JEFFERSON MATH PROJECT
REGENTS AT RANDOM

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 Regents at Random
Answer Section

1 ANS: 1
$30^2 + 40^2 = c^2$. 30, 40, 50 is a multiple of 3, 4, 5.

$$2500 = c^2$$

$$50 = c$$

PTS: 2   REF: fall0711ia   STA: A.A.45   TOP: Pythagorean Theorem
2 ANS: 2   PTS: 2   REF: 011023ia   STA: A.A.40
TOP: Systems of Linear Inequalities
3 ANS: 3
$3ax + b = c$

$$3ax = c - b$$

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

PTS: 2   REF: 080808ia   STA: A.A.23   TOP: Transforming Formulas
4 ANS: 3
The value of the third quartile is the last vertical line of the box.

PTS: 2   REF: 080818ia   STA: A.S.6   TOP: Box-and-Whisker Plots
5 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
6 ANS: 4
$6\sqrt{50} + 6\sqrt{2} = 6\sqrt{25}\sqrt{2} + 6\sqrt{2} = 30\sqrt{2} + 6\sqrt{2} = 36\sqrt{2}$

PTS: 2   REF: 011024ia   STA: A.N.3   TOP: Operations with Radicals
KEY: addition
7 ANS: 4
$16^2 + b^2 = 34^2$

$$b^2 = 900$$

$$b = 30$$

PTS: 2   REF: 080809ia   STA: A.A.45   TOP: Pythagorean Theorem
8 ANS: 1   PTS: 2   REF: 080824ia   STA: A.A.43
TOP: Using Trigonometry to Find an Angle

9   ANS: 3
The other situations are quantitative.

PTS: 2   REF: 060905ia   STA: A.S.1   TOP: Analysis of Data

10   ANS: 4

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

PTS: 2   REF: fall0727ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

11   ANS: 2

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

$2x + y = 8$

$2x - 6y = -6$

$ 7y = 14$

$ y = 2$

PTS: 2   REF: 081021ia   STA: A.A.10   TOP: Solving Linear Systems

12   ANS: 3

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

PTS: 2   REF: fall0716ia   STA: A.A.33   TOP: Slope

13   ANS: 3

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

PTS: 2   REF: fall0703ia   STA: A.A.12   TOP: Division of Powers

14   ANS: 3   PTS: 2   REF: 081009ia   STA: A.A.30
TOP: Set Theory

15   ANS: 2

$L + S = 47$

$L - S = 15$

$ 2L = 62$

$ L = 31$

PTS: 2   REF: 060912ia   STA: A.A.7   TOP: Writing Linear Systems

16   ANS: 2

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

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

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

18 ANS: 4 PTS: 2 REF: 060930ia STA: A.A.29
TOP: Set Theory

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

PTS: 2 REF: fall0719ia STA: A.A.9 TOP: Exponential Functions

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

PTS: 2 REF: 011008ia STA: A.A.42 TOP: Trigonometric Ratios

21 ANS: 1 PTS: 2 REF: fall0723ia STA: A.M.3
TOP: Error

22 ANS: 3
$3^2 + 5^2 = x^2$

$34 = x^2$

$\sqrt{34} = x$

PTS: 2 REF: 060909ia STA: A.A.45 TOP: Pythagorean Theorem

23 ANS: 1 PTS: 2 REF: 081030ia STA: A.A.3
TOP: Expressions

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

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

25 ANS: 1 PTS: 2 REF: 080813ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

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

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

$$b = 2$$

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

27 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

3

28 ANS: 4

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

PTS: 2   REF: 011007ia   STA: A.A.33   TOP: Slope

29 ANS: 4

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

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

30 ANS:

60. $_5P_3 = 60$

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

31 ANS: 3   PTS: 2   REF: 011017ia   STA: A.G.5

TOP: Graphing Absolute Value Functions

32 ANS: 2   PTS: 2   REF: 080802ia   STA: A.N.1

TOP: Identifying Properties

33 ANS: 3   PTS: 2   REF: 060924ia   STA: A.G.8

TOP: Solving Quadratics by Graphing

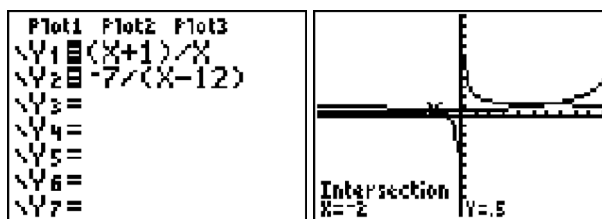34 ANS:

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

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

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

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

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

$x = 6 \text{ or } -2$

PTS: 4   REF: fall0739ia   STA: A.A.26   TOP: Solving Rationals

35 ANS: 2   PTS: 2   REF: 011015ia   STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

36 ANS: 1

$_4P_4 = 4 \times 3 \times 2 \times 1 = 24$

PTS: 2   REF: 080816ia   STA: A.N.8   TOP: Permutations

37 ANS:

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

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

38 ANS: 3

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

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

$$3 = -2 + b$$

$$5 = b$$

PTS: 2 REF: 011013ia STA: A.A.35 TOP: Writing Linear Equations
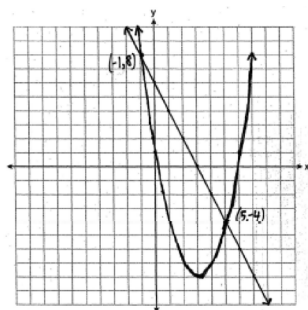
39 ANS: 2 PTS: 2 REF: 060908ia STA: A.S.21
TOP: Empirical Probability

40 ANS:

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

41 ANS: 1

$$1P + 2C = 5$$

$$1P + 4C = 6$$

$$2C = 1$$

$$C = 0.5$$

PTS: 2 REF: 011003ia STA: A.A.7 TOP: Writing Linear Systems

42 ANS: 4
The transformation is a reflection in the *x*-axis.

PTS: 2 REF: fall0722ia STA: A.G.5 TOP: Graphing Absolute Value Functions

43 ANS: 3 PTS: 2 REF: fall0706ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

44 ANS: 1

$$4y - 2x = 0$$

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

$$-4 + 4 = 0$$

PTS: 2 REF: 011021ia STA: A.A.39 TOP: Identifying Points on a Line

45 ANS: 1

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

$$7f + 10 = 1424$$
$$f = 202$$

PTS: 2　　　REF: 060917ia　　STA: A.A.7　　TOP: Writing Linear Systems

46 ANS:

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

$x \approx 84$　　$y \approx 71$

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

47 ANS:

0.102. $\dfrac{(5.3 \times 8.2 \times 4.1) - (5 \times 8 \times 4)}{5.3 \times 8.2 \times 4.1} = \dfrac{178.16 - 160}{178.16} = 0.102$
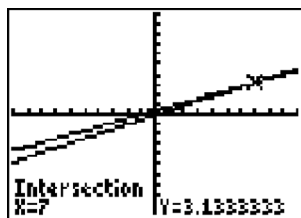
PTS: 3　　　REF: 011036ia　　STA: A.M.3　　TOP: Error

