# JEFFERSON MATH PROJECT
# REGENTS BY TYPE

## The NY Integrated Algebra Regents Exams
## Fall 2007-August 2010
### (Answer Key)

## www.jmap.org

Dear Sir

I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

# Integrated Algebra Multiple Choice Regents Exam Questions
## Answer Section

1 ANS: 4                REF: fall0717ia     STA: A.G.4         TOP: Families of Functions

2 ANS: 4

The mean is $80.\overline{6}$, the median is 84.5 and the mode is 87.

    REF: 010907ia     STA: A.S.4        TOP: Central Tendency

3 ANS: 4                REF: fall0704ia     STA: A.A.29        TOP: Set Theory

4 ANS: 3

$$\frac{12x^3 - 6x^2 + 2x}{2x} = \frac{2x(6x^2 - 3x + 1)}{2x} = 6x^2 - 3x + 1$$

    REF: 011011ia     STA: A.A.14        TOP: Rational Expressions

5 ANS: 3

$$3^2 + 5^2 = x^2$$
$$34 = x^2$$
$$\sqrt{34} = x$$

    REF: 060909ia     STA: A.A.45        TOP: Pythagorean Theorem

6 ANS: 2

The median score, 10, is the vertical line in the center of the box.

    REF: fall0709ia     STA: A.S.5        TOP: Box-and-Whisker Plots

7 ANS: 1

$m = \frac{3-0}{0-2} = -\frac{3}{2}$. Using the given $y$-intercept $(0,3)$ to write the equation of the line $y = -\frac{3}{2}x + 3$.

    REF: fall0713ia     STA: A.A.35        TOP: Writing Linear Equations

8 ANS: 3

$$25 - 18 = 7$$

    REF: 060822ia     STA: A.S.9        TOP: Frequency Histograms, Bar Graphs and Tables

9 ANS: 2
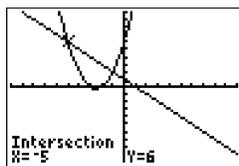


$x^2 + 5x + 6 = -x + 1.$  $y = -x + 1$

$$x^2 + 6x + 5 = 0 \qquad = -(-5) + 1$$
$$(x + 5)(x + 1) = 0 \qquad = 6$$
$$x = -5 \text{ or } -1$$

    REF: 080812ia     STA: A.A.11        TOP: Quadratic-Linear Systems

10  ANS:  2

If the car can travel 75 miles on 4 gallons, it can travel 300 miles on 16 gallons.  $\dfrac{75}{4} = \dfrac{x}{16}$ .

$$x = 300$$

REF:  080807ia        STA:  A.G.4          TOP:  Graphing Linear Functions

11  ANS:  4                REF:  060916ia        STA:  A.A.15          TOP:  Undefined Rationals

12  ANS:  3

$\sin A = \dfrac{10}{16}$   $B = 180 - (90 = 38.7) = 51.3.$   A 90º angle is not acute.

$A \approx 38.7$

REF:  080829ia        STA:  A.A.43          TOP:  Using Trigonometry to Find an Angle

13  ANS:  1

$15000(1.2)^{\frac{6}{3}} = 21,600.$  $21,600 - 15,000 = 6,600$

REF:  061030ia        STA:  A.A.9          TOP:  Exponential Functions

14  ANS:  4
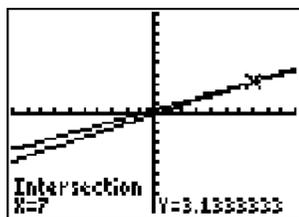


$$\frac{2x}{5} + \frac{1}{3} = \frac{7x - 2}{15}$$

$$\frac{(2x \times 3) + (5 \times 1)}{5 \times 3} = \frac{7x - 2}{15}$$

$$\frac{6x + 5}{15} = \frac{7x - 2}{15}$$

$$6x + 5 = 7x - 2$$

$$x = 7$$

REF:  080820ia        STA:  A.A.25          TOP:  Solving Equations with Fractional Expressions

15  ANS:  4

$-4x + 2 > 10$

$-4x > 8$

$x < -2$

REF:  080805ia        STA:  A.A.21          TOP:  Interpreting Solutions

16  ANS:  2                REF:  010915ia        STA:  A.A.5          TOP:  Modeling Equations

17 ANS: 3
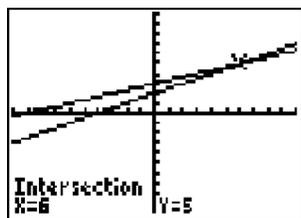


$$\frac{k+4}{2} = \frac{k+9}{3}$$

$$3(k+4) = 2(k+9)$$

$$3k+12 = 2k+18$$

$$k = 6$$

REF: 010906ia     STA: A.A.26     TOP: Solving Rationals

18 ANS: 2     REF: 080810ia     STA: A.A.36     TOP: Parallel and Perpendicular Lines

19 ANS: 1     REF: 011004ia     STA: A.A.31     TOP: Set Theory

20 ANS: 1

$$\frac{1}{8} \times \frac{1}{8} = \frac{1}{64}$$

REF: 010928ia     STA: A.S.23     TOP: Theoretical Probability

KEY: independent events

21 ANS: 1

$$y = mx + b$$

$$-6 = (-3)(4) + b$$

$$b = 6$$

REF: 060922ia     STA: A.A.34     TOP: Writing Linear Equations

22 ANS: 4

$$\frac{(d \times 3) + (2 \times 2d)}{2 \times 3} = \frac{3d + 4d}{6} = \frac{7d}{6}$$

REF: fall0727ia     STA: A.A.17     TOP: Addition and Subtraction of Rationals

23 ANS: 2

$$x + 2y = 9$$

$$x - y = 3$$

$$3y = 6$$

$$y = 2$$

REF: 060925ia     STA: A.A.10     TOP: Solving Linear Systems

24  ANS:  2

$s + o = 126.$ $s + 2s = 126$

$\quad o = 2s \qquad s = 42$

REF:  080811ia     STA:  A.A.7     TOP:  Writing Linear Systems

25  ANS:  2

Debbie failed to distribute the 3 properly.

REF:  011009ia     STA:  A.A.22     TOP:  Solving Equations

26  ANS:  1

$x - 2y = 1$

$x + 4y = 7$

$\quad -6y = -6$

$\quad\quad y = 1$

REF:  080920ia     STA:  A.A.10     TOP:  Solving Linear Systems

27  ANS:  4

$\quad w(w + 5) = 36$

$w^2 + 5w - 36 = 0$

REF:  fall0726ia     STA:  A.A.5     TOP:  Modeling Equations

28  ANS:  3

0.75 hours = 45 minutes.  $\dfrac{120}{1} = \dfrac{x}{45}$

$\quad\quad\quad x = 5400$

REF:  080814ia     STA:  A.M.1     TOP:  Using Rate

29  ANS:  4     REF:  060906ia     STA:  A.A.4     TOP:  Modeling Inequalities

30  ANS:  2     REF:  011015ia     STA:  A.G.10

TOP:  Identifying the Vertex of a Quadratic Given Graph

31  ANS:  2

$m = \dfrac{5-3}{8-1} = \dfrac{2}{7}$  $y - y_1 = m(x - x_i)$

$\quad\quad\quad y - 5 = \dfrac{2}{7}(x - 8)$

REF:  081029ia     STA:  A.A.35     TOP:  Writing Linear Equations

32  ANS: 1
$$3(2m - 1) \le 4m + 7$$
$$6m - 3 \le 4m + 7$$
$$2m \le 10$$
$$m \le 5$$

REF: 081002ia    STA: A.A.24    TOP: Solving Inequalities

33  ANS: 2
$$l(l - 5) = 24$$
$$l^2 - 5l - 24 = 0$$
$$(l - 8)(l + 3) = 0$$
$$l = 8$$

REF: 080817ia    STA: A.A.8    TOP: Geometric Applications of Quadratics

34  ANS: 2
$$\sin U = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{15}{17}$$

REF: 010919ia    STA: A.A.42    TOP: Trigonometric Ratios

35  ANS: 3    REF: fall0706ia    STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

36  ANS: 4    REF: 011020ia    STA: A.A.12    TOP: Multiplication of Powers

37  ANS: 2
$y - kx = 7$ may be rewritten as $y = kx + 7$

REF: 061015ia    STA: A.A.38    TOP: Parallel and Perpendicular Lines

38  ANS: 4    REF: 061028ia    STA: A.G.6    TOP: Linear Inequalities

39  ANS: 1    REF: 060804ia    STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

40  ANS: 2
$$\frac{6}{5x} - \frac{2}{3x} = \frac{18x - 10x}{15x^2} = \frac{8x}{15x^2} = \frac{8}{15x}$$

REF: 010921ia    STA: A.A.17    TOP: Addition and Subtraction of Rationals

41  ANS: 1    REF: 060807ia    STA: A.A.13    TOP: Multiplication of Polynomials

42  ANS: 2
$$\frac{2x^2 - 12x}{x - 6} = \frac{2x(x - 6)}{x - 6} = 2x$$

REF: 060824ia    STA: A.A.14    TOP: Rational Expressions

43  ANS: 3    REF: 080819ia    STA: A.A.13    TOP: Addition and Subtraction of Polynomials
KEY: subtraction

44  ANS:  1

$$8^2 + 15^2 = c^2$$

$$c^2 = 289$$

$$c = 17$$

REF:  080906ia        STA:  A.A.45        TOP:  Pythagorean Theorem

45  ANS:  2

$$1.5^3 = 3.375$$

REF:  060809ia        STA:  A.G.2        TOP:  Volume

46  ANS:  2

$$5\sqrt{20} = 5\sqrt{4}\sqrt{5} = 10\sqrt{5}$$

REF:  080922ia        STA:  A.N.2        TOP:  Simplifying Radicals

47  ANS:  1        REF:  fall0728ia        STA:  A.A.15        TOP:  Undefined Rationals

48  ANS:  4

$$5(x + 4) = 5x + 20$$

REF:  081013ia        STA:  A.A.1        TOP:  Expressions

49  ANS:  1        REF:  080824ia        STA:  A.A.43        TOP:  Using Trigonometry to Find an Angle

50  ANS:  1

$$x^2 + 7x + 10 = 0$$

$$(x + 5)(x + 2) = 0$$

$$x = -5 \text{ or } -2$$

REF:  080918ia        STA:  A.A.15        TOP:  Undefined Rationals

51  ANS:  3        REF:  fall0710ia        STA:  A.A.31        TOP:  Set Theory

52  ANS:  1

$$0.07m + 19 \le 29.50$$

$$0.07m \le 10.50$$

$$m \le 150$$

REF:  010904ia        STA:  A.A.6        TOP:  Modeling Inequalities

53  ANS:  4



REF:  080822ia        STA:  A.S.8        TOP:  Scatter Plots

6

54 ANS: 4        REF: 060927ia      STA: A.N.4       TOP: Operations with Scientific Notation

55 ANS: 3

The value of the upper quartile is the last vertical line of the box.

