# JMAP
# REGENTS BY TYPE

The NY Algebra I Regents Exams Questions
from Fall 2023 to August 2024 Sorted by Type

www.jmap.org

# Algebra I Multiple Choice Regents Exam Questions

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

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

3 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

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

5 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

6 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.

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

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

9 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

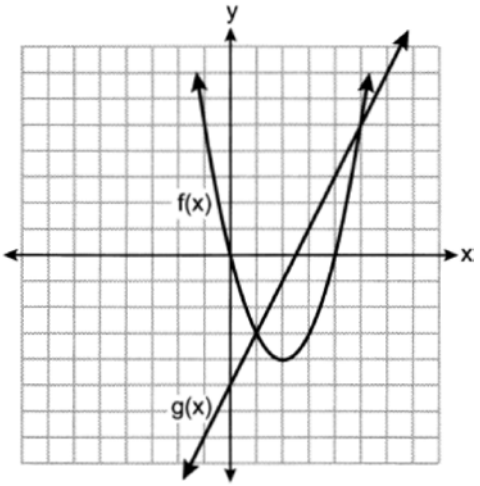
10 On an island, a rare breed of rabbit doubled its population each month for two years. Which type of function best models the increase in population at the end of two years?
1) linear growth
2) linear decay
3) exponential growth
4) exponential decay

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

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

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

14 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

15 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) $4x^3 - 5x^2 + 3$

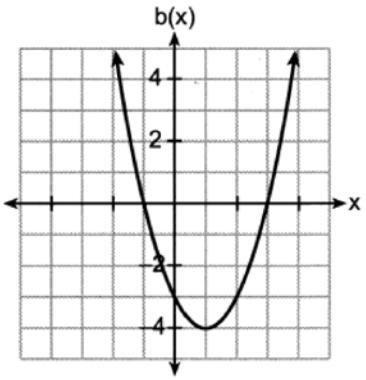
16 Four quadratic functions are represented below.

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

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

17 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

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

19 What is the degree of the polynomial $2x - x^2 + 4x^3$?

1) 1
2) 2
3) 3
4) 4

20 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.

21 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.

22 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) $4a^3 - 21a^2 + 8a - 15$

23 The expression $5^{a+2b}$ is equivalent to

1) $5^a \bullet 5^2 \bullet 5^b$
2) $5^a \bullet 25^b$
3) $25^{2ab}$
4) $25^{a+2b}$

24 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

25 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) $(x+6)^2 = 27$

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

27 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) $5x^2\sqrt{14}$

28 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) $a + c \leq 48$
$18a + 12c \leq 650$

29 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) $y + 3 = 2(x + 7)$

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

31 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

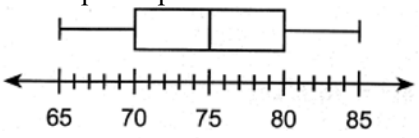
32 At Adelynn's first birthday party, each guest brought \$1 in coins for her piggy bank. Guests brought nickels, dimes, and quarters for a total of \$28. There were twice as many dimes as nickels and 12 more quarters than nickels. Which equation could be used to determine the number of nickels, $x$,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

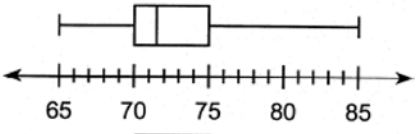
1) $.05x + .10x + .25x = 28$
2) $.05x + .10(2x) + .25(x + 12) = 28$
3) $.05(2x) + .10x + .25(x + 12) = 28$
4) $.05(x + 12) + .10(2x) + .25x = 28$

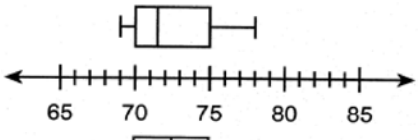
33 The heights, in inches, of eight football players are given below.

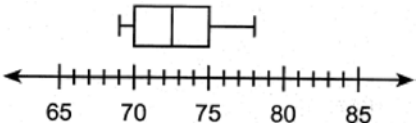
76, 70, 72, 70, 69, 71, 78, 74

Which box plot represents these data?

1) 


2) 


3) 


4) 

34 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

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

1) $\frac{12}{3a}$
2) $\frac{12}{3-a}$
3) $\frac{3a}{12}$
4) $\frac{3-a}{12}$

36 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

37 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) $\frac{2}{a}$

38 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) $k(x) = (x-1)(x+3)(x+4)$

39 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.

