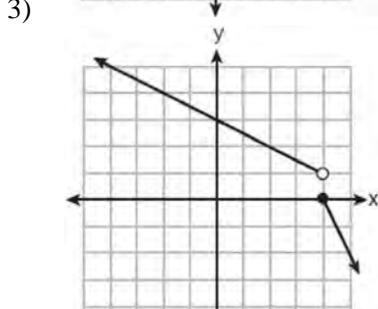# JMAP
REGENTS BY TYPE

The NY Algebra I Regents Exams Questions
from Fall 2023 to January 2025 Sorted by Type

Algebra I Multiple Choice Regents Exam Questions

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

1)

2)

3)

4)

2 Which equation is always true?
1) $x^2 \bullet x^3 = x^5$
2) $3^x \bullet 3^2 = 9^{2x}$
3) $-z^2 = z^2$
4) $7^a \bullet 7^b = 7^{ab}$

3 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

4 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) $k(x) = (x - 1)(x + 3)(x + 4)$
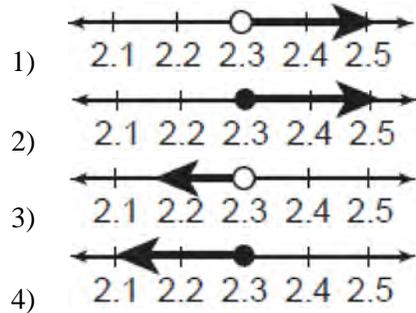
5 What is the sum of $3x\sqrt{7}$ and $2x\sqrt{7}$?
1) $5x\sqrt{7}$
2) $5x^2\sqrt{7}$
3) $5x\sqrt{14}$
4) $5x^2\sqrt{14}$

6 If $f(x) = x^2$, then which function represents a shift of the graph of $f(x)$ 4 units to the right and 3 units down?
1) $g(x) = (x + 4)^2 + 3$
2) $j(x) = (x + 4)^2 - 3$
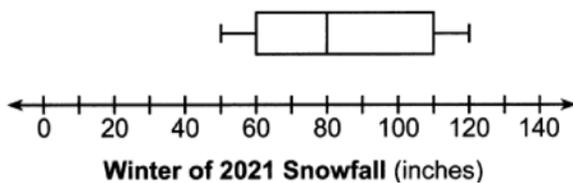3) $h(x) = (x - 4)^2 - 3$
4) $k(x) = (x - 4)^2 + 3$

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

1) [number line with open circle at 2.3, shaded right]
   2.1 2.2 2.3 2.4 2.5

2) [number line with closed circle at 2.3, shaded right]
   2.1 2.2 2.3 2.4 2.5

3) [number line with open circle at 2.3, shaded left]
   2.1 2.2 2.3 2.4 2.5

4) [number line with closed circle at 2.3, shaded left]
   2.1 2.2 2.3 2.4 2.5

8 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) $\dfrac{400 \text{ m}}{43.03 \text{ sec}} \cdot \dfrac{1000 \text{ m}}{0.62 \text{ mi}} \cdot \dfrac{1 \text{ hr}}{3600 \text{ sec}}$

2) $\dfrac{400 \text{ m}}{43.03 \text{ sec}} \cdot \dfrac{0.62 \text{ mi}}{1000 \text{ m}} \cdot \dfrac{1 \text{ hr}}{3600 \text{ sec}}$

3) $\dfrac{400 \text{ m}}{43.03 \text{ sec}} \cdot \dfrac{0.62 \text{ mi}}{1000 \text{ m}} \cdot \dfrac{3600 \text{ sec}}{1 \text{ hr}}$

4) $\dfrac{400 \text{ m}}{43.03 \text{ sec}} \cdot \dfrac{1000 \text{ m}}{0.62 \text{ mi}} \cdot \dfrac{3600 \text{ sec}}{1 \text{ hr}}$

9 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.

[box plot]

0   20   40   60   80   100   120   140
Winter of 2021 Snowfall (inches)

What is the interquartile range?
1) 30
2) 50
3) 80
4) 110

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

[graph of system of inequalities]

Which point is a solution to this system?
1) $(1,1)$
2) $(2,-2)$
3) $(1,8)$
4) $(4,2)$

11 A function is graphed on the set of axes below.

[graph of f(x)]

The domain of this function is
1) $\{x \mid x > -2\}$
2) $\{x \mid x \geq -2\}$
3) $\{x \mid x > -4\}$
4) $\{x \mid x \geq -4\}$

2

12 Market Street Pizza kept a record of pizza sales for the month of February. The results are shown in the table below.

Type	Plain	Veggie	Meat Only	The Works
Thin Crust	300	80	120	100
Deep-dish	200	25	105	70

Of all the pizzas sold in February, what percent were plain, deep-dish pizzas?
1)   20%
2)   30%
3)   40%
4)   50%

13 A survey of students at West High School was taken to determine a theme for the prom. The results of the survey are summarized in the table below.