     REF: 060915ia      STA: A.S.6       TOP: Box-and-Whisker Plots

56 ANS: 1        REF: 061005ia      STA: A.G.10

     TOP: Identifying the Vertex of a Quadratic Given Graph

57 ANS: 3

$$x^2 - 9 = 0$$

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

$$x = \pm 3$$

     REF: 061014ia      STA: A.A.15       TOP: Undefined Rationals

58 ANS: 3

The value of the third quartile is the last vertical line of the box.

     REF: 080818ia      STA: A.S.6       TOP: Box-and-Whisker Plots

59 ANS: 1

$$1P + 2C = 5$$

$$1P + 4C = 6$$

$$2C = 1$$

$$C = 0.5$$

     REF: 011003ia      STA: A.A.7       TOP: Writing Linear Systems

60 ANS: 3

$$x^2 - 10x + 21 = 0$$

$$(x-7)(x-3) = 0$$

$$x = 7 \quad x = 3$$

     REF: 010914ia      STA: A.A.28       TOP: Roots of Quadratics

61 ANS: 2

$$2x^2 + 10x - 12 = 2(x^2 + 5x - 6) = 2(x+6)(x-1)$$

     REF: 080806ia      STA: A.A.20       TOP: Factoring Polynomials

62 ANS: 3        REF: 010910ia      STA: A.A.35       TOP: Writing Linear Equations

63 ANS: 3

$$m = \frac{4-10}{3-(-6)} = -\frac{2}{3}$$

     REF: fall0716ia      STA: A.A.33       TOP: Slope

64  ANS: 2

$$\frac{x^2 - 2x - 15}{x^2 + 3x} = \frac{(x-5)(x+3)}{x(x+3)} = \frac{x-5}{x}$$

REF: 060921ia    STA: A.A.16    TOP: Rational Expressions
KEY: a > 0

65  ANS: 2
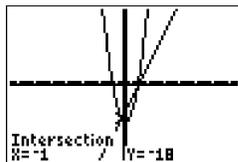


$x^2 - x - 20 = 3x - 15.$  $y = 3x - 15$  .

$\quad x^2 - 4x - 6 = 0 \qquad = 3(-1) - 15$

$\quad (x = 5)(x + 1) = 0 \qquad = -18$

$\quad\quad x = 5 \text{ or } -1$

REF: 010922ia    STA: A.A.11    TOP: Quadratic-Linear Systems

66  ANS: 2    REF: 011002ia    STA: A.S.20    TOP: Theoretical Probability

67  ANS: 2

$$\frac{9x^4 - 27x^6}{3x^3} = \frac{9x^4(1 - 3x^2)}{3x^3} = 3x(1 - 3x^2)$$

REF: fall0718ia    STA: A.A.14    TOP: Rational Expressions

68  ANS: 4

$6\sqrt{50} + 6\sqrt{2} = 6\sqrt{25}\sqrt{2} + 6\sqrt{2} = 30\sqrt{2} + 6\sqrt{2} = 36\sqrt{2}$

REF: 011024ia    STA: A.N.3    TOP: Operations with Radicals
KEY: addition

69  ANS: 4

$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 \approx 1696.5$

REF: fall0712ia    STA: A.G.2    TOP: Volume

70  ANS: 3

$\cos 30 = \dfrac{x}{24}$

$\quad x \approx 21$

REF: 010912ia    STA: A.A.44    TOP: Using Trigonometry to Find a Side

71  ANS: 2    REF: 061027ia    STA: A.A.20    TOP: Factoring Polynomials

72  ANS: 1    REF: 080813ia    STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

73  ANS: 3    REF: 081009ia    STA: A.A.30    TOP: Set Theory

74  ANS: 1    REF: 061021ia    STA: A.A.29    TOP: Set Theory

75  ANS: 4    REF: 061016ia    STA: A.A.2    TOP: Expressions

76 ANS: 1

$$\frac{4x}{x-1} \cdot \frac{x^2-1}{3x+3} = \frac{4x}{x-1} \cdot \frac{(x+1)(x-1)}{3(x+1)} = \frac{4x}{3}$$

REF: 080826ia    STA: A.A.18    TOP: Multiplication and Division of Rationals

77 ANS: 2

$$A = lw + \frac{\pi r^2}{2} = 6 \cdot 5 + \frac{\pi \cdot 3^2}{2} \approx 44.1$$

REF: 061029ia    STA: A.G.1    TOP: Compositions of Polygons and Circles

78 ANS: 3

$3ax + b = c$

$3ax = c - b$

$x = \frac{c-b}{3a}$

REF: 080808ia    STA: A.A.23    TOP: Transforming Formulas

79 ANS: 3    REF: 060924ia    STA: A.G.8    TOP: Solving Quadratics by Graphing

80 ANS: 2    REF: 080901ia    STA: A.A.4    TOP: Modeling Equations

81 ANS: 1

$$\frac{2}{x} - 3 = \frac{26}{x}$$

$$-3 = \frac{24}{x}$$

$$x = -8$$

REF: 010918ia    STA: A.A.25    TOP: Solving Rationals

82 ANS: 4

$5 \times 2 \times 3 = 30$

REF: 061002ia    STA: A.N.7    TOP: Multiplication Counting Principle

83 ANS: 3

$$m = \frac{1-(-4)}{-6-4} = -\frac{1}{2}$$

REF: 060820ia    STA: A.A.33    TOP: Slope

84 ANS: 4    REF: 010927ia    STA: A.N.4    TOP: Operations with Scientific Notation

85 ANS: 4    REF: 011025ia    STA: A.A.17    TOP: Addition and Subtraction of Rationals

86 ANS: 1    REF: 060811ia    STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

87 ANS: 4

Let $x$ = youngest brother and $x + 4$ = oldest brother. $3x - (x + 4) = 48$.

$$2x - 4 = 48$$

$$x = 26$$

REF: 080928ia    STA: A.A.6    TOP: Modeling Equations

88 ANS: 3    REF: fall0702ia    STA: A.S.23    TOP: Theoretical Probability

KEY: mutually exclusive events

89 ANS: 1

$2y - 2x = 10$    axis of symmetry: $x = \dfrac{-b}{2a} = \dfrac{-2}{2(1)} = -1$

$2y = 2x + 10$

$y = x + 5$

REF: 081010ia    STA: A.G.9    TOP: Quadratic-Linear Systems

90 ANS: 2    REF: 010916ia    STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

91 ANS: 2

$L + S = 47$

$L - S = 15$

$2L = 62$

$L = 31$

REF: 060912ia    STA: A.A.7    TOP: Writing Linear Systems

92 ANS: 3

$_6P_4 = 360$

REF: 081028ia    STA: A.N.8    TOP: Permutations

93 ANS: 4

$16^2 + b^2 = 34^2$

$b^2 = 900$

$b = 30$

REF: 080809ia    STA: A.A.45    TOP: Pythagorean Theorem

94 ANS: 4

$y = mx + b$

$-1 = (2)(3) + b$

$b = -7$

REF: 080927ia    STA: A.A.34    TOP: Writing Linear Equations

95 ANS: 1    REF: 011001ia    STA: A.S.6    TOP: Box-and-Whisker Plots

96  ANS: 1

$$m = \frac{4-(-4)}{-5-15} = -\frac{2}{5}$$

REF:  080915ia     STA:  A.A.33     TOP:  Slope

97  ANS: 3

$a + ar = b + r$

$a(1+r) = b + r$

$$a = \frac{b+r}{1+r}$$

REF:  060913ia     STA:  A.A.23     TOP:  Transforming Formulas

98  ANS: 1     REF:  060903ia     STA:  A.A.12     TOP:  Division of Powers

99  ANS: 2     REF:  011012ia     STA:  A.G.9     TOP:  Quadratic-Linear Systems

100  ANS: 2     REF:  060821ia     STA:  A.A.5     TOP:  Modeling Inequalities

101  ANS: 4

$A(-3,4)$ and $B(5,8)$.  $m = \dfrac{4-8}{-3-5} = \dfrac{-4}{-8} = \dfrac{1}{2}$

REF:  011007ia     STA:  A.A.33     TOP:  Slope

102  ANS: 4

$$\frac{25x - 125}{x^2 - 25} = \frac{25(x-5)}{(x+5)(x-5)} = \frac{25}{x+5}$$

REF:  080821ia     STA:  A.A.16     TOP:  Rational Expressions

KEY:  a > 0

103  ANS: 1

$13.95 + 0.49s \le 50.00$

$\qquad 0.49s \le 36.05$

$\qquad\quad s \le 73.57$

REF:  080904ia     STA:  A.A.6     TOP:  Modeling Inequalities

104  ANS: 2     REF:  080802ia     STA:  A.N.1     TOP:  Identifying Properties

105  ANS: 2

The slope of the inequality is $-\dfrac{1}{2}$.