$a(t) = 2^t + 25$
$b(t) = 10t + 75$
$c(t) = \sqrt{400t} + 80$
$d(t) = 2(t+1)^2 - 10t + 50$

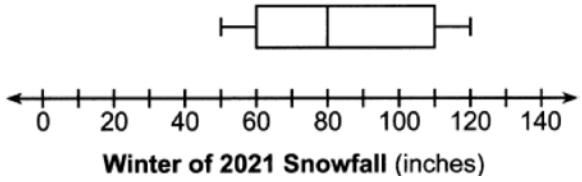
Which pay plan should Nancy choose in order to have the highest salary in her eighth year?

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

40 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) $4,-12,36,-108,\ldots$

41 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) $m \ge -4$

42 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.

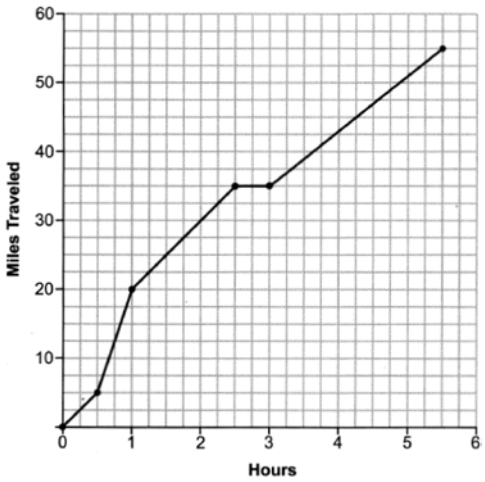



What is the interquartile range?
1) 30
2) 50
3) 80
4) 110

43 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) $7^a \bullet 7^b = 7^{ab}$

44 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) $2x^2-4x-40$

45 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

46 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

47 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

48 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) $k(x) = (x-4)^2 + 3$

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

50 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

## Algebra I 2 Point Regents Exam Questions

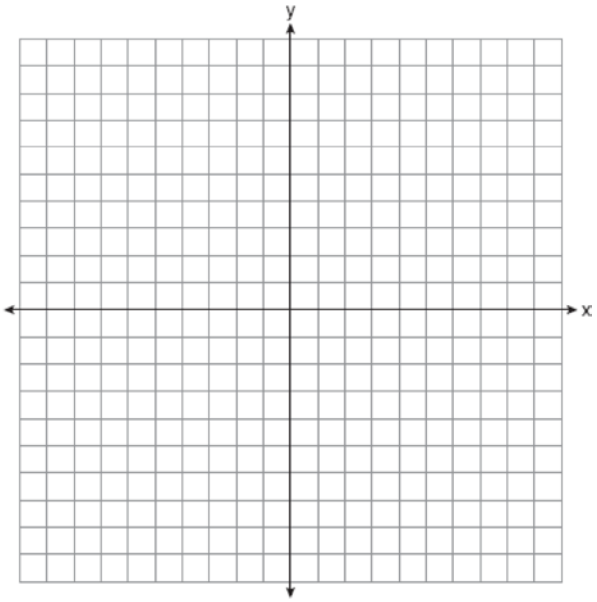
51 Explain why the relation shown in the table below is a function.

| **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 | |

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




State the coordinates of the minimum.

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

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

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

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

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

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

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

60 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** | | | |

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

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

63 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

64 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.

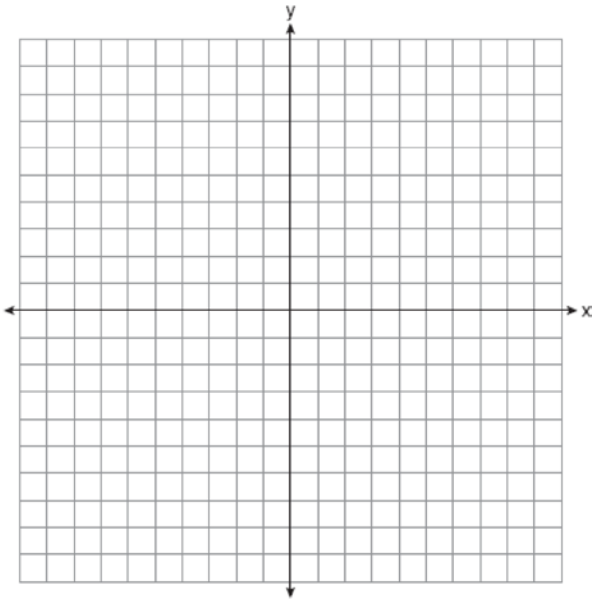
65 Graph the system of inequalities on the set of axes below:

$$y > 3x - 4$$

$$x + 2y \leq 6$$

Label the solution set *S*.