	Beach Party	Hollywood	Broadway
Girls	86	112	68
Boys	123	77	79

Approximately what percentage of the students who chose the Broadway theme were girls?
1)   26
2)   27
3)   46
4)   68

14 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) $x^2 + 7x - 7$

15 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) $-x^2 - 9x + 10$

16 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

17 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) $\dfrac{4}{a}$
3) $2a$
4) $\dfrac{2}{a}$

3

18 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

19 The solution to $\dfrac{4(x-5)}{3} + 2 = 14$ is
1) 15
2) 14
3) 6
4) 4

20 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

21 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) $4x^3 - 5x^2 + 3$

22 A geometric sequence with a common ratio of -3 is
1) $-10, -7, -4, -1, \ldots$
2) $14, 11, 8, 5, \ldots$
3) $-2, -6, -18, -54, \ldots$
4) $4, -12, 36, -108, \ldots$

23 What is the degree of the polynomial $2x - x^2 + 4x^3$?
1) 1
2) 2
3) 3
4) 4

24 In an arithmetic sequence, the first term is 25 and the third term is 15. What is the tenth term in this sequence?
1) -20
2) -25
3) 70
4) 75

25 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) $2x^2 - 4x - 40$

26 Which ordered pair is a solution to the equation $y - 1 = 2\left(x + \dfrac{1}{4}\right)$?
1) $(0.75, 0)$
2) $(1.25, 4)$
3) $(2.5, -6.5)$
4) $(4, -9.5)$

27 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.

28 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

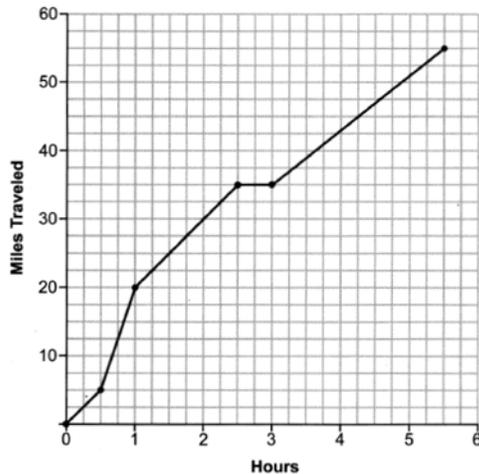The interquartile range of these data is
1) 7
2) 10
3) 11
4) 18

29 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) $\dfrac{1}{5}$
2) 5
3) $\dfrac{1}{25}$
4) 25

30 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.

5

31 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

32 What is the solution to the inequality $2m - 4 \le 3(2m + 4)$?
1) $m \le -2$
2) $m \ge -2$
3) $m \le -4$
4) $m \ge -4$

33 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) $x(x + 18)(x - 18)$

34 What is an equation of the line that passes through the points $(2, 7)$ and $(-1, 3)$?
1) $y - 2 = \dfrac{3}{4}(x - 7)$
2) $y - 2 = \dfrac{4}{3}(x - 7)$
3) $y - 7 = \dfrac{3}{4}(x - 2)$
4) $y - 7 = \dfrac{4}{3}(x - 2)$

35 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
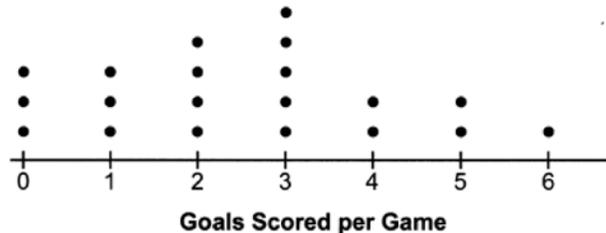
36 When the formula $p = 2l + 2w$ is solved for w, the result is
1) $w = \dfrac{2l + p}{2}$
2) $w = \dfrac{p - 2l}{2}$
3) $w = \dfrac{p}{2} + l$
4) $w = l - \dfrac{p}{2}$

37 The sum of $2\sqrt{54}$ and $2\sqrt{6}$ is
1) $4\sqrt{60}$
2) $8\sqrt{15}$
3) $7\sqrt{6}$
4) $8\sqrt{6}$

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

Goals Scored per Game

Which statement about the dot plot is correct?
1) mean > mode
2) mean = median
3) mode = median
4) median > mean

39 When solving the equation $4x^2 - 16 = 0$, Laura wrote $4x^2 = 16$ as her first step. Which property justifies Laura's first step?
1) distributive property of multiplication over addition
2) multiplication property of equality
3) commutative property of addition
4) addition property of equality

40 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) $(x-2)(x+6)$

41 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

42 A geometric sequence is shown below.
$$\frac{1}{2}, 2, 8, 32, \ldots$$
What is the common ratio?
1) $\frac{1}{4}$
2) 2
3) $\frac{1}{2}$
4) 4

43 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) $d(t)$

7

44 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

45 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) $4a^3 - 21a^2 + 8a - 15$

46 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) $\frac{1}{3} + \sqrt{3}$

47 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) $.05(x + 12) + .10(2x) + .25x = 28$