REF:  fall0720ia     STA:  A.G.6     TOP:  Linear Inequalities

106  ANS: 4     REF:  060829ia     STA:  A.G.5     TOP:  Graphing Quadratic Functions

107  ANS: 2     REF:  fall0701ia     STA:  A.S.7     TOP:  Scatter Plots

108  ANS: 4

$A = lw = (3w-7)(w) = 3w^2 - 7w$

REF:  010924ia     STA:  A.A.1     TOP:  Expressions

109  ANS: 4     REF:  061001ia     STA:  A.A.30     TOP:  Set Theory

110 ANS: 2      REF: 081003ia      STA: A.A.31      TOP: Set Theory

111 ANS: 3

$$500(1+0.06)^3 \approx 596$$

     REF: 080929ia      STA: A.A.9      TOP: Exponential Functions

112 ANS: 4

$$\frac{2+3+0+1+3+2+4+0+2+3}{10} = \frac{20}{10} = 2 \quad \frac{x}{10} = 2+0.5$$

$$x = 25$$

     REF: 081020ia      STA: A.S.16      TOP: Average Known with Missing Data

113 ANS: 1      REF: fall0723ia      STA: A.M.3      TOP: Error

114 ANS: 1

$$\left| \frac{289-282}{289} \right| \approx 0.024$$

     REF: 080828ia      STA: A.M.3      TOP: Error

115 ANS: 3

$$m = \frac{7-3}{-3-3} = \frac{4}{-6} = -\frac{2}{3} \quad y = mx+b$$

$$3 = -\frac{2}{3}(3)+b$$

$$3 = -2+b$$

$$5 = b$$

     REF: 011013ia      STA: A.A.35      TOP: Writing Linear Equations

116 ANS: 3

$$|-5(5) + 12| = |-13| = 13$$

     REF: 080923ia      STA: A.N.6      TOP: Evaluating Expressions

117  ANS:  4
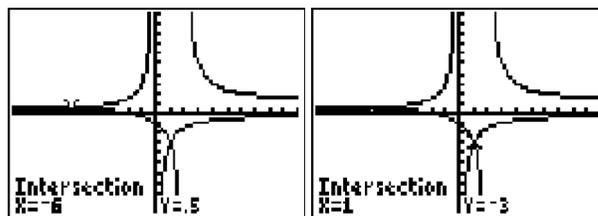
$$\frac{x+2}{x-2} = \frac{-3}{x}$$

$$x(x+2) = -3(x-2)$$

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

$$x^2 + 5x - 6 = 0$$

$$(x+6)(x-1) = 0$$

$$x = -6 \text{ or } 1$$

REF:  011028ia     STA:  A.A.26     TOP:  Solving Rationals

118  ANS:  4     REF:  081011ia     STA:  A.A.5     TOP:  Modeling Equations

119  ANS:  3

$$5x + 2y = 48$$

$$3x + 2y = 32$$

$$2x = 16$$

$$x = 8$$

REF:  fall0708ia     STA:  A.A.7     TOP:  Writing Linear Systems

120  ANS:  3

$$c + 3d = 8 \quad c = 4d - 6$$

$$4d - 6 + 3d = 8 \quad c = 4(2) - 6$$

$$7d = 14 \quad c = 2$$

$$d = 2$$

REF:  061012ia     STA:  A.A.10     TOP:  Solving Linear Systems

121  ANS:  1     REF:  061024ia     STA:  A.A.17     TOP:  Addition and Subtraction of Rationals

122  ANS:  3

$$\sqrt{72} - 3\sqrt{2} = \sqrt{36}\sqrt{2} - 3\sqrt{2} = 6\sqrt{2} - 3\sqrt{2} = 3\sqrt{2}$$

REF:  061008ia     STA:  A.N.3     TOP:  Operations with Radicals
KEY:  subtraction

123  ANS:  2

$$\frac{2}{3x} + \frac{4}{3x} = \frac{9x + 8x}{6x^2} = \frac{17x}{6x^2} = \frac{17}{6x}$$

REF:  080917ia     STA:  A.A.17     TOP:  Addition and Subtraction of Rationals

124  ANS:  4     REF:  010908ia     STA:  A.A.9     TOP:  Exponential Functions

125 ANS: 1        REF: 081015ia     STA: A.G.5      TOP: Graphing Quadratic Functions

126 ANS: 4

$A = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$

REF: 080912ia     STA: A.A.30     TOP: Set Theory

127 ANS: 4

$SA = 2lw + 2hw + 2lh = 2(2)(3) + 2(4)(3) + 2(2)(4) = 52$

REF: 011029ia     STA: A.G.2     TOP: Surface Area

128 ANS: 4

$$s = \frac{d}{t} = \frac{150\,\text{m}}{1.5\,\text{min}} \cdot \frac{60\,\text{min}}{1\,\text{hr}} = 6,000\,\frac{\text{m}}{\text{hr}}$$

REF: 061025ia     STA: A.M.1     TOP: Speed

129 ANS: 3

$$\frac{15}{15 + 13 + 12} = \frac{15}{40} = \frac{3}{8}$$

REF: 061006ia     STA: A.S.21     TOP: Experimental Probability

130 ANS: 4

$$\frac{5}{45} = \frac{8}{x}$$

$$5x = 360$$

$$x = 72$$

REF: 060901ia     STA: A.M.1     TOP: Speed

131 ANS: 2        REF: 010909ia     STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

132 ANS: 3

$$\frac{2 + x}{5x} - \frac{x - 2}{5x} = \frac{2 + x - x + 2}{5x} = \frac{4}{5x}$$

REF: 081027ia     STA: A.A.17     TOP: Addition and Subtraction of Rationals

133 ANS: 4

$$\frac{344\,\text{m}}{\text{sec}} \times \frac{60\,\text{sec}}{1\,\text{min}} \times \frac{60\,\text{min}}{1\,\text{hr}} = 1,238,400\,\frac{\text{m}}{\text{hr}}$$

REF: 060911ia     STA: A.M.2     TOP: Conversions

134 ANS: 2        REF: 080930ia     STA: A.S.17     TOP: Scatter Plots

135  ANS:  4
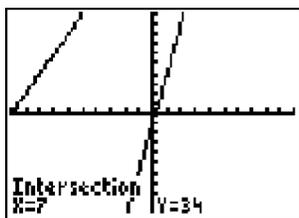


$5p - 1 = 2p + 20$

$3p = 21$

$p = 7$

REF:  080801ia        STA:  A.A.22        TOP:  Solving Equations

136  ANS:  2

$3c + 4m = 12.50$

$3c + 2m = 8.50$

$2m = 4.00$

$m = 2.00$

REF:  060806ia        STA:  A.A.7        TOP:  Writing Linear Systems

137  ANS:  2        REF:  061023ia        STA:  A.A.23        TOP:  Transforming Formulas

138  ANS:  4        REF:  080827ia        STA:  A.A.12        TOP:  Powers of Powers

139  ANS:  2

$\left| \dfrac{149.6 - 174.2}{149.6} \right| \approx 0.1644$

REF:  080926ia        STA:  A.M.3        TOP:  Error

140  ANS:  3        REF:  060808ia        STA:  A.N.8        TOP:  Permutations

141  ANS:  1        REF:  080902ia        STA:  A.A.19

TOP:  Factoring the Difference of Perfect Squares

142  ANS:  2

$\sqrt{32} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$

REF:  060910ia        STA:  A.N.2        TOP:  Simplifying Radicals

143  ANS:  3        REF:  011017ia        STA:  A.G.5        TOP:  Graphing Absolute Value Functions

144  ANS:  4

The transformation is a reflection in the *x*-axis.

REF:  fall0722ia        STA:  A.G.5        TOP:  Graphing Absolute Value Functions

145  ANS:  1

$so = f + 60 \quad j = 2f - 50 \quad se = 3f. \quad f + (f + 60) + (2f - 50) + 3f = 1424$

$$7f + 10 = 1424$$

$$f = 202$$

REF:  060917ia        STA:  A.A.7        TOP:  Writing Linear Systems

146  ANS:  1

$30^2 + 40^2 = c^2$. 30, 40, 50 is a multiple of 3, 4, 5.

$$2500 = c^2$$

$$50 = c$$

REF:  fall0711ia     STA:  A.A.45     TOP:  Pythagorean Theorem

147  ANS:  1

$x = \dfrac{-b}{2a} = \dfrac{-(-16)}{2(1)} = 8.$  $y = (8)^2 - 16(8) + 63 = -1$

REF:  060918ia     STA:  A.A.41     TOP:  Identifying the Vertex of a Quadratic Given Equation

148  ANS:  3     REF:  081008ia     STA:  A.A.19
TOP:  Factoring the Difference of Perfect Squares

149  ANS:  1     REF:  080924ia     STA:  A.G.1     TOP:  Compositions of Polygons and Circles

150  ANS:  2

$$\frac{3}{5}(x+2) = x - 4$$

$$3(x+2) = 5(x-4)$$

$$3x + 6 = 5x - 20$$

$$26 = 2x$$

$$x = 13$$

REF:  080909ia     STA:  A.A.25     TOP:  Solving Equations with Fractional Expressions

151  ANS:  4

$$\frac{\text{distance}}{\text{time}} = \frac{24}{6} = 4$$

REF:  010902ia     STA:  A.M.1     TOP:  Speed

152  ANS:  1

$$\frac{\sqrt{32}}{4} = \frac{\sqrt{16}\sqrt{2}}{4} = \sqrt{2}$$

REF:  060828ia     STA:  A.N.2     TOP:  Simplifying Radicals

153  ANS:  2

The set of integers greater than -2 and less than 6 is $\{-1, 0, 1, 2, 3, 4, 5\}$.  The subset of this set that is the positive factors of 5 is $\{1, 5\}$.  The complement of this subset is $\{-1, 0, 2, 3, 4\}$.