.




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

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

67 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.

68 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.

69 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.

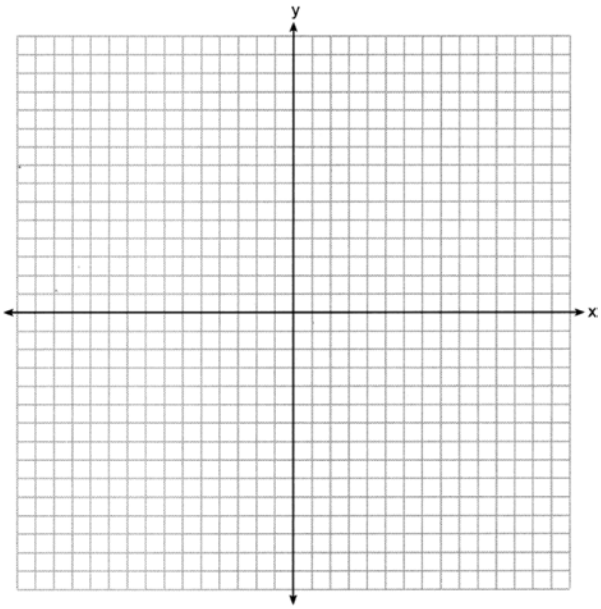
| **Average Daily Temp.** (x) | 72 | 75 | 81 | 78 | 77 | 76 | 80 |
|---|---|---|---|---|---|---|---|
| **Daily Ice Cream Cone Sales** (y) | 126 | 183 | 263 | 229 | 200 | 185 | 249 |

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.

70 Graph the following system of equations on the set of axes below.

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

$$y = x - 1$$

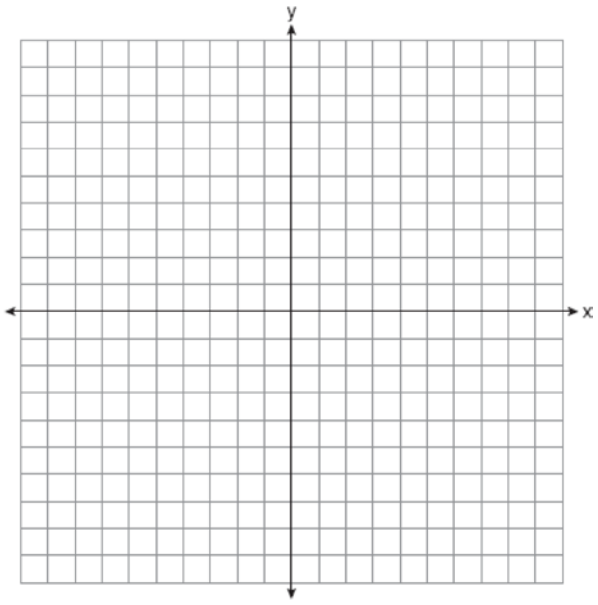



State the coordinates of all solutions.

71 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.

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

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

$$y = 2x + 7$$

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

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

$$x - y = 5$$

## Algebra 1 6 Point Regents Exam Questions

74 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.