48 ANS: 4

$$\frac{2x}{5} + \frac{1}{3} = \frac{7x - 2}{15}$$
$$\frac{(2x \times 3) + (5 \times 1)}{5 \times 3} = \frac{7x - 2}{15}$$
$$\frac{6x + 5}{15} = \frac{7x - 2}{15}$$
$$6x + 5 = 7x - 2$$
$$x = 7$$

PTS: 2　　　REF: 080820ia　　STA: A.A.25

TOP: Solving Equations with Fractional Expressions

49 ANS:

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

$$x^2 + 6x + 8 = 10x + 20$$
$$x^2 - 4x - 12 = 0$$
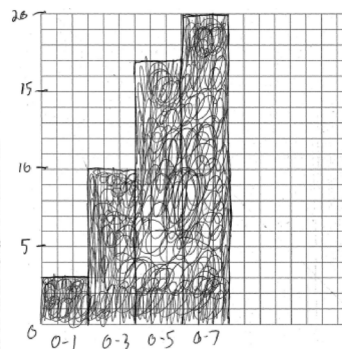$$(x - 6)(x + 2) = 0$$
$$x = 6$$

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

6

50 ANS:

Number of Days Outside

Interval	Tally	Frequency
0–1	|||	3
2–3	⊪||	7
4–5	⊪||	7
6–7	|||	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

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

52 ANS: 4
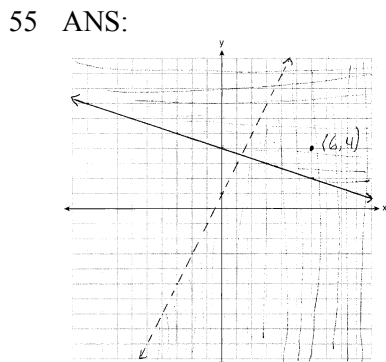$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 \approx 1696.5$

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

53 ANS:

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

$A \approx 53$

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

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

PTS: 2   REF: 060918ia   STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

55 ANS:

PTS: 4   REF: 081037ia   STA: A.G.7   TOP: Systems of Linear Inequalities

56 ANS: 4

$$x^2 - 7x + 6 = 0$$

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

$$x = 6 \quad x = 1$$

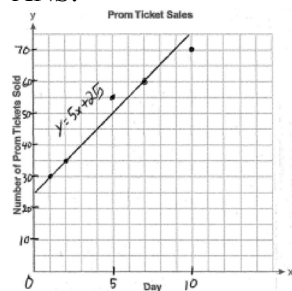PTS: 2   REF: 060902ia   STA: A.A.28   TOP: Roots of Quadratics

57 ANS:

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

58 ANS: 3

$$_6P_4 = 360$$

PTS: 2   REF: 081028ia   STA: A.N.8   TOP: Permutations

59 ANS:

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

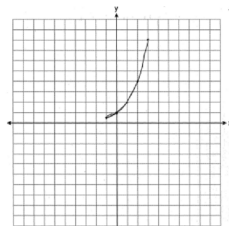PTS: 3   REF: 081035ia   STA: A.G.2   TOP: Surface Area

60 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

61 ANS: 1   PTS: 2   REF: 060920ia   STA: A.G.6
TOP: Linear Inequalities

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

63 ANS: 2

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

$o = 2s \qquad s = 42$

PTS: 2   REF: 080811ia   STA: A.A.7   TOP: Writing Linear Systems

64 ANS: 1   PTS: 2   REF: fall0728ia   STA: A.A.15
TOP: Undefined Rationals

65 ANS: 3

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

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

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

PTS: 2   REF: 081024ia   STA: A.S.23   TOP: Theoretical Probability
KEY: independent events

66 ANS: 4   PTS: 2   REF: 080827ia   STA: A.A.12
TOP: Powers of Powers

67 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

68 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 $\left| \frac{9.261 - 8}{9.261} \right| \approx 0.14.$

PTS: 2   REF: 060928ia   STA: A.M.3   TOP: Error

69 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

70 ANS: 2

$\tan B = \frac{\text{opposite}}{\text{adjacent}} = \frac{8}{15} = 0.5\overline{3}$

PTS: 2   REF: 081026ia   STA: A.A.42   TOP: Trigonometric Ratios

71 ANS: 4

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

$$x = 25$$

PTS: 2   REF: 081020ia   STA: A.S.16   TOP: Average Known with Missing Data

72 ANS: 4

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

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

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

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

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

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

PTS: 2   REF: 011028ia   STA: A.A.26   TOP: Solving Rationals

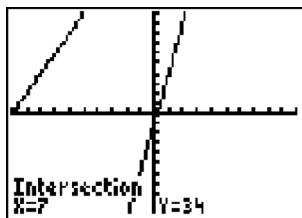73 ANS: 3   PTS: 2   REF: 081008ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares

74 ANS: 4

$$5p - 1 = 2p + 20$$

$$3p = 21$$

$$p = 7$$

PTS: 2   REF: 080801ia   STA: A.A.22   TOP: Solving Equations

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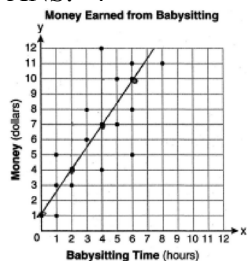   the fencing needed for the semicircular portion of the garden is $\frac{1}{2}\pi d = 3\pi \approx 9.4$ feet.

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

76 ANS: 4

PTS: 2   REF: 080822ia   STA: A.S.8   TOP: Scatter Plots

10

77 ANS:

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

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

78 ANS: 2

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

PTS: 2 REF: 060921ia STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$

79 ANS: 2
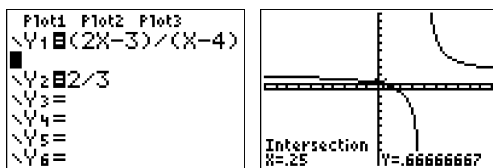
$x + 2y = 9$

$x - y = 3$

$3y = 6$

$y = 2$

PTS: 2 REF: 060925ia STA: A.A.10 TOP: Solving Linear Systems

80 ANS: 4 PTS: 2 REF: fall0717ia STA: A.G.4
TOP: Families of Functions

81 ANS: 2

$$\frac{2x-3}{x-4} = \frac{2}{3}$$

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

$6x - 9 = 2x - 8$

$4x = 1$

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

PTS: 2 REF: 081012ia STA: A.A.26 TOP: Solving Rationals

82 ANS: 1

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

PTS: 2 REF: fall0713ia STA: A.A.35 TOP: Writing Linear Equations

83 ANS: 4

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

PTS: 2 REF: 081013ia STA: A.A.1 TOP: Expressions

84 ANS: 3
The value of the upper quartile is the last vertical line of the box.

PTS: 2   REF: 060915ia   STA: A.S.6   TOP: Box-and-Whisker Plots
85 ANS: 2
$R = 0.5^{d-1}$