REF:  060818ia     STA:  A.A.30     TOP:  Set Theory

154  ANS:  1

$-|a - b| = -|7 - (-3)| = -|-10| = -10$

REF:  011010ia     STA:  A.N.6     TOP:  Evaluating Expressions

155  ANS: 2

$R = 0.5^{d-1}$

REF: 011006ia       STA: A.A.9        TOP: Exponential Functions

156  ANS: 4

$\dfrac{2^6}{2^1} = 2^5$

REF: 060813ia       STA: A.A.12       TOP: Division of Powers

157  ANS: 3

$\sqrt{72} = \sqrt{36}\sqrt{2} = 6\sqrt{2}$

REF: 010920ia       STA: A.N.2        TOP: Simplifying Radicals

158  ANS: 2

$m = \dfrac{5-2}{3-(-2)} = \dfrac{3}{5}$

REF: 061004ia       STA: A.A.33       TOP: Slope

159  ANS: 2            REF: 080815ia    STA: A.G.1          TOP:  Compositions of Polygons and Circles

160  ANS: 2

$P = 2l + 2w$

$P - 2l = 2w$

$\dfrac{P - 2l}{2} = w$

REF: 010911ia       STA: A.A.23       TOP: Transforming Formulas

161  ANS: 3            REF: 080907ia    STA: A.S.20         TOP:  Theoretical Probability

162  ANS: 2

$\tan 32 = \dfrac{x}{25}$

$x \approx 15.6$

REF: 080914ia       STA: A.A.44       TOP: Using Trigonometry to Find a Side

163  ANS: 3

$\dfrac{x}{3} + \dfrac{x+1}{2} = x$

$\dfrac{2x + 3(x+1)}{6} = x$

$5x + 3 = 6x$

$3 = x$

REF: 061019ia       STA: A.A.25       TOP: Solving Equations with Fractional Expressions

164 ANS: 4
$25(x - 3) = 25x - 75$

REF: 060823ia     STA: A.A.1     TOP: Expressions
165 ANS: 2     REF: 080823ia     STA: A.A.32     TOP: Slope
166 ANS: 3     REF: 061003ia     STA: A.A.13     TOP: Addition and Subtraction of Polynomials
KEY: addition
167 ANS: 2
$m = \dfrac{5-3}{2-7} = -\dfrac{2}{5}$

REF: 010913ia     STA: A.A.33     TOP: Slope
168 ANS: 2     REF: 010925ia     STA: A.A.15     TOP: Undefined Rationals
169 ANS: 2     REF: fall0725ia     STA: A.N.4     TOP: Operations with Scientific Notation
170 ANS: 4
$x^2 - 7x + 6 = 0$

$(x - 6)(x - 1) = 0$

$x = 6 \quad x = 1$

REF: 060902ia     STA: A.A.28     TOP: Roots of Quadratics
171 ANS: 3     REF: 061017ia     STA: A.S.11     TOP: Quartiles and Percentiles
172 ANS: 2
$\left| \dfrac{55.42 - 50.27}{55.42} \right| \approx 0.093$

REF: 081023ia     STA: A.M.3     TOP: Error
173 ANS: 4
$\dfrac{9.2 \times 10^6}{2.3 \times 10^2} = 4 \times 10^4$

REF: 081006ia     STA: A.N.4     TOP: Operations with Scientific Notation
174 ANS: 2
The events are not mutually exclusive: P(prime) $= \dfrac{3}{6}$, P(even) $= \dfrac{3}{6}$, P(prime AND even) $= \dfrac{1}{6}$

P(prime OR even) $= \dfrac{3}{6} + \dfrac{3}{6} - \dfrac{1}{6} = \dfrac{5}{6}$

REF: 080830ia     STA: A.S.23     TOP: Theoretical Probability
KEY: not mutually exclusive events
175 ANS: 4     REF: 080903ia     STA: A.A.12     TOP: Multiplication of Powers
176 ANS: 2
$\tan B = \dfrac{\text{opposite}}{\text{adjacent}} = \dfrac{8}{15} = 0.5\overline{3}$

REF: 081026ia     STA: A.A.42     TOP: Trigonometric Ratios

177  ANS: 4
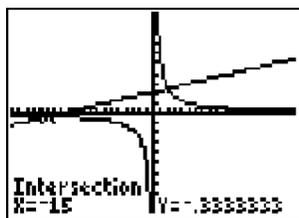


$$\frac{5}{x} = \frac{x+13}{6}$$

$$x^2 + 13x = 30$$

$$x^2 + 13x - 30 = 0$$

$$(x+15)(x-2) = 0$$

$$x = -15 \text{ or } 2$$

REF: 060826ia    STA: A.A.26    TOP: Solving Rationals

178  ANS: 2    REF: 060923ia    STA: A.A.13    TOP: Addition and Subtraction of Polynomials
KEY: subtraction

179  ANS: 1

$$\sin C = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{13}{85}$$

REF: fall0721ia    STA: A.A.42    TOP: Trigonometric Ratios

180  ANS: 1

$$x^2 - 36 = 5x$$

$$x^2 - 5x - 36 = 0$$

$$(x-9)(x+4) = 0$$

$$x = 9$$

REF: 061020ia    STA: A.A.8    TOP: Writing Quadratics

181  ANS: 4    REF: fall0715ia    STA: A.A.5    TOP: Modeling Inequalities

182  ANS: 4    REF: fall0729ia    STA: A.A.2    TOP: Expressions

183  ANS: 2

$$\sin A = \frac{8}{12}$$

$$A \approx 42$$

REF: 060816ia    STA: A.A.43    TOP: Using Trigonometry to Find an Angle

184  ANS: 3    REF: fall0705ia    STA: A.N.1    TOP: Identifying Properties

185  ANS: 4

$$\frac{x^2-1}{x+1} \cdot \frac{x+3}{3x-3} = \frac{(x+1)(x-1)}{x+1} \cdot \frac{x+3}{3(x-1)} = \frac{x+3}{3}$$

REF: 060815ia    STA: A.A.18    TOP: Multiplication and Division of Rationals

186 ANS: 3
$(3-1) \times 2 \times 3 = 12$

REF: 080905ia    STA: A.N.7    TOP: Conditional Probability

187 ANS: 3
$35000(1-0.05)^4 \approx 28507.72$

REF: fall0719ia    STA: A.A.9    TOP: Exponential Functions

188 ANS: 3
$\cos A = \dfrac{\text{adjacent}}{\text{hypotenuse}} = \dfrac{15}{17}$

REF: 011008ia    STA: A.A.42    TOP: Trigonometric Ratios

189 ANS: 2
$\sqrt{5^2 + 7^2} \approx 8.6$

REF: 081004ia    STA: A.A.45    TOP: Pythagorean Theorem

190 ANS: 4
$_8 P_3 = 336$

REF: 061026ia    STA: A.N.8    TOP: Permutations

191 ANS: 4    REF: 061018ia    STA: A.A.12    TOP: Division of Powers

192 ANS: 2



$\dfrac{2x-3}{x-4} = \dfrac{2}{3}$
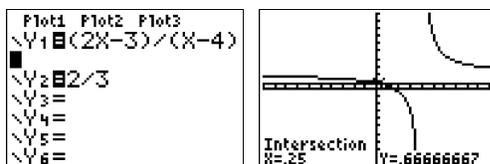
$3(2x-3) = 2(x-4)$

$6x - 9 = 2x - 8$

$4x = 1$

$x = \dfrac{1}{4}$

REF: 081012ia    STA: A.A.26    TOP: Solving Rationals

193 ANS: 2
$A(-3,8) \text{ and } B(3,6). \quad m = \dfrac{8-6}{-3-3} = \dfrac{2}{-6} = -\dfrac{1}{3}$

REF: 081005ia    STA: A.A.33    TOP: Slope

194 ANS: 4    REF: 011016ia    STA: A.A.23    TOP: Transforming Formulas

195 ANS: 2

shaded = whole − unshaded

$$= \text{rectangle-triangle}$$

$$= lw - \frac{1}{2}bh$$

$$= 15 \times 6 - \frac{1}{2} \times 15 \times 4.6$$

$$= 90 - 34.5$$

$$= 55.5$$

REF: 081019ia      STA: A.G.1      TOP: Compositions of Polygons and Circles

196 ANS: 2      REF: 080916ia      STA: A.G.8      TOP: Solving Quadratics by Graphing

197 ANS: 3

$$\frac{(2x^3)(8x^5)}{4x^6} = \frac{16x^8}{4x^6} = 4x^2$$

REF: fall0703ia      STA: A.A.12      TOP: Division of Powers

198 ANS: 2      REF: 060904ia      STA: A.A.1      TOP: Expressions

199 ANS: 2

The volume of the cube using Ezra's measurements is 8 ($2^3$). The actual volume is 9.261 ($2.1^3$). The relative error is $\left| \frac{9.261 - 8}{9.261} \right| \approx 0.14.$

REF: 060928ia      STA: A.M.3      TOP: Error

200 ANS: 3

$$F = \frac{9}{5}C + 32 = \frac{9}{5}(15) + 32 = 59$$

REF: 010901ia      STA: A.M.2      TOP: Conversions

201 ANS: 2

$$\tan A = \frac{\text{opposite}}{\text{adjacent}} = \frac{14}{48}$$

REF: 061009ia      STA: A.A.42      TOP: Trigonometric Ratios

202 ANS: 3

$$P(S) \cdot P(M) = P(S \text{ and } M)$$

$$\frac{3}{5} \cdot P(M) = \frac{3}{10}$$

$$P(M) = \frac{1}{2}$$

REF: 081024ia      STA: A.S.23      TOP: Theoretical Probability

KEY: independent events

203 ANS: 3          REF: 060817ia     STA: A.A.15      TOP: Undefined Rationals

204 ANS: 3

$b = 42 - r \quad r = 2b + 3$

$r = 2b + 3 \quad r = 2(42 - r) + 3$

$\qquad\qquad\quad r = 84 - 2r + 3$

$\qquad\qquad\quad 3r = 87$

$\qquad\qquad\quad r = 29$

REF: 060812ia     STA: A.A.7       TOP: Writing Linear Systems

205 ANS: 3

$x^2 - 6x = 0$

$x(x - 6) = 0$

$x = 0 \ x = 6$

REF: 080921ia     STA: A.A.27      TOP: Solving Quadratics by Factoring

206 ANS: 1
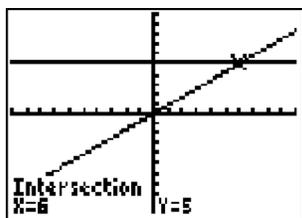


$\dfrac{(2x \times 6) + (3 \times x)}{3 \times 6} = 5$

$\dfrac{12x + 3x}{18} = 5$

$15x = 90$

$x = 6$

REF: 060907ia     STA: A.A.25      TOP: Solving Equations with Fractional Expressions