75 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

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

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

2 ANS: 2

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

$4x - 20 = 36$

$4x = 56$

$x = 14$

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

3 ANS: 3

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

$3 = b$

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

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

5 ANS: 2

$25r^2 = 625$

$r^2 = 25$

$r = \pm 5$

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

6 ANS: 4 REF: 062417ai NAT: F.BF.B.3 TOP: Transformations with Functions

7 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

8 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

9 ANS: 3

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

REF: 082414ai NAT: S.ID.B.5 TOP: Frequency Tables
KEY: two-way

10 ANS: 3 REF: 062407ai NAT: F.LE.A.1 TOP: Families of Functions

11 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

12 ANS: 4 REF: 082401ai NAT: A.SSE.A.2 TOP: Factoring Polynomials

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

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

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

16 ANS: 1

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

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

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

18 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

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

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

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

22 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

23 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

24 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

25 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

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

27 ANS: 1 REF: fall2301ai NAT: N.RN.B.3 TOP: Operations with Radicals
KEY: addition

28 ANS: 2 REF: 062402ai NAT: A.CED.A.3 TOP: Modeling Systems of Linear Inequalities

29 ANS: 1 REF: 082418ai NAT: A.REI.D.10 TOP: Writing Linear Equations
KEY: other forms

30 ANS: 3 REF: 062423ai NAT: N.Q.A.1 TOP: Conversions

31 ANS: 4 REF: 082406ai NAT: A.REI.A.1 TOP: Identifying Properties

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

33 ANS: 3

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

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

34 ANS: 2

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

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

35 ANS: 2

$3x - ax = 12$

$x(3 - a) = 12$

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

REF: 062422ai NAT: A.CED.A.4 TOP: Transforming Formulas

36 ANS: 2 REF: 062409ai NAT: A.APR.B.3 TOP: Zeros of Polynomials

37 ANS: 2

$6 - ax = ax - 2$

$8 = 2ax$

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

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

REF: 082420ai NAT: A.CED.A.4 TOP: Transforming Formulas

38 ANS: 3 REF: 082421ai NAT: A.APR.B.3 TOP: Zeros of Polynomials

39 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

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

41 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

42 ANS: 2

$110 - 60 = 50$

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

43 ANS: 1 REF: 062403ai NAT: A.APR.A.1 TOP: Multiplication of Powers

44 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

45 ANS: 1

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

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

46 ANS: 3

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

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

47 ANS: 3

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

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

48 ANS: 3 REF: 082411ai NAT: F.BF.B.3 TOP: Transformations with Functions

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

50 ANS: 1 REF: 082412ai NAT: F.LE.B.5 TOP: Modeling Linear Functions

# Algebra I 2 Point Regents Exam Questions
# Answer Section

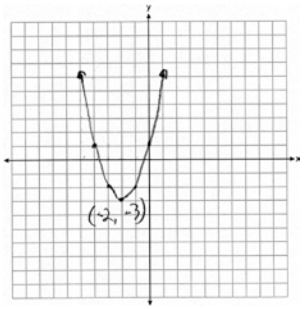
51 ANS:

| 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

52 ANS:




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

53 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

54 ANS:

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

$$2x \le 30$$

$$x \le 15$$

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

55 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

56 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

57 ANS:

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

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

58 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

59 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

60 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

61 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

62 ANS:

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

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

63 ANS:

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

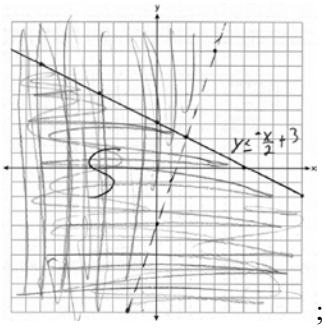
REF: 062427ai NAT: F.IF.A.1 TOP: Defining Functions

# Algebra I 4 Point Regents Exam Questions
## Answer Section

64 ANS:
$y = -37.57x + 215.67,\ -0.98$, strong

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

65 ANS:




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

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

66 ANS:

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

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

67 ANS:

$t = \frac{-64}{2(-16)} = 2$ $h(2) = -16(2)^2 + 64(2) + 80 = -64 + 128 + 80 = 144$ $(2, 144)$. 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

68 ANS:

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

$(x+3)^2 = 50$

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

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

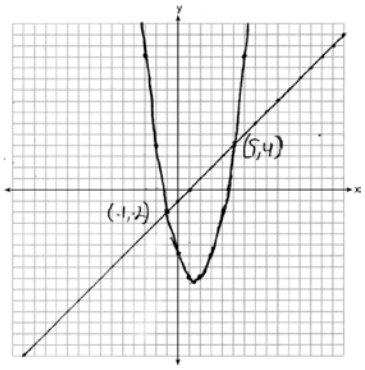
REF: fall2304ai NAT: A.REI.B.4 TOP: Solving Quadratics
KEY: completing the square

69 ANS:

$y = 15.13x - 959.63$, 0.99, strong

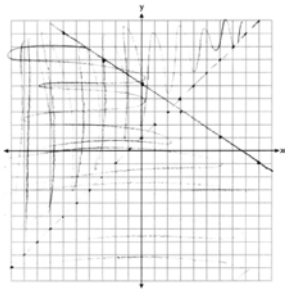
REF: 082431ai NAT: S.ID.B.6 TOP: Regression KEY: linear with correlation coefficient

70 ANS:




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

71 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

72 ANS:

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

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

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

$x = -4, 2$

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

73 ANS:

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

$x^2 + 4x - 12 = 0$ $y = -11$ $y = -3$

$(x + 6)(x - 2) = 0$

$x = -6, 2$

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

# Algebra 1 6 Point Regents Exam Questions
## Answer Section

74 ANS:

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

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

$14x = 41.3$

$x = 2.95$

$4(2.95) + 2y = 15.5$

$11.8 + 2y = 15.5$

$2y = 3.7$

$y = 1.85$

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

75 ANS:

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

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

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

$r = 8.50 \quad m = 6.50$

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