48 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) $y = -0.5x + 8.5$

49 What is the constant term of the polynomial $2x^3 - x + 5 + 4x^2$?
1) 5
2) 2
3) 3
4) 4

50 What is the sum of $8\sqrt{3}$ and $\sqrt{3}$?
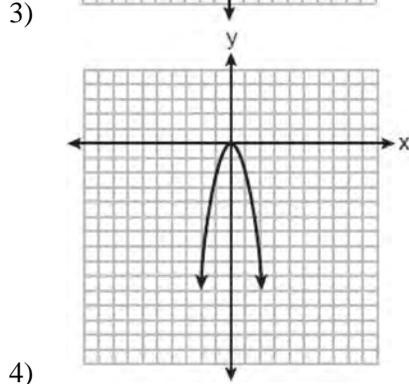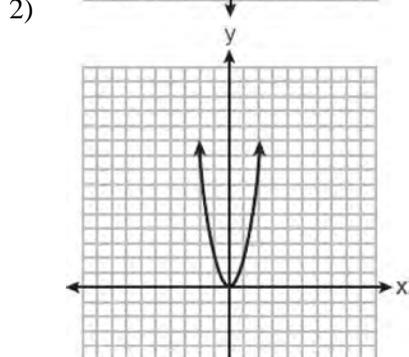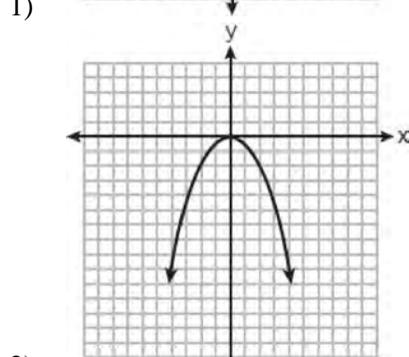1) $8\sqrt{6}$
2) $9\sqrt{6}$
3) $7\sqrt{3}$
4) $9\sqrt{3}$

51 Four quadratic functions are represented below.

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

I

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

III

b(x)

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

52 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?

1)

2)

3)

4)

53 When solved for x in terms of a, the solution to the equation $3x - 7 = ax + 5$ is

1) $\dfrac{12}{3a}$

2) $\dfrac{12}{3 - a}$

3) $\dfrac{3a}{12}$

4) $\dfrac{3 - a}{12}$

54 The equation that represents the sequence $-2, -5, -8, -11, -14, \ldots$ is
1) $a_n = -3 + (-2)(n - 1)$
2) $a_n = -2 + (-3)(n - 1)$
3) $a_n = 3 + (-2)(n - 1)$
4) $a_n = -2 + (3)(n - 1)$

9

55 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) $\dfrac{7\,\text{sec}}{50\,\text{meters}} \cdot \dfrac{60\,\text{sec}}{1\,\text{min}} \cdot \dfrac{1\,\text{meter}}{39.37\,\text{in}}$

2) $\dfrac{7\,\text{sec}}{50\,\text{meters}} \cdot \dfrac{1\,\text{min}}{60\,\text{sec}} \cdot \dfrac{39.37\,\text{in}}{1\,\text{meter}}$

3) $\dfrac{50\,\text{meters}}{7\,\text{sec}} \cdot \dfrac{60\,\text{sec}}{1\,\text{min}} \cdot \dfrac{1\,\text{meter}}{39.37\,\text{in}}$

4) $\dfrac{50\,\text{meters}}{7\,\text{sec}} \cdot \dfrac{60\,\text{sec}}{1\,\text{min}} \cdot \dfrac{39.37\,\text{in}}{1\,\text{meter}}$

56 In an arithmetic sequence, the first term is 4 and the third term is −2. What is the common difference?
1) −1
2) −2
3) −3
4) −6

57 The expression 5^{a+2b} is equivalent to
1) $5^a \cdot 5^2 \cdot 5^b$
2) $5^a \cdot 25^b$
3) 25^{2ab}
4) 25^{a+2b}

58 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.

59 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) $a + c \le 48$

   $18a + 12c \ge 650$
3) $a + c < 48$

   $18a + 12c < 650$
4) $a + c \le 48$

   $18a + 12c \le 650$

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 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) $m(x) = |x + 3|$

62 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) $2x^4 - 5x^2 + 5$

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

1)

2)

3)

4)

64 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) $\dfrac{3240 \text{ ft}^3}{1 \text{ pool}} \bullet \dfrac{1 \text{ ft}^3}{7.5 \text{ gal}} \bullet \dfrac{6000 \text{ gal}}{1 \text{ truck load}}$

2) $\dfrac{3240 \text{ ft}^3}{1 \text{ pool}} \bullet \dfrac{1 \text{ ft}^3}{7.5 \text{ gal}} \bullet \dfrac{1 \text{ truck load}}{6000 \text{ gal}}$

3) $\dfrac{3240 \text{ ft}^3}{1 \text{ pool}} \bullet \dfrac{7.5 \text{ gal}}{1 \text{ ft}^3} \bullet \dfrac{6000 \text{ gal}}{1 \text{ truck load}}$

4) $\dfrac{3240 \text{ ft}^3}{1 \text{ pool}} \bullet \dfrac{7.5 \text{ gal}}{1 \text{ ft}^3} \bullet \dfrac{1 \text{ truck load}}{6000 \text{ gal}}$