207 ANS: 1          REF: 080803ia     STA: A.A.4       TOP: Modeling Inequalities

208 ANS: 3

$x = \dfrac{-b}{2a} = \dfrac{-10}{2(-1)} = 5.$

REF: 081018ia     STA: A.A.41     TOP: Identifying the Vertex of a Quadratic Given Equation

209 ANS: 2          REF: 011005ia     STA: A.A.5       TOP: Modeling Inequalities

210 ANS: 3          REF: 081001ia     STA: A.S.7       TOP: Scatter Plots

211 ANS: 2

$\dfrac{6}{4a} - \dfrac{2}{3a} = \dfrac{18a - 8a}{12a^2} = \dfrac{10a}{12a^2} = \dfrac{5}{6a}$

REF: 060929ia     STA: A.A.17     TOP: Addition and Subtraction of Rationals

212 ANS: 2          REF: 060830ia     STA: A.A.9       TOP: Exponential Functions

213 ANS: 2
Candidate *B* received 45%. $45\% \times 1860 = 837$

REF: 081007ia     STA: A.N.5     TOP: Percents

214 ANS: 1
$_4P_4 = 4 \times 3 \times 2 \times 1 = 24$

REF: 080816ia     STA: A.N.8     TOP: Permutations

215 ANS: 3     REF: 060825ia     STA: A.A.45     TOP: Pythagorean Theorem

216 ANS: 4
$SA = 2lw + 2hw + 2lh = 2(3)(1.5) + 2(2)(1.5) + 2(3)(2) = 27$

REF: 060827ia     STA: A.G.2     TOP: Surface Area

217 ANS: 2
$2(x - 3y = -3)$

$2x + y = 8$

$2x - 6y = -6$

$7y = 14$

$y = 2$

REF: 081021ia     STA: A.A.10     TOP: Solving Linear Systems

218 ANS: 3     REF: 060926ia     STA: A.N.1     TOP: Properties of Reals

219 ANS: 2     REF: 060908ia     STA: A.S.21     TOP: Empirical Probability

**Integrated Algebra Multiple Choice Regents Exam Questions**
**Answer Section**

220  ANS:  1
A rooster crows before sunrise, not because of the sun.

REF:  fall0707ia      STA:  A.S.14      TOP:  Analysis of Data

221  ANS:  2
The two values are shoe size and height.

REF:  fall0714ia      STA:  A.S.2      TOP:  Analysis of Data

222  ANS:  1
$-2x + 5 > 17$

$-2x > 12$

$x < -6$

REF:  fall0724ia      STA:  A.A.21      TOP:  Interpreting Solutions

223  ANS:  4      REF:  fall0730ia      STA:  A.G.3      TOP:  Defining Functions

224  ANS:  1      REF:  060801ia      STA:  A.G.4      TOP:  Families of Functions

225  ANS:  4
$P(G \text{ or } W) = \frac{4}{8}$, $P(G \text{ or } B) = \frac{3}{8}$, $P(Y \text{ or } B) = \frac{4}{8}$, $P(Y \text{ or } G) = \frac{5}{8}$

REF:  060802ia      STA:  A.S.22      TOP:  Theoretical Probability

226  ANS:  1
To determine student interest, survey the widest range of students.

REF:  060803ia      STA:  A.S.3      TOP:  Analysis of Data

227  ANS:  4      REF:  060805ia      STA:  A.S.12      TOP:  Scatter Plots

228  ANS:  4
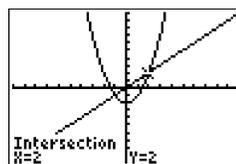


$x^2 - 2 = x$      Since $y = x$, the solutions are $(2,2)$ and $(-1,-1)$.

$x^2 - x - 2 = 0$

$(x - 2)(x + 1) = 0$

$x = 2 \text{ or } -1$

REF:  060810ia      STA:  A.A.11      TOP:  Quadratic-Linear Systems

229  ANS:  1
The slope of both is –4.

REF:  060814ia      STA:  A.A.38      TOP:  Parallel and Perpendicular Lines

230 ANS: 3
The other situations are quantitative.

REF: 060819ia      STA: A.S.1        TOP: Analysis of Data

231 ANS: 3
mean = 6, median = 6 and mode = 7

REF: 080804ia      STA: A.S.4        TOP: Central Tendency

232 ANS: 1        REF: 010905ia     STA: A.G.4        TOP: Families of Functions

233 ANS: 4        REF: 080825ia     STA: A.A.40       TOP: Systems of Linear Inequalities

234 ANS: 4

$$P(O) = \frac{3}{6}, \; P(E) = \frac{3}{6}, \; P(< 6) = \frac{5}{6}, \; P(> 4) = \frac{2}{6}$$

REF: 010903ia      STA: A.S.22       TOP: Theoretical Probability

235 ANS: 3        REF: 010917ia     STA: A.A.29       TOP: Set Theory

236 ANS: 1
Everyone eats, can shop in malls and wear clothes. People who work in a sporting goods store probably watch more sports television than most.

REF: 010923ia      STA: A.S.3        TOP: Analysis of Data

237 ANS: 1

The slope of $y = 3 - 2x$ is –2. Using $m = -\frac{A}{B}$, the slope of $4x + 2y = 5$ is $-\frac{4}{2} = -2$.

REF: 010926ia      STA: A.A.38       TOP: Parallel and Perpendicular Lines

238 ANS: 4        REF: 010929ia     STA: A.S.6        TOP: Box-and-Whisker Plots

239 ANS: 4        REF: 010930ia     STA: A.G.3        TOP: Defining Functions

240 ANS: 3
The other situations are quantitative.

REF: 060905ia      STA: A.S.1        TOP: Analysis of Data

241 ANS: 1

$\frac{4}{3}x + 5 < 17$

$\quad \frac{4}{3}x < 12$

$\quad 4x < 36$

$\quad\quad x < 9$

REF: 060914ia      STA: A.A.21       TOP: Interpreting Solutions

242 ANS: 3        REF: 060919ia     STA: A.G.3        TOP: Defining Functions

243 ANS: 1        REF: 060920ia     STA: A.G.6        TOP: Linear Inequalities

244 ANS: 4        REF: 060930ia     STA: A.A.29       TOP: Set Theory

245  ANS:  3
The number of correct answers on a test causes the test score.

REF:  080908ia        STA:  A.S.13          TOP:  Analysis of Data

246  ANS:  4
Surveying persons leaving a football game about a sports budget contains the most bias.

REF:  080910ia        STA:  A.S.3          TOP:  Analysis of Data

247  ANS:  1          REF:  080911ia        STA:  A.A.36        TOP:  Parallel and Perpendicular Lines

248  ANS:  4
$-2(x-5) < 4$

$-2x + 10 < 4$

$-2x < -6$

$x > 3$

REF:  080913ia        STA:  A.A.21          TOP:  Interpreting Solutions

249  ANS:  3
An element of the domain, 1, is paired with two different elements of the range, 3 and 7.

REF:  080919ia        STA:  A.G.3          TOP:  Defining Functions

250  ANS:  3          REF:  080925ia        STA:  A.G.4        TOP:  Identifying the Equation of a Graph

251  ANS:  3
Frequency is not a variable.

REF:  011014ia        STA:  A.S.2          TOP:  Analysis of Data

252  ANS:  4
In (4), each element in the domain corresponds to a unique element in the range.

REF:  011018ia        STA:  A.G.3          TOP:  Defining Functions

253  ANS:  2          REF:  011019ia        STA:  A.S.12        TOP:  Scatter Plots

254  ANS:  1
$4y - 2x = 0$

$4(-1) - 2(-2) = 0$

$-4 + 4 = 0$

REF:  011021ia        STA:  A.A.39          TOP:  Identifying Points on a Line

255  ANS:  2          REF:  011022ia        STA:  A.A.19
TOP:  Factoring the Difference of Perfect Squares

256  ANS:  2          REF:  011023ia        STA:  A.A.40          TOP:  Systems of Linear Inequalities

257  ANS:  1
The slope of $2x - 4y = 16$ is $\dfrac{-A}{B} = \dfrac{-2}{-4} = \dfrac{1}{2}$

REF:  011026ia        STA:  A.A.38          TOP:  Parallel and Perpendicular Lines

258  ANS:  2          REF:  011027ia        STA:  A.A.3          TOP:  Expressions

259 ANS: 3
The age of a child does not cause the number of siblings he has, or vice versa.

    REF: 011030ia    STA: A.S.14    TOP: Analysis of Data

260 ANS: 3
2(1)+3=5

    REF: 061007ia    STA: A.A.39    TOP: Linear Equations

261 ANS: 1    REF: 061010ia    STA: A.A.40    TOP: Systems of Linear Inequalities

262 ANS: 3    REF: 061011ia    STA: A.S.2    TOP: Analysis of Data

263 ANS: 4    REF: 061013ia    STA: A.G.3    TOP: Defining Functions

264 ANS: 4    REF: 061022ia    STA: A.S.3    TOP: Analysis of Data

265 ANS: 2    REF: 081014ia    STA: A.A.36    TOP: Parallel and Perpendicular Lines

266 ANS: 4

$$2x - 3y = 9$$

$$2(0) - 3(-3) = 9$$

$$0 + 9 = 9$$

    REF: 081016ia    STA: A.A.39    TOP: Identifying Points on a Line

267 ANS: 3    REF: 081017a    STA: A.S.14    TOP: Analysis of Data

268 ANS: 4    REF: 081022ia    STA: A.A.29    TOP: Set Theory

269 ANS: 1    REF: 081030ia    STA: A.A.3    TOP: Expressions

270 ANS: 4    REF: 081025ia    STA: A.G.4    TOP: Families of Functions

# Integrated Algebra 2 Point Regents Exam Questions
# Answer Section

271 ANS:

$\frac{1}{8}$. After the English and social studies books are taken, 8 books are left and 1 is an English book.

