: Graphing Piecewise-Defined Functions