65 Which equation has the same solutions as $x^2 + 6x - 18 = 0$?

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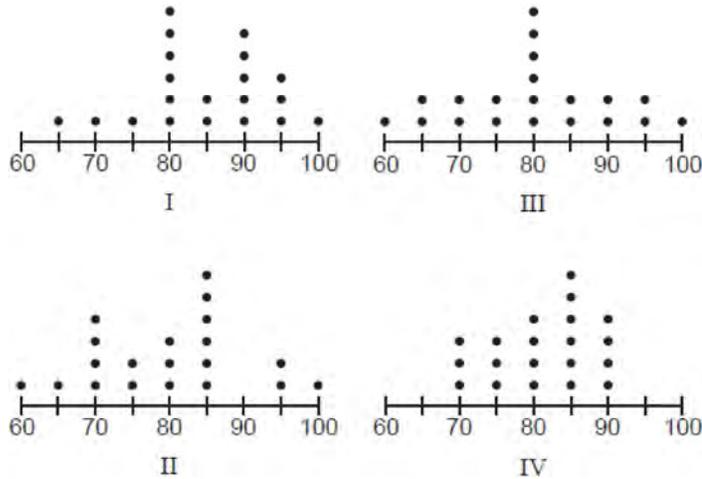2) $(x + 3)^2 = 27$
3) $(x + 6)^2 = 24$
4) $(x + 6)^2 = 27$

66 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) $x^{a+b} \bullet x^{a+b}$

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

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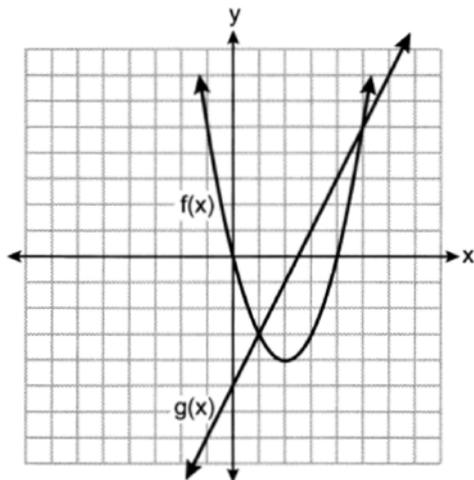3) −5 and 2, only
4) 5 and −2, only

68 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

69 The functions $f(x)$ and $g(x)$ are graphed on the set of axes below.

What is the solution to the equation $f(x) = g(x)$?
1) 1 and 5
2) −5 and 0
3) −3 and 5
4) 0 and 4

70 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) $-\frac{16}{3}$

71 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

12

72 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

73 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) $2x + 8 \leq 20$

74 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) $\sqrt{49} + 3\sqrt{121}$

Algebra I 2 Point Regents Exam Questions

75 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	

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

f(x)

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

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

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

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

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

80 Use the method of completing the square to determine the exact values of x for the equation $x^2 + 10x - 30 = 0$.

14

81 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.

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

State the coordinates of the minimum.

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

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

85 Rationalize: $\dfrac{3}{2\sqrt{6}}$

86 If $f(x) = \dfrac{-3x - 5}{2}$, algebraically determine the value of x when $f(x) = -22$.

87 Solve $5(x - 2) \le 3x + 20$ algebraically.

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

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

90 If $f(x) = \dfrac{30x^2}{x + 2}$, determine the value of $f\left(\dfrac{1}{2}\right)$.

91 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			

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

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

93 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.

Algebra I 4 Point Regents Exam Questions

94 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.

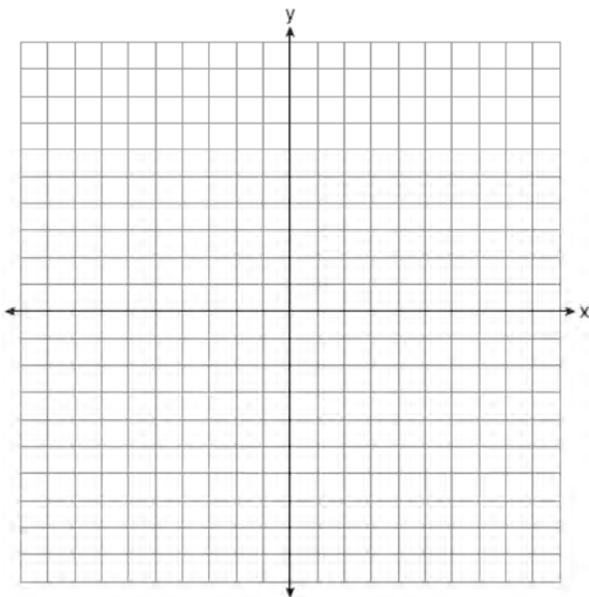| Average Daily Temp. (x)	72	75	81	78	77	76	80
Daily Ice Cream Cone Sales (y)	126	183	263	229	200	185	249

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.

95 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.

96 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.

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

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

$$x - y = 5$$

98 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.