PTS: 2          REF: 060933ia          STA: A.S.18          TOP: Conditional Probability

272 ANS:

$3a^2b^2 - 6a$   $\frac{45a^4b^3 - 90a^3b}{15a^2b} = \frac{45a^4b^3}{15a^2b} - \frac{90a^3b}{15a^2b} = 3a^2b^2 - 6a$

PTS: 2          REF: 081031ia          STA: A.A.14          TOP: Rational Expressions

273 ANS:

$36 - 9\pi$. 15.6. Area of square–area of 4 quarter circles. $(3+3)^2 - 3^2\pi = 36 - 9\pi$

PTS: 2          REF: 060832ia          STA: A.G.1          TOP: Compositions of Polygons and Circles

274 ANS:

$30\sqrt{2}$. $5\sqrt{72} = 5\sqrt{36}\sqrt{2} = 30\sqrt{2}$

PTS: 2          REF: fall0731ia          STA: A.N.2          TOP: Simplifying Radicals

275 ANS:

$\frac{3}{8}$. (H,H,H), (H,H,T), (H,T,H), **(H,T,T)**, (T,H,H), **(T,H,T)**, **(T,T,H)**, (T,T,T)

PTS: 2          REF: 080933ia          STA: A.S.19          TOP: Sample Space

276 ANS:

{1,2,4,5,9,10,12}

PTS: 2          REF: 080833ia          STA: A.A.30          TOP: Set Theory

277 ANS:

$\frac{3k^2m^6}{4}$

PTS: 2          REF: 010932ia          STA: A.A.12          TOP: Division of Powers

278 ANS:

$\sin x = \frac{30}{50}$

$x = \sin^{-1}\frac{3}{5}$

$x \approx 37$

PTS: 2          REF: 061033ia          STA: A.A.43          TOP: Using Trigonometry to Find an Angle

279  ANS:

111.25.  $\dfrac{\text{distance}}{\text{time}} = \dfrac{89}{0.8} = 111.25$

PTS: 2          REF: 080831ia     STA: A.M.1      TOP: Speed

280  ANS:

16.  12 feet equals 4 yards.  $4 \times 4 = 16$.

PTS: 2          REF: 011031ia     STA: A.M.2      TOP: Conversions

281  ANS:

$-3\sqrt{48} = -3\sqrt{16}\sqrt{3} = -12\sqrt{3}$

PTS: 2          REF: 081033ia     STA: A.N.2      TOP: Simplifying Radicals

282  ANS:

5,112.  $(12 \times 30 \times 16) - (6 \times 12 \times 9) = 5112$

PTS: 2          REF: 080932ia     STA: A.G.2      TOP: Volume

283  ANS:

$-6a + 42$.  distributive

PTS: 2          REF: 061032ia     STA: A.N.1      TOP: Properties of Reals

284  ANS:

$d = 6.25h$, 250.  $d = 6.25(40) = 250$

PTS: 2          REF: 010933ia     STA: A.N.5      TOP: Direct Variation

285  ANS:

Not all of the homework problems are equations.  The first problem is an expression.

PTS: 2          REF: 080931ia     STA: A.A.3      TOP: Expressions

286  ANS:

50.  $12 + 10 + 12 + \dfrac{1}{2}(10\pi) \approx 50$

PTS: 2          REF: 010931ia     STA: A.G.1      TOP: Compositions of Polygons and Circles

287  ANS:

orchestra: $\dfrac{3}{26} > \dfrac{4}{36}$

PTS: 2          REF: 011033ia     STA: A.S.22     TOP: Theoretical Probability

288  ANS:

60.  $_5P_3 = 60$

PTS: 2          REF: 060931ia     STA: A.N.8      TOP: Permutations

289 ANS:
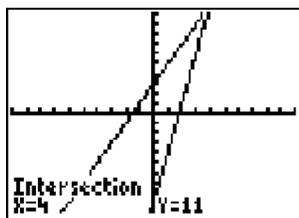


4. $3 + 2g = 5g - 9$

$12 = 3g$

$g = 4$

PTS: 2            REF: fall0732ia      STA: A.A.22      TOP: Solving Equations

290 ANS:

$4x(x + 3)(x - 3)$. $4x^3 - 36x = 4x(x^2 - 9) = 4x(x + 3)(x - 3)$

PTS: 2            REF: 060932ia      STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

291 ANS:

$\frac{3}{8}$. $P(s_1 < 4) \times P(s_2 = \text{back}) = \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$

PTS: 2            REF: 080832ia      STA: A.S.23      TOP: Theoretical Probability

KEY: independent events

292 ANS:

Ann's. $\frac{225}{15} = 15$ mpg is greater than $\frac{290}{23.2} = 12.5$ mpg

PTS: 2            REF: 060831ia      STA: A.M.1      TOP: Using Rate

293 ANS:

$0 \le t \le 40$

PTS: 2            REF: 060833ia      STA: A.A.31      TOP: Set Theory

294 ANS:

$\frac{600 - 592}{592} \approx 0.014$

PTS: 2            REF: 061031ia      STA: A.M.3      TOP: Relative Error

295 ANS:

53. $\sin A = \frac{16}{20}$

$A \approx 53$

PTS: 2            REF: 011032ia      STA: A.A.43      TOP: Using Trigonometry to Find an Angle

296  ANS:

2,160   $\dfrac{1,200}{25} = \dfrac{x}{45}$

$25x = 54,000$

$x = 2,160$

PTS: 2          REF: 081032ia        STA: A.M.1          TOP: Using Rate

297  ANS:

33.4. Serena needs 24 $(9+6+9)$ feet of fencing to surround the rectangular portion of the garden. The length of the fencing needed for the semicircular portion of the garden is $\dfrac{1}{2}\pi d = 3\pi \approx 9.4$ feet.

PTS: 2          REF: fall0733ia        STA: A.G.1          TOP: Compositions of Polygons and Circles

# Integrated Algebra 3 Point Regents Exam Questions
# Answer Section

298 ANS:

7. $15x + 22 \geq 120$

$x \geq 6.5\overline{3}$

PTS: 3      REF: fall0735ia      STA: A.A.6      TOP: Modeling Inequalities

299 ANS:

81.3, 80, both increase

PTS: 3      REF: 011035ia      STA: A.S.16      TOP: Central Tendency

300 ANS:

1,512, 1,551.25, 0.025. $36 \times 42 = 1512$. $36.5 \times 42.5 = 1551.25$. $RE = \left| \dfrac{1512 - 1551.25}{1551.25} \right| \approx 0.025$.

PTS: 3      REF: 010934ia      STA: A.M.3      TOP: Error

301 ANS:

$\dfrac{3}{4x - 8} \cdot \dfrac{3x + 6}{4x + 12} \div \dfrac{x^2 - 4}{x + 3} = \dfrac{3(x + 2)}{4(x + 3)} \cdot \dfrac{x + 3}{(x + 2)(x - 2)} = \dfrac{3}{4(x - 2)}$

PTS: 3      REF: 010935ia      STA: A.A.18      TOP: Multiplication and Division of Rationals

302 ANS:

80, 136 $V = lwh = 10 \cdot 2 \cdot 4 = 80$ $SA = 2lw + 2hw + 2lh = 2 \cdot 10 \cdot 2 + 2 \cdot 4 \cdot 2 + 2 \cdot 10 \cdot 4 = 136$

PTS: 3      REF: 081035ia      STA: A.G.2      TOP: Surface Area

303 ANS:

0.102. $\dfrac{(5.3 \times 8.2 \times 4.1) - (5 \times 8 \times 4)}{5.3 \times 8.2 \times 4.1} = \dfrac{178.16 - 160}{178.16} = 0.102$

PTS: 3      REF: 011036ia      STA: A.M.3      TOP: Error

304 ANS:

$\dfrac{38}{\pi}$, 2. $V = \pi r^2 h$ $\dfrac{36}{\left(\dfrac{38}{\pi}\right)} \approx 2.97$. Three cans will not fit. The maximum number is 2.

$342 = \pi \left(\dfrac{6}{2}\right)^2 h$

$\dfrac{342}{9\pi} = h$

$\dfrac{38}{\pi} = h$

PTS: 3      REF: 010936ia      STA: A.G.2      TOP: Volume

305 ANS:

–2, 3.
$$x^2 - x = 6$$
$$x^2 - x - 6 = 0$$
$$(x - 3)(x + 2) = 0$$
$$x = 3 \text{ or } -2$$

PTS: 3　　　REF: 011034ia　　　STA: A.A.28　　　TOP: Roots of Quadratics

306 ANS:

–12.
$$3\left(\frac{2}{3}x + 3 < -2x - 7\right)$$
$$x + 9 < -6x - 21$$
$$7x < -30$$
$$x < \frac{-30}{7}$$

PTS: 3　　　REF: 061034ia　　　STA: A.A.21　　　TOP: Interpreting Solutions

307 ANS:

Greg's rate of 5.5 is faster than Dave's rate of 5.3. $\dfrac{\text{distance}}{\text{time}} = \dfrac{11}{2} = 5.5.$ $\dfrac{16}{3} = 5.\overline{3}$

PTS: 3　　　REF: 080936ia　　　STA: A.M.1　　　TOP: Speed

308 ANS:

(S,S), (S,K), **(S,D)**, (K,S), (K,K), **(K,D)**, **(D,S)**, **(D,K)**, (D,D), $\dfrac{4}{9}$

PTS: 3　　　REF: fall0736ia　　　STA: A.S.19　　　TOP: Sample Space

309 ANS:

$10 + 2d \geq 75$, 33. $10 + 2d \geq 75$
$$d \geq 32.5$$

PTS: 3　　　REF: 060834ia　　　STA: A.A.6　　　TOP: Modeling Inequalities

310 ANS:



Donut Pit Profits
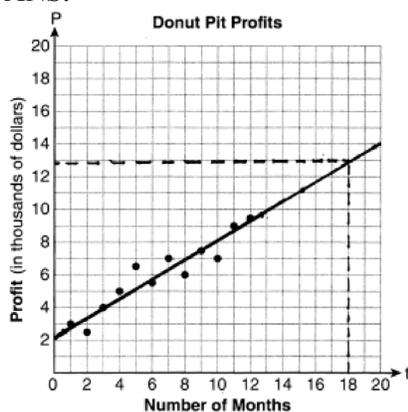
They will not reach their goal in 18 months.