PTS: 2   REF: 011006ia   STA: A.A.9   TOP: Exponential Functions
86 ANS: 2
$\left| \dfrac{55.42 - 50.27}{55.42} \right| \approx 0.093$

PTS: 2   REF: 081023ia   STA: A.M.3   TOP: Error
87 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
88 ANS: 4   PTS: 2   REF: 060906ia   STA: A.A.4
TOP: Modeling Inequalities
89 ANS: 4   PTS: 2   REF: fall0730ia   STA: A.G.3
TOP: Defining Functions
90 ANS: 2
$\dfrac{9x^4 - 27x^6}{3x^3} = \dfrac{9x^4(1 - 3x^2)}{3x^3} = 3x(1 - 3x^2)$

PTS: 2   REF: fall0718ia   STA: A.A.14   TOP: Rational Expressions
91 ANS: 3   PTS: 2   REF: 060919ia   STA: A.G.3
TOP: Defining Functions
92 ANS: 4   PTS: 2   REF: 060927ia   STA: A.N.4
TOP: Operations with Scientific Notation
93 ANS: 1   PTS: 2   REF: 011001ia   STA: A.S.6
TOP: Box-and-Whisker Plots
94 ANS: 2   PTS: 2   REF: 011002ia   STA: A.S.20
TOP: Theoretical Probability
95 ANS: 4   PTS: 2   REF: 011025ia   STA: A.A.17
TOP: Addition and Subtraction of Rationals
96 ANS: 2   PTS: 2   REF: 011019ia   STA: A.S.12
TOP: Scatter Plots
97 ANS: 4   PTS: 2   REF: fall0704ia   STA: A.A.29
TOP: Set Theory
98 ANS: 1
A rooster crows before sunrise, not because of the sun.

PTS: 2   REF: fall0707ia   STA: A.S.14   TOP: Analysis of Data

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

PTS: 2   REF: 081004ia   STA: A.A.45   TOP: Pythagorean Theorem

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

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

101 ANS: 4   PTS: 2   REF: 080825ia   STA: A.A.40
TOP: Systems of Linear Inequalities

102 ANS: 4
$$w(w + 5) = 36$$
$$w^2 + 5w - 36 = 0$$

PTS: 2   REF: fall0726ia   STA: A.A.5   TOP: Modeling Equations

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

PTS: 2   REF: 080804ia   STA: A.S.4   TOP: Central Tendency

104 ANS: 4   PTS: 2   REF: 011016ia   STA: A.A.23
TOP: Transforming Formulas

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

106 ANS: 1
$$\left| \frac{289 - 282}{289} \right| \approx 0.024$$

PTS: 2   REF: 080828ia   STA: A.M.3   TOP: Error

107 ANS: 3   PTS: 2   REF: 081017a   STA: A.S.14
TOP: Analysis of Data

108 ANS: 4   PTS: 2   REF: 060916ia   STA: A.A.15
TOP: Undefined Rationals

109 ANS: 1
$$-2x + 5 > 17$$
$$-2x > 12$$
$$x < -6$$

PTS: 2   REF: fall0724ia   STA: A.A.21   TOP: Interpreting Solutions

110 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

111 ANS: 4

$$2x - 3y = 9$$

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

$$0 + 9 = 9$$

PTS: 2   REF: 081016ia   STA: A.A.39   TOP: Identifying Points on a Line

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

113 ANS: 3   PTS: 2   REF: 081001ia   STA: A.S.7
TOP: Scatter Plots

114 ANS: 4

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

PTS: 2   REF: 011018ia   STA: A.G.3   TOP: Defining Functions

115 ANS: 1   PTS: 2   REF: 081015ia   STA: A.G.5
TOP: Graphing Quadratic Functions

116 ANS: 1

$$3(2m - 1) \leq 4m + 7$$

$$6m - 3 \leq 4m + 7$$

$$2m \leq 10$$

$$m \leq 5$$

PTS: 2   REF: 081002ia   STA: A.A.24   TOP: Solving Inequalities

117 ANS: 4

$$\frac{9.2 \times 10^6}{2.3 \times 10^2} = 4 \times 10^4$$

PTS: 2   REF: 081006ia   STA: A.N.4   TOP: Operations with Scientific Notation

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

119 ANS: 1

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

PTS: 2   REF: 011010ia   STA: A.N.6   TOP: Evaluating Expressions

120 ANS: 2

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

PTS: 2   REF: 080806ia   STA: A.A.20   TOP: Factoring Polynomials

121 ANS: 3   PTS: 2   REF: 080819ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: subtraction

122 ANS: 2

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

PTS: 2   REF: 060929ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals
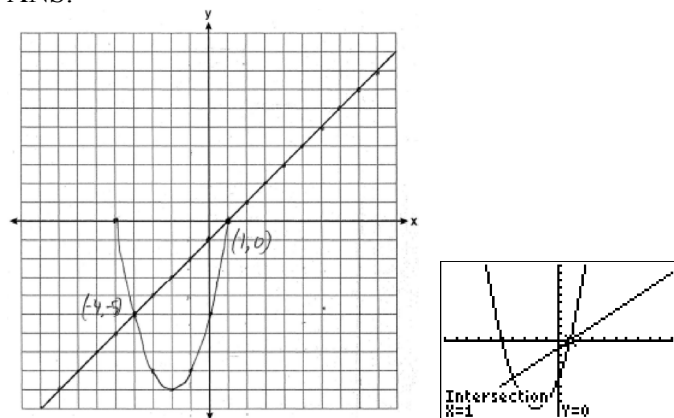
123 ANS: 2   PTS: 2   REF: fall0725ia   STA: A.N.4