99 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.
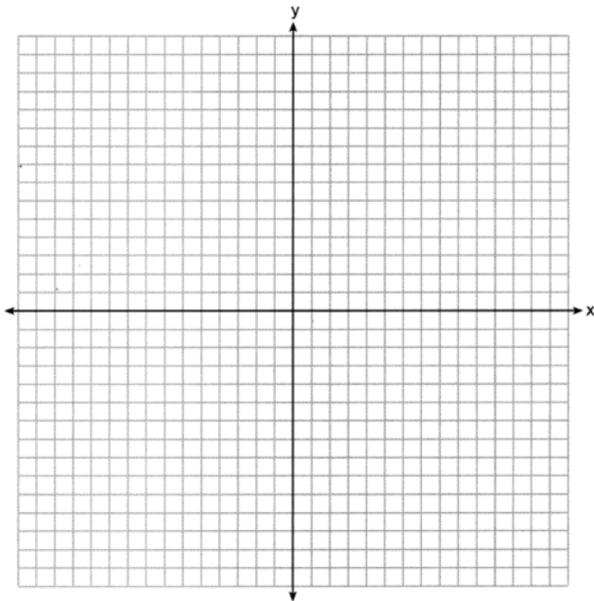
Average Heart Rate (x)	135	147	150	144	146	153	143
Calories Burned (y)	725	812	866	761	825	863	737

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.

100 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.

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

102 Use the quadratic formula to solve the equation $3x^2 - 10x + 5 = 0$. Express the answer in simplest radical form.

103 Solve the following system of equations algebraically for all values of x and y:
$$y = x^2 - 7x + 12$$
$$y = 2x - 6$$

104 Solve the systems of equations algebraically for all values of x and y:
$$y = x^2 + 4x - 1$$
$$y = 2x + 7$$

105 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.

106 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.

107 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.

Algebra 1 6 Point Regents Exam Questions

108 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 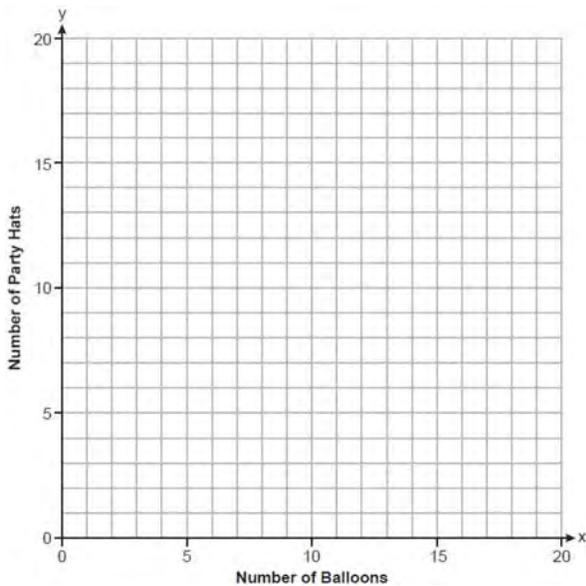needs is twice as many as the number of balloons. If x represents the number of balloons and y represents the number of party hats, write a system of equations that can be used to represent this situation. Graph your system of equations on the set of axes below.

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

109 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.

110 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.

Algebra I Multiple Choice Regents Exam Questions
Answer Section

1 ANS: 4   REF: 012524ai   NAT: F.IF.C.7   TOP: Graphing Piecewise-Defined Functions
2 ANS: 1   REF: 062403ai   NAT: A.APR.A.1   TOP: Multiplication of Powers
3 ANS: 3   REF: 062407ai   NAT: F.LE.A.1   TOP: Families of Functions
4 ANS: 3   REF: 082421ai   NAT: A.APR.B.3   TOP: Zeros of Polynomials
5 ANS: 1   REF: fall2301ai   NAT: N.RN.B.3   TOP: Operations with Radicals
   KEY: addition
6 ANS: 3   REF: 082411ai   NAT: F.BF.B.3   TOP: Transformations with Functions
7 ANS: 4
   $6.4 - 4x \geq -2.8$

   $9.2 \geq 4x$

   $2.3 \geq x$

   REF: 012522ai   NAT: A.REI.B.3   TOP: Solving Linear Inequalities
8 ANS: 3   REF: 062423ai   NAT: N.Q.A.1   TOP: Conversions
9 ANS: 2
   $110 - 60 = 50$

   REF: 062413ai   NAT: S.ID.A.1   TOP: Box Plots   KEY: interpret
10 ANS: 4   REF: 012507ai   NAT: A.REI.D.12   TOP: Graphing Systems of Linear Inequalities
11 ANS: 1   REF: 012517ai   NAT: F.IF.B.5   TOP: Domain and Range
   KEY: graph
12 ANS: 1

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

   REF: 012510ai   NAT: S.ID.B.5   TOP: Frequency Tables
   KEY: two-way
13 ANS: 3

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

   REF: 082414ai   NAT: S.ID.B.5   TOP: Frequency Tables
   KEY: two-way
14 ANS: 4
   $-2x^2 + 4x - 2 + 3x^2 + 3x - 5 = x^2 + 7x - 7$

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

15 ANS: 4

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

$3x^2 - 6x + 9 - 4x^2 - 3x + 1$

$-x^2 - 9x + 10$

REF: 082403ai   NAT: A.APR.A.1   TOP: Operations with Polynomials
KEY: subtraction

16 ANS: 3

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

$3 = b$

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

17 ANS: 2

$6 - ax = ax - 2$

$8 = 2ax$

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

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

REF: 082420ai   NAT: A.REI.B.3   TOP: Solving Linear Equations
KEY: coefficients represented by letters