PTS: 3    REF: 061036ia    STA: A.S.17    TOP: Scatter Plots

311 ANS:
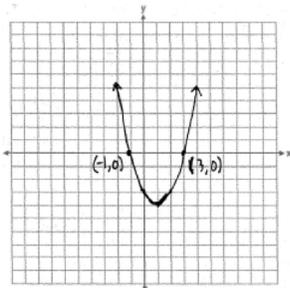


PTS: 3    REF: 060836ia    STA: A.G.8    TOP: Solving Quadratics by Graphing

312 ANS:

50, 1.5, 10. $\dfrac{\text{distance}}{\text{time}} = \dfrac{60}{1.2} = 50.$ $\dfrac{\text{distance}}{\text{time}} = \dfrac{60}{40} = 1.5.$ $\text{speed} \times \text{time} = 55 \times 2 = 110.$ $120 - 110 = 10$

PTS: 3    REF: fall0734ia    STA: A.M.1    TOP: Speed

313 ANS:

minimum is 120, 1st quartile is 145, median is 292, 3rd quartile is 407, and maximum is 452
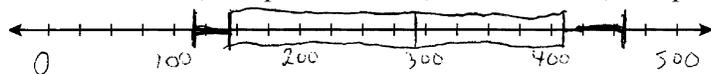


PTS: 3    REF: 081034ia    STA: A.S.5    TOP: Box-and-Whisker Plots

314 ANS:

30.4%; no, 23.3%. $\dfrac{7.50 - 5.75}{5.75} = 30.4\%.$ $\dfrac{7.50 - 5.75}{7.50} = 23.3\%$

PTS: 3    REF: 080935ia    STA: A.N.5    TOP: Percents

315 ANS:

$60 - 42\sqrt{5}.$ $3\sqrt{20}(2\sqrt{5} - 7) = 6\sqrt{100} - 21\sqrt{20} = 60 - 21\sqrt{4}\sqrt{5} = 60 - 42\sqrt{5}$

PTS: 3    REF: 080834ia    STA: A.N.3    TOP: Operations with Radicals
KEY: multiplication

3

316 ANS:

$y = \dfrac{2}{5}x + 2.$  $m = \dfrac{4-0}{5-(-5)} = \dfrac{2}{5}.$  $y = mx + b$ .

$$4 = \dfrac{2}{5}(5) + b$$
$$b = 2$$

PTS: 3          REF: 080836ia          STA: A.A.35          TOP: Writing Linear Equations

317 ANS:
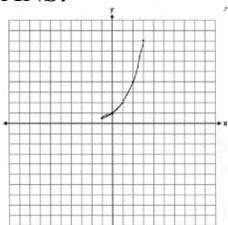


. The graph will never intersect the $x$-axis as $2^x > 0$ for all values of $x$.

PTS: 3          REF: 080835ia          STA: A.G.4          TOP: Graphing Exponential Functions

318 ANS:
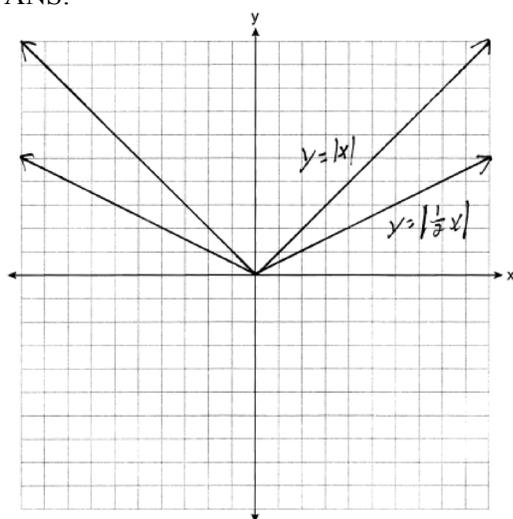


. Graph becomes wider as the coefficient approaches 0.

PTS: 3          REF: 061035ia          STA: A.G.5          TOP: Graphing Absolute Value Functions

319 ANS:

$-15, 2$   $x^2 + 13x - 30 = 0$
$$(x + 15)(x - 2) = 0$$
$$x = -15, 2$$

PTS: 3          REF: 081036ia          STA: A.A.28          TOP: Roots of Quadratics

4

320 ANS:

$$x = \frac{-b}{2a} = \frac{-(-8)}{2(-2)} = -2$$

(−2, 11).

$$y = -2(-2)^2 - 8(-2) + 3 = 11$$

PTS: 3 REF: 080934ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

321 ANS:

56. If the circumference of circle $O$ is $16\delta$ inches, the diameter, $\overline{AD}$, is 16 inches and the length of $\overline{BC}$ is 12 inches $\frac{3}{4} \times 16$. The area of trapezoid $ABCD$ is $\frac{1}{2} \times 4(12 + 16) = 56$.

PTS: 3 REF: 060934ia STA: A.G.1 TOP: Compositions of Polygons and Circles

322 ANS:

$\frac{1}{6}$, 16.67%, \$13.50. $\frac{18 - 15}{18} = \frac{1}{6}$. $18 \times 0.75 = 13.5$

PTS: 3 REF: 060835ia STA: A.N.5 TOP: Percents

323 ANS:
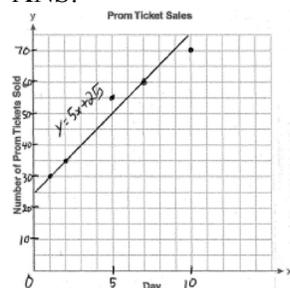


PTS: 3 REF: 060936ia STA: A.S.8 TOP: Scatter Plots

324 ANS:

5,583.86. $A = P(1 + R)^t = 5000(1 + 0.0375)^3 \approx 5583.86$

PTS: 3 REF: 060935ia STA: A.A.9 TOP: Exponential Functions

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

325 ANS:
(H,F,M), (H,F,J), (H,F,S), (H,A,M), (H,A,J), (H,A,S), (C,F,M), (C,F,J), (C,F,S), (C,A,M), (C,A,J), (C,A,S), (T,F,M), (T,F,J), (T,F,S), (T,A,M), (T,A,J), (T,A,S). There are 18 different kids' meals, 12 do not include juice and 6 include chicken nuggets.

PTS: 4      REF: 010939ia      STA: A.S.19      TOP: Sample Space

326 ANS:

$$\frac{x-7}{3x} \cdot \frac{2x^2-8x-42}{6x^2} \div \frac{x^2-9}{x^2-3x} = \frac{2(x^2-4x-21)}{6x^2} \cdot \frac{x(x-3)}{(x+3)(x-3)} = \frac{(x-7)(x+3)}{3x} \cdot \frac{1}{x+3} = \frac{x-7}{3x}$$

PTS: 4      REF: 080937ia      STA: A.A.18      TOP: Multiplication and Division of Rationals

327 ANS:



6,–2.   $\dfrac{x+1}{x} = \dfrac{-7}{x-12}$

$(x+1)(x-12) = -7x$

$x^2 - 11x - 12 = -7x$

$x^2 - 4x - 12 = 0$

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

$x = 6 \text{ or } -2$
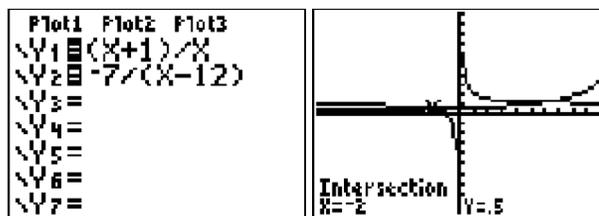
PTS: 4      REF: fall0739ia      STA: A.A.26      TOP: Solving Rationals

328 ANS:
(–2,5).   $3x + 2y = 4$   $12x + 8y = 16.$   $3x + 2y = 4$

$4x + 3y = 7$   $12x + 9y = 21$   $3x + 2(5) = 4$

$y = 5$      $3x = -6$

$x = -2$

PTS: 4      REF: 010937ia      STA: A.A.10      TOP: Solving Linear Systems

329 ANS:
30, 20, 71-80, 81-90 and 91-100

PTS: 4      REF: 061038ia      STA: A.S.9
TOP: Frequency Histograms, Bar Graphs and Tables

330 ANS:
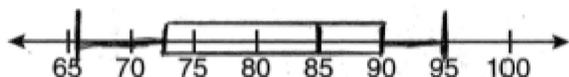


PTS: 4 REF: 080939ia STA: A.S.5 TOP: Box-and-Whisker Plots

331 ANS:

$84, 71$ $\sin 50 = \dfrac{x}{110}$ $\cos 50 = \dfrac{y}{110}$

$\qquad x \approx 84 \qquad y \approx 71$

PTS: 4 REF: 081039ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

332 ANS:

$15{,}600{,}000, 4{,}368{,}000.$ $10 \times 10 \times 10 \times 26 \times 25 \times 24 = 15{,}600{,}000.$ $10 \times 9 \times 8 \times 26 \times 25 \times 24 = 11{,}232{,}000.$
$15{,}600{,}000 - 11{,}232{,}000 = 4{,}368{,}000.$

PTS: 4 REF: 011037ia STA: A.N.8 TOP: Permutations

333 ANS:

$w(w + 15) = 54, 3, 18.$ $\qquad w(w + 15) = 54$

$$w^2 + 15w - 54 = 0$$
$$(w + 18)(w - 3) = 0$$
$$w = 3$$

PTS: 4 REF: 060837ia STA: A.A.8 TOP: Geometric Applications of Quadratics

334 ANS:

$39, 63.$ $\tan 52 = \dfrac{50}{x}.$ $\sin 52 = \dfrac{50}{x}$

$\qquad x \approx 39 \qquad x \approx 63$

PTS: 4 REF: 060937ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

335 ANS:

$618.45, 613.44, 0.008.$ $21.7 \times 28.5 = 618.45.$ $21.6 \times 28.4 = 613.44.$ $\left| \dfrac{618.45 - 613.44}{613.44} \right| \approx 0.008.$ An error of less

than 1% would seem to be insignificant.