TOP: Operations with Scientific Notation

124 ANS:

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

125 ANS:

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

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

126 ANS: 2

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

PTS: 2   REF: fall0709ia   STA: A.S.5   TOP: Box-and-Whisker Plots

127 ANS: 2   PTS: 2   REF: 011022ia   STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

128 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

129 ANS: 4

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

$$5x = 360$$

$$x = 72$$

PTS: 2　　　REF: 060901ia　　STA: A.M.1　　TOP: Speed

130 ANS: 2

$A(-3,8)$ and $B(3,6)$. $m = \frac{8-6}{-3-3} = \frac{2}{-6} = -\frac{1}{3}$

PTS: 2　　　REF: 081005ia　　STA: A.A.33　　TOP: Slope

131 ANS: 3　　　PTS: 2　　REF: 060926ia　　STA: A.N.1
TOP: Properties of Reals

132 ANS: 4

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

PTS: 2　　　REF: 080821ia　　STA: A.A.16　　TOP: Rational Expressions
KEY: $a > 0$

133 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

134 ANS: 4　　　PTS: 2　　REF: 011020ia　　STA: A.A.12
TOP: Multiplication of Powers

135 ANS:

7. $15x + 22 \geq 120$
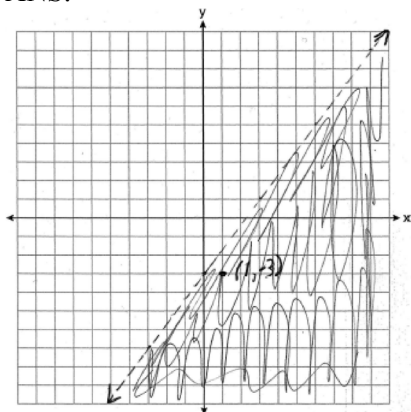
$$x \geq 6.5\overline{3}$$

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

136 ANS: 4　　　PTS: 2　　REF: fall0729ia　　STA: A.A.2
TOP: Expressions

16

137 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

138 ANS: 3   PTS: 2   REF: fall0710ia   STA: A.A.31
TOP: Set Theory

139 ANS:

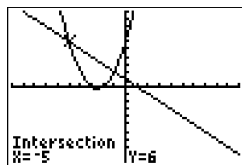$2,160$ $\dfrac{1,200}{25} = \dfrac{x}{45}$

$$25x = 54,000$$

$$x = 2,160$$

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

140 ANS: 1

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

PTS: 2   REF: 080826ia   STA: A.A.18   TOP: Multiplication and Division of Rationals

141 ANS: 2

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

$x^2 + 6x + 5 = 0$ $= -(-5) + 1$

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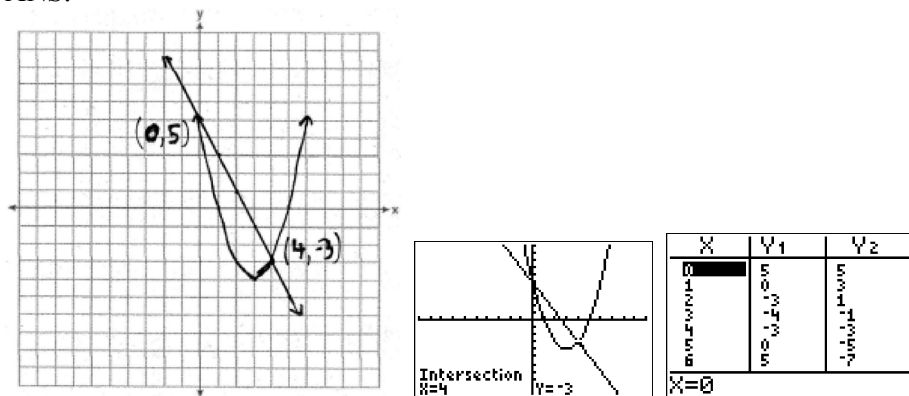
$x = -5 \text{ or } -1$

PTS: 2   REF: 080812ia   STA: A.A.11   TOP: Quadratic-Linear Systems

142 ANS: 4   PTS: 2   REF: fall0715ia   STA: A.A.5
TOP: Modeling Inequalities

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

PTS: 2 REF: 081007ia STA: A.N.5 TOP: Percents

144 ANS: 1 PTS: 2 REF: 011004ia STA: A.A.31
TOP: Set Theory

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

$$4m + 6p = 2.90 \quad 4m + 6p = 2.90 \qquad 6p = .90$$
$$5m = 2.50 \qquad p = \$0.15$$
$$m = \$0.50$$

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

146 ANS: 3
0.75 hours = 45 minutes. $\dfrac{120}{1} = \dfrac{x}{45}$

$$x = 5400$$

PTS: 2 REF: 080814ia STA: A.M.1 TOP: Using Rate

147 ANS: 2
shaded = whole $-$ unshaded

$= $ rectangle-triangle

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

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

$= 90 - 34.5$

$= 55.5$

PTS: 2 REF: 081019ia STA: A.G.1 TOP: Compositions of Polygons and Circles

148 ANS:

PTS: 4 REF: fall0738ia STA: A.G.9 TOP: Quadratic-Linear Systems

149 ANS: 3

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

PTS: 2 REF: 011011ia STA: A.A.14 TOP: Rational Expressions

150 ANS: 1

$$y = mx + b$$

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

$$b = 6$$

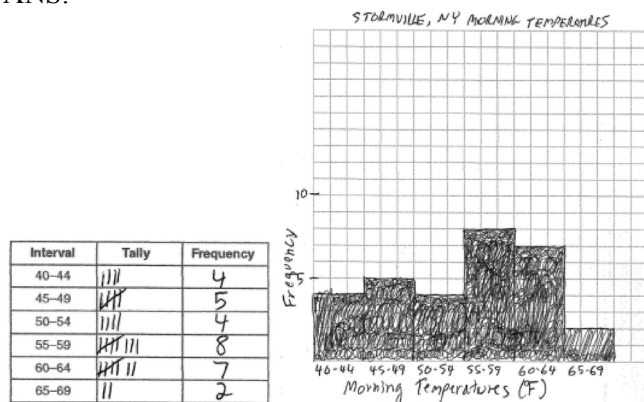PTS: 2 REF: 060922ia STA: A.A.34 TOP: Writing Linear Equations

151 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

152 ANS:

PTS: 4 REF: 060938ia STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables

153 ANS: 2
Debbie failed to distribute the 3 properly.

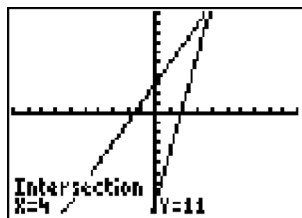PTS: 2 REF: 011009ia STA: A.A.22 TOP: Solving Equations
154 ANS: 2 PTS: 2 REF: 060904ia STA: A.A.1
TOP: Expressions
155 ANS:

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

$12 = 3g$

$g = 4$

PTS: 2 REF: fall0732ia STA: A.A.22 TOP: Solving Equations
156 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
157 ANS: 3
$\dfrac{2+x}{5x} - \dfrac{x-2}{5x} = \dfrac{2+x-x+2}{5x} = \dfrac{4}{5x}$

PTS: 2 REF: 081027ia STA: A.A.17 TOP: Addition and Subtraction of Rationals
158 ANS:
$3a^2 b^2 - 6a$ $\dfrac{45a^4 b^3 - 90a^3 b}{15a^2 b} = \dfrac{45a^4 b^3}{15a^2 b} - \dfrac{90a^3 b}{15a^2 b} = 3a^2 b^2 - 6a$

PTS: 2 REF: 081031ia STA: A.A.14 TOP: Rational Expressions
159 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
160 ANS: 4 PTS: 2 REF: 081025ia STA: A.G.4
TOP: Families of Functions
161 ANS: 2 PTS: 2 REF: 080823ia STA: A.A.32
TOP: Slope
162 ANS: 3
$x = \dfrac{-b}{2a} = \dfrac{-10}{2(-1)} = 5.$

PTS: 2 REF: 081018ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

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

PTS: 2   REF: fall0714ia   STA: A.S.2   TOP: Analysis of Data
164 ANS: 2   PTS: 2   REF: 081014ia   STA: A.A.36
TOP: Parallel and Perpendicular Lines
165 ANS: 4   PTS: 2   REF: 081011ia   STA: A.A.5
TOP: Modeling Equations
166 ANS: 3
Frequency is not a variable.