18 ANS: 1   REF: 062421ai   NAT: F.LE.B.5   TOP: Modeling Linear Functions

19 ANS: 2

$\dfrac{4(x - 5)}{3} = 12$

$4x - 20 = 36$

$4x = 56$

$x = 14$

REF: 062406ai   NAT: A.REI.B.3   TOP: Solving Linear Equations

20 ANS: 2   REF: 012505ai   NAT: F.LE.B.5   TOP: Modeling Linear Functions

21 ANS: 1   REF: 082405ai   NAT: A.SSE.A.1   TOP: Modeling Expressions

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

23 ANS: 3   REF: 062408ai   NAT: A.SSE.A.1   TOP: Modeling Expressions

24 ANS: 1

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

REF: 012508ai   NAT: F.BF.A.1   TOP: Sequences   KEY: explicit

25 ANS: 4

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

REF: 062419ai   NAT: A.APR.A.1   TOP: Operations with Polynomials
KEY: multiplication

26 ANS: 2

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

$3 = 3$

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

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

28 ANS: 3

77 78 81 84 86 88 93 95
   79.5   90.5
     90.5-79.5=11

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

29 ANS: 2

$25r^2 = 625$

$r^2 = 25$

$r = \pm 5$

REF: 062412ai   NAT: F.IF.A.3   TOP: Sequences   KEY: difference or ratio

30 ANS: 1   REF: 082402ai   NAT: F.LE.A.1   TOP: Families of Functions

31 ANS: 1

$\dfrac{55 - 0}{5.5 - 0} = 10$

REF: 062418ai   NAT: F.IF.B.6   TOP: Rate of Change

32 ANS: 4

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

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

$-16 \le 4m$

$-4 \le m$

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

33 ANS: 3

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

REF: 012501ai   NAT: A.SSE.A.2   TOP: Factoring the Difference of Perfect Squares

34 ANS: 4

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

REF: fall2302ai   NAT: A.REI.D.10   TOP: Writing Linear Equations
KEY: other forms

35 ANS: 3

$$x^2 - 5x - 14 = x + 2$$

$$x^2 - 6x - 16 = 0$$

$$(x-8)(x+2) = 0$$

$$x = 8, -2$$

REF: 082416ai   NAT: A.REI.D.11   TOP: Quadratic-Linear Systems

36 ANS: 2

$$p = 2l + 2w$$

$$p - 2l = 2w$$

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

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

37 ANS: 4

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

REF: 082415ai   NAT: N.RN.B.3   TOP: Operations with Radicals
KEY: addition

38 ANS: 2

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

REF: 062416ai   NAT: S.ID.A.1   TOP: Dot Plots
39 ANS: 4   REF: 082406ai   NAT: A.REI.A.1   TOP: Identifying Properties
40 ANS: 4   REF: 082401ai   NAT: A.SSE.A.2   TOP: Factoring Polynomials
41 ANS: 1   REF: 082412ai   NAT: F.LE.B.5   TOP: Modeling Linear Functions
42 ANS: 4

$$\frac{8}{2} = 4$$

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

43 ANS: 1

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

REF: 062411ai   NAT: F.LE.A.3   TOP: Families of Functions
44 ANS: 3   REF: 012513ai   NAT: F.LE.A.1   TOP: Families of Functions

45 ANS: 4

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

REF: 082417ai   NAT: A.APR.A.1   TOP: Operations with Polynomials
KEY: multiplication

46 ANS: 4   REF: 082407ai   NAT: N.RN.B.3   TOP: Operations with Radicals
KEY: classify

47 ANS: 2   REF: 082404ai   NAT: A.CED.A.1   TOP: Modeling Linear Equations

48 ANS: 1

$m = \dfrac{8 - -2}{-1 - 4} = \dfrac{10}{-5} = -2$ $y = mx + b$

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

$\quad\quad\quad\quad\quad\quad\quad\quad\quad 6 = b$

REF: 012502ai   NAT: A.REI.D.10   TOP: Writing Linear Equations
KEY: slope-intercept form

49 ANS: 1   REF: 012504ai   NAT: A.SSE.A.1   TOP: Modeling Expressions

50 ANS: 4   REF: 012515ai   NAT: N.RN.B.3   TOP: Operations with Radicals
KEY: addition

51 ANS: 1

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

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

52 ANS: 3

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

REF: 082409ai   NAT: S.ID.A.1   TOP: Box Plots   KEY: represent

53 ANS: 2

$3x - ax = 12$

$x(3 - a) = 12$

$\quad\quad x = \dfrac{12}{3 - a}$

REF: 062422ai   NAT: A.REI.B.3   TOP: Solving Linear Equations
KEY: coefficients represented by letters

54 ANS: 2   REF: 062415ai   NAT: F.BF.A.1   TOP: Sequences
KEY: explicit

55 ANS: 4   REF: 012519ai   NAT: N.Q.A.1   TOP: Conversions

56 ANS: 3

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

REF: 082423ai   NAT: F.IF.A.3   TOP: Sequences   KEY: difference or ratio

57 ANS: 2
$$5^{a+2b} = 5^a \bullet 5^{2b} = 5^a \bullet 25^b$$

REF: 082422ai   NAT: A.APR.A.1   TOP: Multiplication of Powers
58 ANS: 4   REF: 062417ai   NAT: F.BF.B.3   TOP: Transformations with Functions
59 ANS: 2   REF: 062402ai   NAT: A.CED.A.3   TOP: Modeling Systems of Linear Inequalities
60 ANS: 1   REF: 082418ai   NAT: A.REI.D.10   TOP: Writing Linear Equations
KEY: other forms
61 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.