PTS: 4 REF: 060838ia STA: A.M.3 TOP: Error

336 ANS:

$\dfrac{x^2 + 9x + 14}{x^2 - 49} \div \dfrac{3x + 6}{x^2 + x - 56} = \dfrac{(x + 7)(x + 2)}{(x + 7)(x - 7)} \cdot \dfrac{(x + 8)(x - 7)}{3(x + 2)} = \dfrac{x + 8}{3}$

PTS: 4 REF: 061037ia STA: A.A.18 TOP: Multiplication and Division of Rationals

2

337 ANS:

6, 8, 10. Three consecutive even integers are $x$, $x+2$ and $x+4$. $(x+2)(x+4) = 10x+20$

$$x^2 + 6x + 8 = 10x + 20$$

$$x^2 - 4x - 12 = 0$$

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

$$x = 6$$

PTS: 4 REF: 011039ia STA: A.A.8 TOP: Writing Quadratics

338 ANS:

$m = 50¢$, $p = 15¢$. $3m+2p = 1.80$. $9m+6p = 5.40$ . $4(.50)+6p = 2.90$

$$4m+6p = 2.90 \quad 4m+6p = 2.90 \qquad 6p = .90$$

$$5m = 2.50 \qquad\qquad p = \$0.15$$

$$m = \$0.50$$

PTS: 3 REF: 080837ia STA: A.A.7 TOP: Writing Linear Systems

339 ANS:



$(10, -10)$
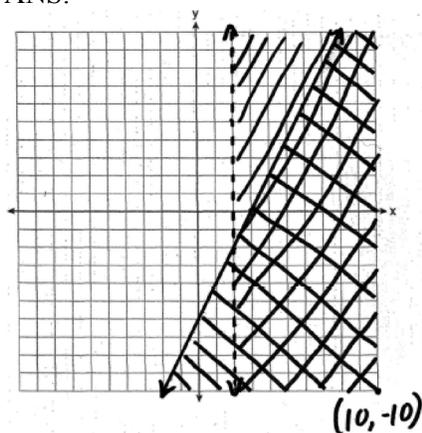
PTS: 4 REF: 010938ia STA: A.G.7 TOP: Systems of Linear Inequalities

340 ANS:
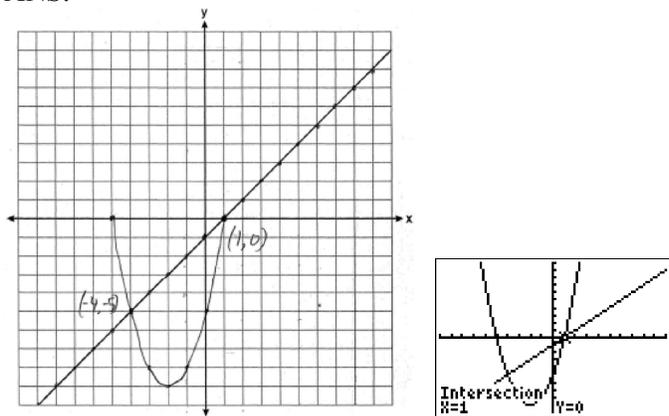


PTS: 4          REF: 080839ia          STA: A.G.9          TOP: Quadratic-Linear Systems

341 ANS:

**Number of Days Outside**

| Interval | Tally | Frequency |
| --- | --- | --- |
| 0–1 | III | 3 |
| 2–3 | HHT II | 7 |
| 4–5 | HHT II | 7 |
| 6–7 | III | 3 |

**Number of Days Outside**

| Interval | Cumulative Frequency |
| --- | --- |
| 0–1 | 3 |
| 0–3 | 10 |
| 0–5 | 17 |
| 0–7 | 20 |
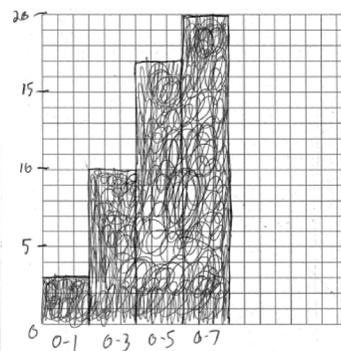


PTS: 4          REF: 080838ia          STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables

342 ANS:
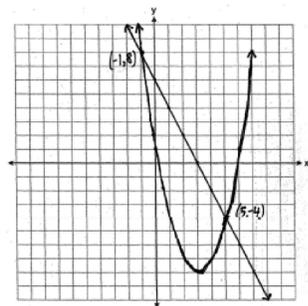


PTS: 4          REF: 060939ia          STA: A.G.9          TOP: Quadratic-Linear Systems

343 ANS:
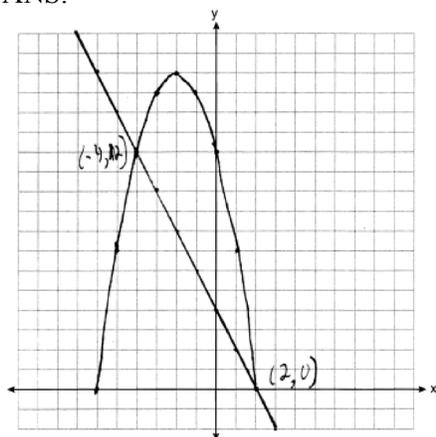


PTS: 4 REF: 061039ia STA: A.G.9 TOP: Quadratic-Linear Systems

344 ANS:
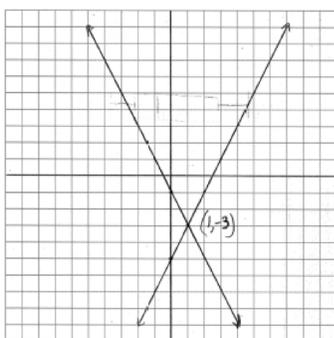


PTS: 4 REF: 080938ia STA: A.G.7 TOP: Solving Linear Systems

345 ANS:



| Interval | Tally | Frequency |
|----------|-------|-----------|
| 40–44 | IIII | 4 |
| 45–49 | IIII | 5 |
| 50–54 | IIII | 4 |
| 55–59 | IIII III | 8 |
| 60–64 | IIII II | 7 |
| 65–69 | II | 2 |
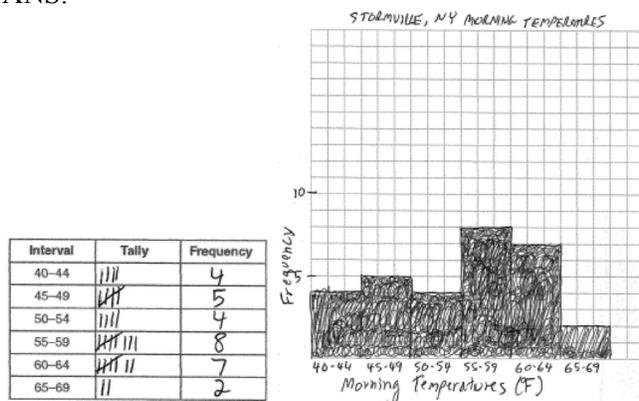
PTS: 4 REF: 060938ia STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables

346   ANS:
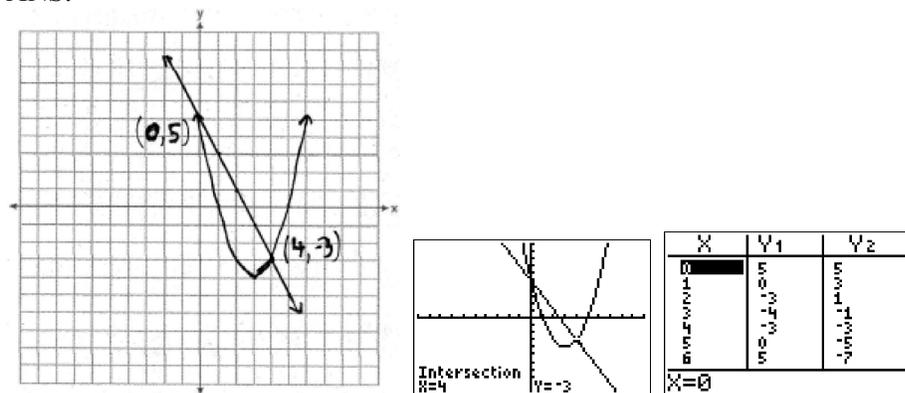


PTS:  4              REF:  fall0738ia       STA:  A.G.9              TOP:  Quadratic-Linear Systems
347   ANS:
225000, 175000, the median better represents the value since it is closer to more values than the mean.

PTS:  4              REF:  fall0737ia       STA:  A.S.4
TOP:  Frequency Histograms, Bar Graphs and Tables
348   ANS:
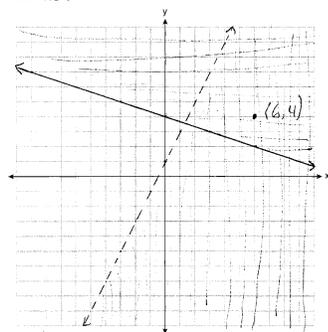


PTS:  4              REF:  081037ia        STA:  A.G.7              TOP:  Systems of Linear Inequalities
349   ANS:
315,000, 180,000, the median better represents value since it is closer to more prices than the mean.

PTS:  4              REF:  060839ia        STA:  A.S.4
TOP:  Frequency Histograms, Bar Graphs and Tables
350   ANS:
Hat *A*, add 1 not green to Hat *A*, add 11 green to Hat *B*, and add none to Hat *C*.

PTS:  4              REF:  081038ia        STA:  A.S.22             TOP:  Theoretical Probability

351  ANS:
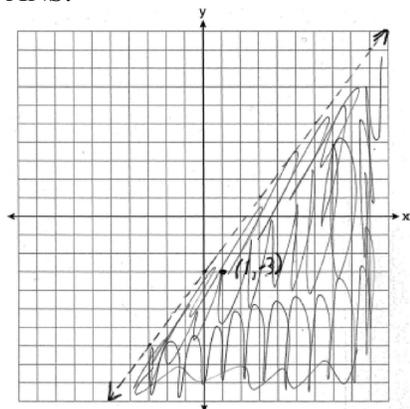


(1,−3) is in the solution set. $4(1) − 3(−3) > 9$

$$4 + 9 > 9$$

PTS:  4        REF:  011038ia       STA:  A.G.6       TOP:  Linear Inequalities