PTS: 2   REF: 011014ia   STA: A.S.2   TOP: Analysis of Data
167 ANS: 1

$$2y - 2x = 10 \qquad \text{axis of symmetry: } x = \frac{-b}{2a} = \frac{-2}{2(1)} = -1$$
$$2y = 2x + 10$$
$$y = x + 5$$

PTS: 2   REF: 081010ia   STA: A.G.9   TOP: Quadratic-Linear Systems
168 ANS: 2

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

$$x = 300$$

PTS: 2   REF: 080807ia   STA: A.G.4   TOP: Graphing Linear Functions
169 ANS: 4
$$-4x + 2 > 10$$
$$-4x > 8$$
$$x < -2$$

PTS: 2   REF: 080805ia   STA: A.A.21   TOP: Interpreting Solutions
170 ANS: 2

The events are not mutually exclusive: $P(\text{prime}) = \dfrac{3}{6}$, $P(\text{even}) = \dfrac{3}{6}$, $P(\text{prime AND even}) = \dfrac{1}{6}$

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

PTS: 2   REF: 080830ia   STA: A.S.23   TOP: Theoretical Probability
KEY: not mutually exclusive events
171 ANS: 4   PTS: 2   REF: 081022ia   STA: A.A.29
TOP: Set Theory
172 ANS:
{1,2,4,5,9,10,12}

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

173 ANS: 2

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

PTS: 2   REF: fall0720ia   STA: A.G.6   TOP: Linear Inequalities

174 ANS: 1

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

$\dfrac{4}{3}x < 12$

$4x < 36$

$x < 9$

PTS: 2   REF: 060914ia   STA: A.A.21   TOP: Interpreting Solutions

175 ANS:

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

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

176 ANS:

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

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

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

177 ANS: 2

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

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

PTS: 2   REF: 081029ia   STA: A.A.35   TOP: Writing Linear Equations

178 ANS: 3

$5x + 2y = 48$

$3x + 2y = 32$

$2x = 16$

$x = 8$

PTS: 2   REF: fall0708ia   STA: A.A.7   TOP: Writing Linear Systems

179 ANS: 3

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

PTS: 2   REF: 011030ia   STA: A.S.14   TOP: Analysis of Data

180 ANS: 2

$$l(l-5) = 24$$

$$l^2 - 5l - 24 = 0$$

$$(l-8)(l+3) = 0$$

$$l = 8$$

PTS: 2   REF: 080817ia   STA: A.A.8   TOP: Geometric Applications of Quadratics

181 ANS: 1

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

PTS: 2   REF: 011026ia   STA: A.A.38   TOP: Parallel and Perpendicular Lines

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

183 ANS: 3   PTS: 2   REF: fall0705ia   STA: A.N.1
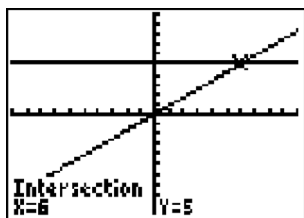TOP: Identifying Properties

184 ANS:
81.3, 80, both increase

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

185 ANS: 3   PTS: 2   REF: fall0702ia   STA: A.S.23
TOP: Theoretical Probability   KEY: mutually exclusive events

186 ANS: 1

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

$$\frac{12x + 3x}{18} = 5$$
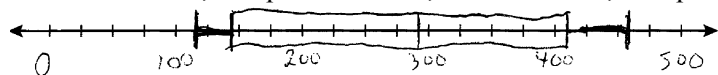
$$15x = 90$$

$$x = 6$$

PTS: 2   REF: 060907ia   STA: A.A.25
TOP: Solving Equations with Fractional Expressions

187 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

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

189 ANS: 3

$$a + ar = b + r$$

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

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

PTS: 2   REF: 060913ia   STA: A.A.23   TOP: Transforming Formulas

190 ANS: 1

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

PTS: 2   REF: fall0721ia   STA: A.A.42   TOP: Trigonometric Ratios

191 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

192 ANS: 1   PTS: 2   REF: 060903ia   STA: A.A.12

TOP: Division of Powers

193 ANS: 3

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

$$A \approx 38.7$$

PTS: 2   REF: 080829ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

194 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

195 ANS: 1   PTS: 2   REF: 080803ia   STA: A.A.4

TOP: Modeling Inequalities

Integrated Algebra Regents at Random
Answer Section

196 ANS: 2

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

PTS: 2   REF: 080926ia   STA: A.M.3   TOP: Error

197 ANS: 3
The other situations are quantitative.

PTS: 2   REF: 060819ia   STA: A.S.1   TOP: Analysis of Data

198 ANS: 1   PTS: 2   REF: 080911ia   STA: A.A.36
TOP: Parallel and Perpendicular Lines

199 ANS: 1

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

PTS: 2   REF: 080915ia   STA: A.A.33   TOP: Slope

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

PTS: 2   REF: 080910ia   STA: A.S.3   TOP: Analysis of Data

201 ANS: 2

$$P = 2l + 2w$$

$$P - 2l = 2w$$

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

PTS: 2   REF: 010911ia   STA: A.A.23   TOP: Transforming Formulas

202 ANS: 1

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

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

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

PTS: 2   REF: 080918ia   STA: A.A.15   TOP: Undefined Rationals

203 ANS: 4

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

PTS: 2   REF: 010903ia   STA: A.S.22   TOP: Theoretical Probability

204 ANS: 1   PTS: 2   REF: 060804ia   STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

205 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

206 ANS:

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

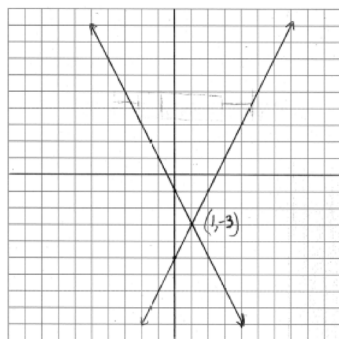PTS: 3 REF: 060835ia STA: A.N.5 TOP: Percents

