JEFFERSON MATH PROJECT
REGENTS AT RANDOM

The NY Integrated Algebra Regents Exams
Fall 2007-January 2012
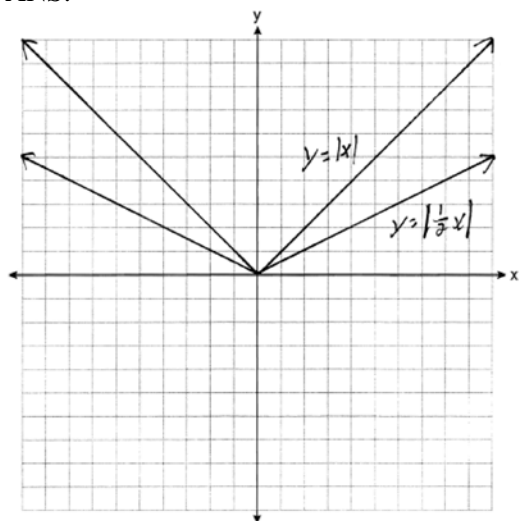### (Answer Key)

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:

. Graph becomes wider as the coefficient approaches 0.

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

2 ANS: 1

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

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

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

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

4 ANS: 2

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

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

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

$$26 = 2x$$

$$x = 13$$

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

5 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
KEY: division

6 ANS: 3

$$m = \frac{4 - 10}{3 - (-6)} = -\frac{2}{3}$$
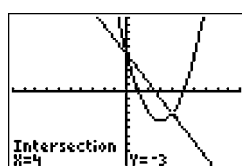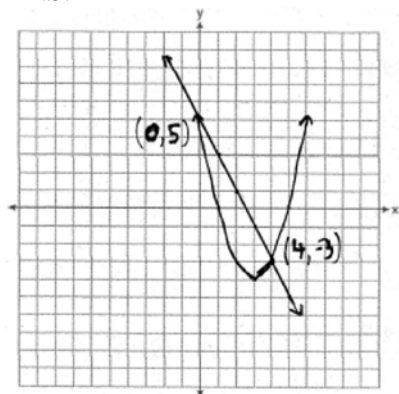
PTS: 2   REF: fall0716ia   STA: A.A.33   TOP: Slope

7 ANS: 2

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

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

8 ANS:

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

9 ANS: 2   PTS: 2   REF: 011212ia   STA: A.S.23
TOP: Theoretical Probability   KEY: independent events

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

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

12 ANS: 1   PTS: 2   REF: 011126ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: subtraction

13 ANS: 1

$$x - 2y = 1$$

$$x + 4y = 7$$

$$-6y = -6$$

$$y = 1$$

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

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

15 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

16 ANS: 4   PTS: 2   REF: 011225ia   STA: A.A.31
     TOP: Set Theory

17 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

18 ANS: 2

$\left| \dfrac{(2.6 \times 6.9) - (2.5 \times 6.8)}{(2.6 \times 6.9)} \right| \approx 0.052$

     PTS: 2   REF: 011209ia   STA: A.M.3   TOP: Error
     KEY: area

19 ANS:

$0.029.\ \dfrac{[2\pi(5.1)^2 + 2\pi(5.1)(15.1)] - [2\pi(5)^2 + 2\pi(5)(15)]}{2\pi(5.1)^2 + 2\pi(5.1)(15.1)} \approx \dfrac{647.294 - 628.319}{647.294} \approx 0.029$

     PTS: 4   REF: 011137ia   STA: A.M.3   TOP: Error
     KEY: volume and surface area