REF: 062424ai   NAT: F.IF.A.2   TOP: Domain and Range
62 ANS: 2   REF: 012506ai   NAT: A.APR.A.1   TOP: Operations with Polynomials
KEY: subtraction
63 ANS: 4   REF: 012521ai   NAT: F.BF.B.3   TOP: Transformations with Functions
KEY: bimodalgraph
64 ANS: 4   REF: 082424ai   NAT: N.Q.A.1   TOP: Conversions
65 ANS: 2
$$x^2 + 6x = 18$$
$$x^2 + 6x + 9 = 18 + 9$$
$$(x+3)^2 = 27$$

REF: 082408ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: completing the square
66 ANS: 3   REF: 012512ai   NAT: A.APR.A.1   TOP: Multiplication of Powers
67 ANS: 2   REF: 062409ai   NAT: A.APR.B.3   TOP: Zeros of Polynomials
68 ANS: 1   REF: 012516ai   NAT: S.ID.A.1   TOP: Dot Plots
69 ANS: 1   REF: 062420ai   NAT: A.REI.D.11   TOP: Quadratic-Linear Systems
70 ANS: 1
$$-2(3x-5) = \frac{9}{2}x - 2$$
$$-4(3x-5) = 9x - 4$$
$$-12x + 20 = 9x - 4$$
$$24 = 21x$$
$$x = \frac{24}{21} = \frac{8}{7}$$

REF: 012511ai   NAT: A.REI.B.3   TOP: Solving Linear Equations
71 ANS: 4   REF: 012514ai   NAT: A.REI.A.1   TOP: Identifying Properties

72 ANS: 3

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

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

73 ANS: 2

$x + x + 8 \geq 20$

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

74 ANS: 1   REF: 062405ai   NAT: N.RN.B.3   TOP: Operations with Radicals
    KEY: classify

Algebra I 2 Point Regents Exam Questions
Answer Section

75 ANS:

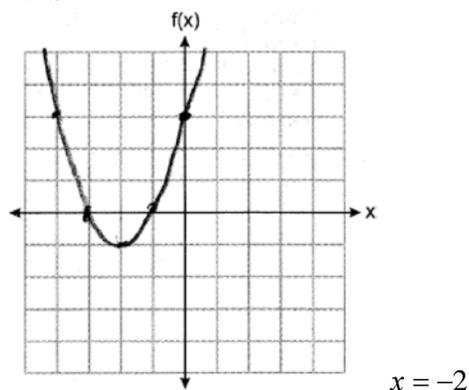| x	−1	0	1	2	2
y	2	4	4	5	4

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

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

76 ANS:

$x = -2$

REF: 012526ai   NAT: F.IF.C.7   TOP: Graphing Quadratic Functions

77 ANS:

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

$(x + 4)^2 = 49$

$x + 4 = \pm 7$

$x = -11, 3$

REF: 012528ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: completing the square

78 ANS:

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

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

79 ANS:

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

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

80 ANS:

$$x^2 + 10x = 30$$

$$x^2 + 10x + 25 = 30 + 25$$

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

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

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

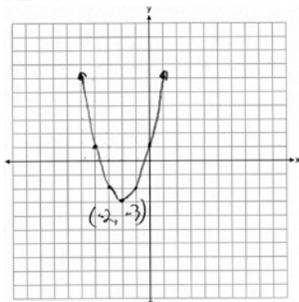REF: 062429ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: completing the square

81 ANS:

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

REF: 012527ai   NAT: F.IF.A.1   TOP: Defining Functions

82 ANS:

REF: 082425ai   NAT: F.IF.C.7   TOP: Graphing Quadratic Functions

83 ANS:

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

REF: 082429ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: quadratic formula

84 ANS:

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

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

85 ANS:

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

REF: fall2303ai   NAT: N.RN.B.3   TOP: Operations with Radicals
KEY: division

86 ANS:

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

$-44 = -3x - 5$

$-39 = -3x$

$13 = x$

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

87 ANS:

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

$2x \le 30$

$x \le 15$

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

88 ANS:

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

REF: 082430ai   NAT: A.SSE.A.2   TOP: Factoring the Difference of Perfect Squares

89 ANS:

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

$x - 3 = 7x - 150$

$147 = 6x$

$24.5 = x$

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

90 ANS:

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

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

91 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

REF: 062428ai   NAT: S.ID.B.5   TOP: Frequency Tables
KEY: two-way

92 ANS:

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

REF: 012530ai   NAT: N.RN.B.3   TOP: Operations with Radicals
KEY: division

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

REF: 062427ai   NAT: F.IF.A.1   TOP: Defining Functions
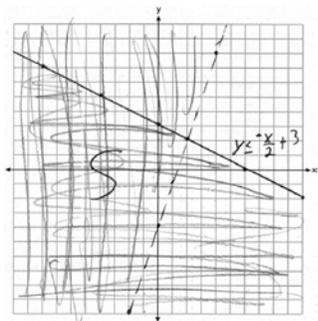
Algebra I 4 Point Regents Exam Questions
Answer Section