207 ANS:

$-6a + 42$. distributive

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

208 ANS: 3

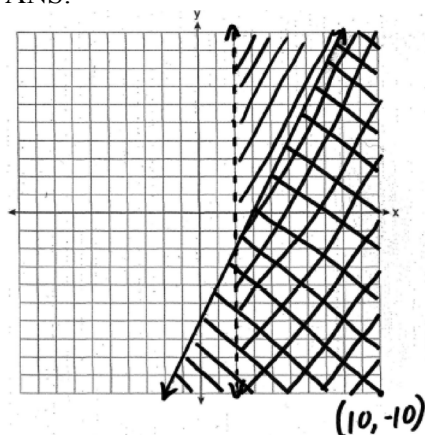$\left| -5(5) + 12 \right| = \left| -13 \right| = 13$

PTS: 2 REF: 080923ia STA: A.N.6 TOP: Evaluating Expressions

209 ANS:

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

210 ANS:

PTS: 4 REF: 010938ia STA: A.G.7 TOP: Systems of Linear Inequalities

ID: A

211 ANS: 2   PTS: 2   REF: 080901ia   STA: A.A.4
    TOP: Modeling Equations
212 ANS:
$$\frac{600-592}{592} \approx 0.014$$

    PTS: 2   REF: 061031ia   STA: A.M.3   TOP: Relative Error
213 ANS: 3   PTS: 2   REF: 010917ia   STA: A.A.29
    TOP: Set Theory
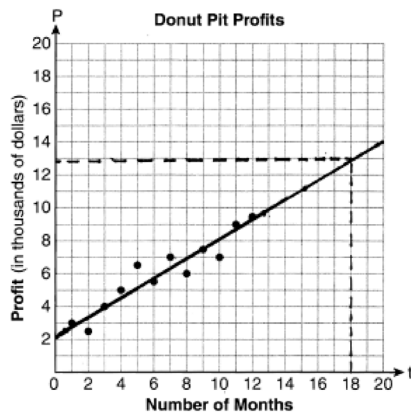214 ANS: 2   PTS: 2   REF: 080930ia   STA: A.S.17
    TOP: Scatter Plots
215 ANS: 3   PTS: 2   REF: 080925ia   STA: A.G.4
    TOP: Identifying the Equation of a Graph
216 ANS:
    $10+2d \geq 75$, 33. $10+2d \geq 75$

    $$d \geq 32.5$$

    PTS: 3   REF: 060834ia   STA: A.A.6   TOP: Modeling Inequalities
217 ANS: 3
    $$F = \frac{9}{5}C + 32 = \frac{9}{5}(15) + 32 = 59$$

    PTS: 2   REF: 010901ia   STA: A.M.2   TOP: Conversions
218 ANS:

They will not reach their goal in 18 months.

    PTS: 3   REF: 061036ia   STA: A.S.17   TOP: Scatter Plots
219 ANS:
    1,512, 1,551.25, 0.025. $36 \times 42 = 1512$. $36.5 \times 42.5 = 1551.25$. $RE = \left| \frac{1512-1551.25}{1551.25} \right| \approx 0.025$.

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

220 ANS:

$(-2, 11).$ $x = \dfrac{-b}{2a} = \dfrac{-(-8)}{2(-2)} = -2$

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

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

221 ANS:

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

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

222 ANS: 2

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

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

$3x + 6 = 5x - 20$

$26 = 2x$

$x = 13$

PTS: 2   REF: 080909ia   STA: A.A.25
TOP: Solving Equations with Fractional Expressions

223 ANS: 4

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

PTS: 2   REF: 061025ia   STA: A.M.1   TOP: Speed

224 ANS: 3

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

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

$r = 84 - 2r + 3$

$3r = 87$

$r = 29$

PTS: 2   REF: 060812ia   STA: A.A.7   TOP: Writing Linear Systems

225 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

226 ANS: 3

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

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

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

$$d = 2$$

PTS: 2   REF: 061012ia   STA: A.A.10   TOP: Solving Linear Systems

227 ANS:

$$0 \le t \le 40$$

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

228 ANS: 2

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

PTS: 2   REF: 060824ia   STA: A.A.14   TOP: Rational Expressions

229 ANS: 4   PTS: 2   REF: 010930ia   STA: A.G.3

TOP: Defining Functions

230 ANS: 4   PTS: 2   REF: 061028ia   STA: A.G.6

TOP: Linear Inequalities

231 ANS:

$(-2, 5)$. $3x + 2y = 4 \quad 12x + 8y = 16$. $3x + 2y = 4$

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

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

$$x = -2$$

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

232 ANS: 2   PTS: 2   REF: 010916ia   STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

233 ANS: 3   PTS: 2   REF: 060825ia   STA: A.A.45

TOP: Pythagorean Theorem

234 ANS:

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

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

235 ANS: 4   PTS: 2   REF: 010929ia   STA: A.S.6

TOP: Box-and-Whisker Plots

236 ANS: 1   PTS: 2   REF: 061010ia   STA: A.A.40

TOP: Systems of Linear Inequalities

237 ANS: 3

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

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

238 ANS: 2   PTS: 2   REF: 010909ia   STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

239 ANS: 3

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

PTS: 2   REF: 080929ia   STA: A.A.9   TOP: Exponential Functions

240 ANS: 2

$3c + 4m = 12.50$

$3c + 2m = 8.50$

$\quad\ 2m = 4.00$

$\quad\ \ m = 2.00$

PTS: 2   REF: 060806ia   STA: A.A.7   TOP: Writing Linear Systems

241 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 $\{-1, 0, 2, 3, 4\}$.

PTS: 2   REF: 060818ia   STA: A.A.30   TOP: Set Theory

242 ANS: 3

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

PTS: 2   REF: 060820ia   STA: A.A.33   TOP: Slope

243 ANS: 1

$x - 2y = 1$

$x + 4y = 7$

$\ -6y = -6$

$\quad\ y = 1$

PTS: 2   REF: 080920ia   STA: A.A.10   TOP: Solving Linear Systems

244 ANS: 1

$13.95 + 0.49s \le 50.00$

$\qquad 0.49s \le 36.05$

$\qquad\quad\ s \le 73.57$

PTS: 2   REF: 080904ia   STA: A.A.6   TOP: Modeling Inequalities

245 ANS: 3

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

$\quad\ x \approx 21$

PTS: 2   REF: 010912ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side

246 ANS: 3

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

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

$$5x + 3 = 6x$$

$$3 = x$$

PTS: 2   REF: 061019ia   STA: A.A.25
TOP: Solving Equations with Fractional Expressions

247 ANS: 3

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

PTS: 2   REF: 061008ia   STA: A.N.3   TOP: Operations with Radicals
KEY: subtraction

248 ANS: 3   PTS: 2   REF: 080907ia   STA: A.S.20
TOP: Theoretical Probability

249 ANS: 4

$$5 \times 2 \times 3 = 30$$

PTS: 2   REF: 061002ia   STA: A.N.7   TOP: Multiplication Counting Principle

250 ANS:

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

$$w^2 + 15w - 54 = 0$$

$$(w+18)(w-3) = 0$$

$$w = 3$$

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

251 ANS: 3

2(1)+3=5

PTS: 2   REF: 061007ia   STA: A.A.39   TOP: Linear Equations

252 ANS: 3

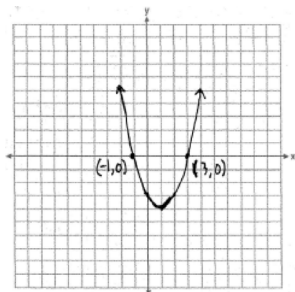$25 - 18 = 7$

PTS: 2   REF: 060822ia   STA: A.S.9
TOP: Frequency Histograms, Bar Graphs and Tables

253 ANS:

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

254 ANS: 3

$$x^2 - 9 = 0$$

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

$$x = \pm 3$$

    PTS: 2   REF: 061014ia   STA: A.A.15   TOP: Undefined Rationals

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

256 ANS: 1

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

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

$$x = -8$$

    PTS: 2   REF: 010918ia   STA: A.A.25   TOP: Solving Rationals

257 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

258 ANS: 4

$$-2(x - 5) < 4$$

$$-2x + 10 < 4$$

$$-2x < -6$$

$$x > 3$$

    PTS: 2   REF: 080913ia   STA: A.A.21   TOP: Interpreting Solutions

259 ANS: 4

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

$$2x - 4 = 48$$
$$x = 26$$

PTS: 2   REF: 080928ia   STA: A.A.6   TOP: Modeling Equations

260 ANS: 4

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

PTS: 2   REF: 080912ia   STA: A.A.30   TOP: Set Theory

261 ANS:

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

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

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

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

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

262 ANS: 2

$1.5^3 = 3.375$

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

263 ANS: 2

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

PTS: 2   REF: 061004ia   STA: A.A.33   TOP: Slope

264 ANS: 4

$P(G \text{ or } W) = \dfrac{4}{8}, P(G \text{ or } B) = \dfrac{3}{8}, P(Y \text{ or } B) = \dfrac{4}{8}, P(Y \text{ or } G) = \dfrac{5}{8}$

PTS: 2   REF: 060802ia   STA: A.S.22   TOP: Theoretical Probability

265 ANS: 2   PTS: 2   REF: 061023ia   STA: A.A.23

TOP: Transforming Formulas

266 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

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

268 ANS: 4

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

PTS: 2   REF: 010902ia   STA: A.M.1   TOP: Speed

269 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

270 ANS: 3   PTS: 2   REF: 060817ia   STA: A.A.15
TOP: Undefined Rationals

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

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

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

273 ANS: 4   PTS: 2   REF: 010908ia   STA: A.A.9
TOP: Exponential Functions

274 ANS: 3   PTS: 2   REF: 061017ia   STA: A.S.11
TOP: Quartiles and Percentiles

275 ANS: 1

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

$$c^2 = 289$$

$$c = 17$$

PTS: 2   REF: 080906ia   STA: A.A.45   TOP: Pythagorean Theorem

276 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

277 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

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

PTS: 2 REF: 080908ia STA: A.S.13 TOP: Analysis of Data

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

PTS: 2 REF: 080905ia STA: A.N.7 TOP: Conditional Probability
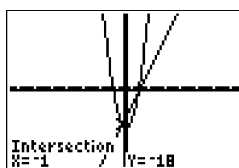
280 ANS:

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

281 ANS: 2

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

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

$(x=5)(x+1)=0$ $=-18$

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

PTS: 2 REF: 010922ia STA: A.A.11 TOP: Quadratic-Linear Systems

282 ANS: 2

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

$A\approx 42$

PTS: 2 REF: 060816ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

283 ANS: 4 PTS: 2 REF: 010927ia STA: A.N.4
TOP: Operations with Scientific Notation

284 ANS: 4

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

PTS: 2 REF: 060813ia STA: A.A.12 TOP: Division of Powers

285 ANS:

$\dfrac{3}{8}$. (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

286 ANS: 1

$0.07m + 19 \le 29.50$

$0.07m \le 10.50$

$m \le 150$

PTS: 2   REF: 010904ia   STA: A.A.6   TOP: Modeling Inequalities

287 ANS: 3   PTS: 2   REF: 010910ia   STA: A.A.35
TOP: Writing Linear Equations

288 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.

PTS: 2   REF: 010923ia   STA: A.S.3   TOP: Analysis of Data

289 ANS:

$-12.$ $3\left(\dfrac{2}{3}x + 3 < -2x - 7\right)$

$x + 9 < -6x - 21$

$7x < -30$

$x < \dfrac{-30}{7}$

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

290 ANS: 2

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

PTS: 2   REF: 080917ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

291 ANS: 1   PTS: 2   REF: 061024ia   STA: A.A.17
TOP: Addition and Subtraction of Rationals

292 ANS: 3   PTS: 2   REF: 061003ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: addition

293 ANS: 4   PTS: 2   REF: 080903ia   STA: A.A.12
TOP: Multiplication of Powers

294 ANS: 4   PTS: 2   REF: 061001ia   STA: A.A.30
TOP: Set Theory

295 ANS: 4   PTS: 2   REF: 061018ia   STA: A.A.12
TOP: Division of Powers

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

PTS: 2   REF: 080919ia   STA: A.G.3   TOP: Defining Functions

297 ANS: 2

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

PTS: 2   REF: 061009ia   STA: A.A.42   TOP: Trigonometric Ratios

298 ANS: 4   PTS: 2   REF: 061022ia   STA: A.S.3
TOP: Analysis of Data

299 ANS: 4   PTS: 2   REF: 060829ia   STA: A.G.5
TOP: Graphing Quadratic Functions

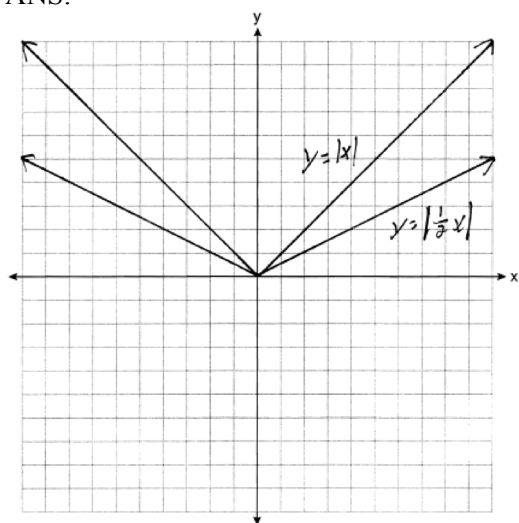300 ANS: 1

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

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

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

302 ANS:

. Graph becomes wider as the coefficient approaches 0.