94 ANS:
$y = 15.13x - 959.63$, 0.99, strong

REF: 082431ai   NAT: S.ID.B.6   TOP: Regression   KEY: linear with correlation coefficient

95 ANS:

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

REF: 082432ai   NAT: A.REI.D.12   TOP: Graphing Systems of Linear Inequalities

96 ANS:

$$n + d = 25 \quad n + 9 = 25$$
$$5n + 10d = 170 \qquad n = 16$$
$$5(25 - d) + 10d = 170$$
$$125 - 5d + 10d = 170$$
$$5d = 45$$
$$d = 9$$

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

97 ANS:

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

REF: fall2305ai   NAT: A.REI.C.7   TOP: Quadratic-Linear Systems

ID: A

98 ANS:

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

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

$$0 = t^2 - 4t - 5$$
$$0 = (t - 5)(t + 1)$$
$$t = 5$$

REF: 082433ai   NAT: F.IF.B.4   TOP: Graphing Quadratic Functions
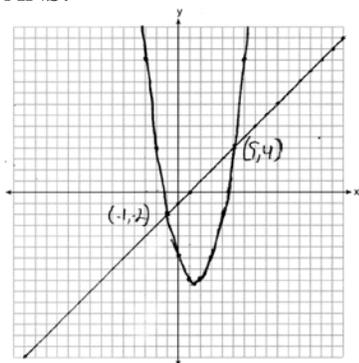KEY: key features

99 ANS:

$y = 9.1x - 527.6$, 0.9, strong relationship

REF: 012532ai   NAT: S.ID.B.6   TOP: Regression   KEY: linear with correlation coefficient

100 ANS:

REF: 062431ai   NAT: A.REI.C.7   TOP: Quadratic-Linear Systems

101 ANS:

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

REF: 012533ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: quadratic formula

102 ANS:

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

REF: 062433ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: quadratic formula

103 ANS:

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

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

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

$\quad\quad x = 6,3$

REF: 012534ai   NAT: A.REI.C.7   TOP: Quadratic-Linear Systems

104 ANS:

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

$\quad x^2 + 2x - 8 = 0$ $\quad y = 2(2) + 7 = 11$

$\quad (x + 4)(x - 2) = 0$

$\quad\quad x = -4,2$

REF: 082434ai   NAT: A.REI.C.7   TOP: Quadratic-Linear Systems

105 ANS:

$x^2 + 6x + 9 = 41 + 9$

$\quad (x + 3)^2 = 50$

$\quad\quad x + 3 = \pm\sqrt{50}$

$\quad\quad\quad x = -3 \pm 5\sqrt{2}$

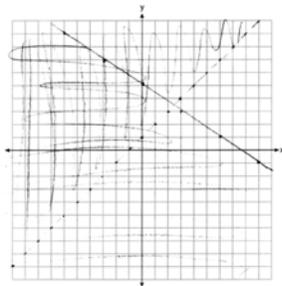REF: fall2304ai   NAT: A.REI.B.4   TOP: Solving Quadratics
KEY: completing the square

106 ANS:

$y = -37.57x + 215.67$, -0.98, strong

REF: 062432ai   NAT: S.ID.B.6   TOP: Regression   KEY: linear with correlation coefficient
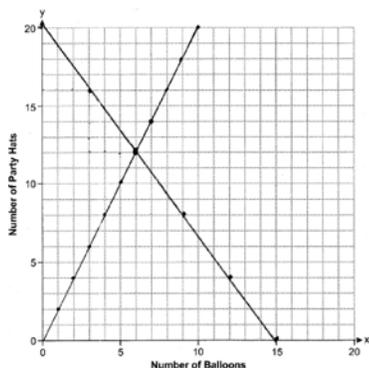
107 ANS:

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

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

Algebra 1 6 Point Regents Exam Questions
Answer Section

108 ANS:

$2x + 1.5y = 30$ (6,12) is the intersection, meaning Anna bought 6 baloons and 12

$y = 2x$

hats.

REF: 012535ai   NAT: A.REI.C.6   TOP: Graphing Linear Systems

109 ANS:

$4x + 2y = 15.5$ $5(4x + 2y = 15.5)$ Courtney is incorrect because of the following calculations: $20x + 10y = 77.5$

$3x + 5y = 18.1$ $2(3x + 5y = 18.1)$ $6x + 10y = 36.2$

$14x = 41.3$

$x = 2.95$

$4(2.95) + 2y = 15.5$

$11.8 + 2y = 15.5$

$2y = 3.7$

$y = 1.85$

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

110 ANS:

$2m + 3r = 38.5$ Jen is not correct because the prices are $6m + 9r = 115.5$ $2m + 3(8.5) = 38.5$

$6m + r = 47.5$ $6m + r = 47.5$ $2m + 25.5 = 38.5$

$8r = 68$ $2m = 13$

$r = 8.50$ $m = 6.50$

REF: 082435ai   NAT: A.CED.A.3   TOP: Modeling Linear Systems