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

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

304 ANS: 2

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

$$x \approx 15.6$$

PTS: 2   REF: 080914ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side

305 ANS: 1

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

PTS: 2   REF: 061030ia   STA: A.A.9   TOP: Exponential Functions

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

PTS: 2   REF: 060823ia   STA: A.A.1   TOP: Expressions

307 ANS: 2   PTS: 2   REF: 010925ia   STA: A.A.15
TOP: Undefined Rationals

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

309 ANS: 2

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

PTS: 2   REF: 061029ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
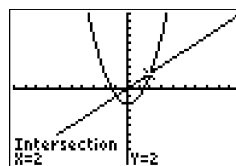
310 ANS: 3
$$x^2 - 6x = 0$$
$$x(x - 6) = 0$$
$$x = 0\ \ x = 6$$

PTS: 2   REF: 080921ia   STA: A.A.27   TOP: Solving Quadratics by Factoring

311 ANS: 4

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

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

PTS: 2   REF: 060810ia   STA: A.A.11   TOP: Quadratic-Linear Systems

312 ANS: 4   PTS: 2   REF: 061013ia   STA: A.G.3
TOP: Defining Functions

313 ANS: 1   PTS: 2   REF: 010905ia   STA: A.G.4
TOP: Families of Functions

314 ANS: 1   PTS: 2   REF: 061021ia   STA: A.A.29
TOP: Set Theory

315 ANS: 3   PTS: 2   REF: 060808ia   STA: A.N.8
TOP: Permutations
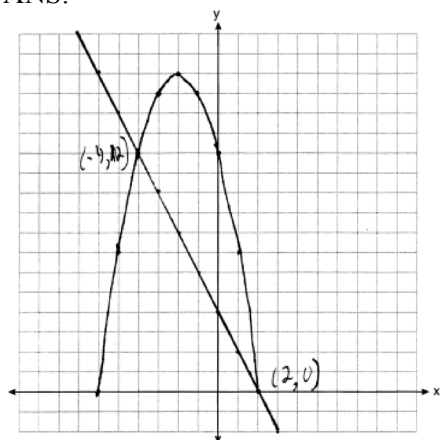
316 ANS: 1   PTS: 2   REF: 080924ia   STA: A.G.1
TOP: Compositions of Polygons and Circles

14

317 ANS:

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

318 ANS: 4

$$_8P_3 = 336$$

PTS: 2   REF: 061026ia   STA: A.N.8   TOP: Permutations

319 ANS: 2

$$m = \frac{5-3}{2-7} = -\frac{2}{5}$$

PTS: 2   REF: 010913ia   STA: A.A.33   TOP: Slope

320 ANS: 1

To determine student interest, survey the widest range of students.

PTS: 2   REF: 060803ia   STA: A.S.3   TOP: Analysis of Data

321 ANS: 1

The slope of both is −4.

PTS: 2   REF: 060814ia   STA: A.A.38   TOP: Parallel and Perpendicular Lines

322 ANS: 1   PTS: 2   REF: 060811ia   STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

323 ANS:

Greg's rate of 5.5 is faster than Dave's rate of 5.3. $\dfrac{\text{distance}}{\text{time}} = \dfrac{11}{2} = 5.5.$ $\dfrac{16}{3} = 5.\overline{3}$
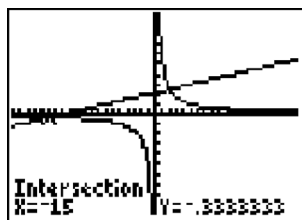
PTS: 3   REF: 080936ia   STA: A.M.1   TOP: Speed

324 ANS: 2

$y - kx = 7$ may be rewritten as $y = kx + 7$

PTS: 2   REF: 061015ia   STA: A.A.38   TOP: Parallel and Perpendicular Lines

325 ANS: 4

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

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

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

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

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

PTS: 2 REF: 060826ia STA: A.A.26 TOP: Solving Rationals

326 ANS: 1 PTS: 2 REF: 061005ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

327 ANS: 1 PTS: 2 REF: 060801ia STA: A.G.4
TOP: Families of Functions

328 ANS: 2

$$\sin U = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{15}{17}$$

PTS: 2 REF: 010919ia STA: A.A.42 TOP: Trigonometric Ratios

329 ANS: 4

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

PTS: 2 REF: 060815ia STA: A.A.18 TOP: Multiplication and Division of Rationals

330 ANS: 1 PTS: 2 REF: 080902ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

331 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

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

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

333 ANS: 2
$5\sqrt{20} = 5\sqrt{4}\sqrt{5} = 10\sqrt{5}$

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

334 ANS: 1

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

PTS: 2   REF: 010926ia   STA: A.A.38   TOP: Parallel and Perpendicular Lines

335 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

336 ANS: 2

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

PTS: 2   REF: 010921ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

337 ANS: 4

$$y = mx + b$$
$$-1 = (2)(3) + b$$
$$b = -7$$

PTS: 2   REF: 080927ia   STA: A.A.34   TOP: Writing Linear Equations

338 ANS:

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

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

339 ANS:

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

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

340 ANS:

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

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

341 ANS: 4

$$A = lw = (3w - 7)(w) = 3w^2 - 7w$$
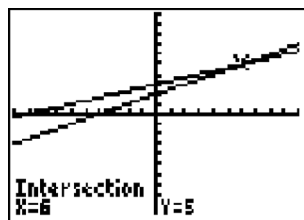
PTS: 2   REF: 010924ia   STA: A.A.1   TOP: Expressions

342 ANS: 3

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

PTS: 2   REF: 061006ia   STA: A.S.21   TOP: Experimental Probability

343 ANS: 3

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

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

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

$$k = 6$$

PTS: 2   REF: 010906ia   STA: A.A.26   TOP: Solving Rationals

344 ANS: 1

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

PTS: 2   REF: 010928ia   STA: A.S.23   TOP: Theoretical Probability
KEY: independent events

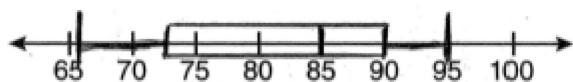345 ANS: 4   PTS: 2   REF: 060805ia   STA: A.S.12
TOP: Scatter Plots

346 ANS:

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

347 ANS: 1

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

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

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

$$x = 9$$

PTS: 2   REF: 061020ia   STA: A.A.8   TOP: Writing Quadratics

348 ANS: 4
The mean is $80.\overline{6}$, the median is 84.5 and the mode is 87.

PTS: 2   REF: 010907ia   STA: A.S.4   TOP: Central Tendency

349 ANS: 1   PTS: 2   REF: 060807ia   STA: A.A.13
TOP: Multiplication of Polynomials

350 ANS: 3

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

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

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

  PTS: 2   REF: 010914ia   STA: A.A.28   TOP: Roots of Quadratics

351 ANS: 2   PTS: 2   REF: 010915ia   STA: A.A.5

  TOP: Modeling Equations