20 ANS: 4

$y = mx + b$

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

$b = -7$

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

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

22 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

23 ANS: 4   PTS: 2   REF: 011229ia   STA: A.S.8
     TOP: Scatter Plots

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

25 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

26 ANS:

7. $15x + 22 \geq 120$

$\qquad x \geq 6.5\overline{3}$

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

27 ANS: 2   PTS: 2   REF: 011119ia   STA: A.A.29

TOP: Set Theory

28 ANS: 1

$x = \dfrac{-b}{2a} = \dfrac{-6}{2(-1)} = 3.$

PTS: 2   REF: 011127ia   STA: A.A.41

TOP: Identifying the Vertex of a Quadratic Given Equation

29 ANS: 2

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

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

30 ANS: 1   PTS: 2   REF: 080924ia   STA: A.G.1

TOP: Compositions of Polygons and Circles   KEY: perimeter

31 ANS: 3

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

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

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

$\qquad d = 2$

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

32 ANS: 4   PTS: 2   REF: 061016ia   STA: A.A.2

TOP: Expressions

33 ANS: 2   PTS: 2   REF: fall0701ia   STA: A.S.7

TOP: Scatter Plots

34 ANS: 2

$A = lw + lw + \dfrac{\pi r^2}{4} = 5 \cdot 3 + 5 \cdot 3 + \dfrac{\pi \cdot 3^2}{4} \approx 37$

PTS: 2   REF: 011123ia   STA: A.G.1   TOP: Compositions of Polygons and Circles

KEY: area

35 ANS: 4

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

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

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

37 ANS: 3

$(3-1) \times 2 \times 3 = 12$

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

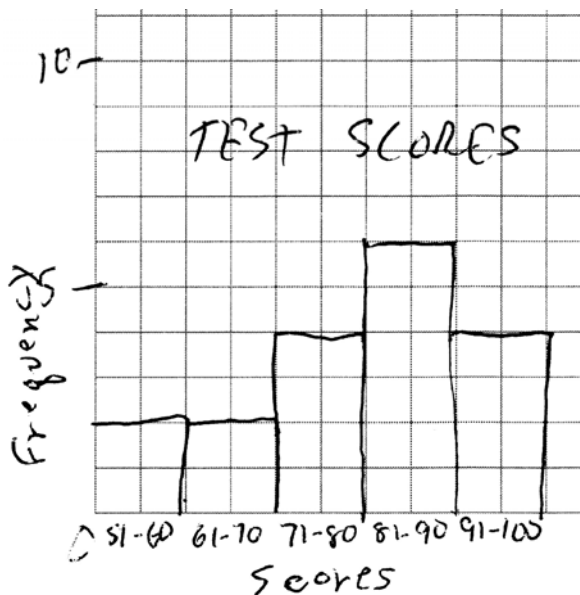38 ANS: 3   PTS: 2   REF: 080907ia   STA: A.S.20
TOP: Geometric Probability

39 ANS: 3

2(1)+3=5

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

40 ANS:

Interval	Tally	Frequency
51–60	||	2
61–70	||	2
71–80	||||	4
81–90	⊔⊔⊔⊤|	6
91–100	||||	4

PTS: 3   REF: 011135ia   STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables   KEY: frequency histograms

41 ANS:

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

PTS: 2   REF: 011233ia   STA: A.A.16   TOP: Rational Expressions
KEY: $a > 0$

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

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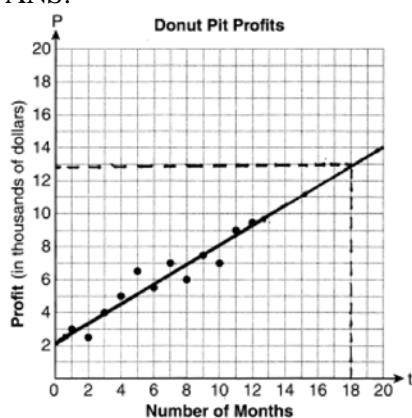TOP: Expressions

44 ANS: 1

$-2x + 5 > 17$

$-2x > 12$

$x < -6$

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

45 ANS: 3

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

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

46 ANS:

They will not reach their goal in 18 months.

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

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

48 ANS: 4

$_8P_3 = 336$

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

49 ANS: 2

$a^3 - 4a = a(a^2 - 4) = a(a - 2)(a + 2)$

PTS: 2   REF: 011108ia   STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

50 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

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

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

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

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

54 ANS: 4

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

PTS: 2   REF: 011216ia   STA: A.A.12   TOP: Powers of Powers

55 ANS: 3
$$2\sqrt{45} = 2\sqrt{9}\sqrt{5} = 6\sqrt{5}$$

PTS: 2   REF: 011203ia   STA: A.N.2   TOP: Simplifying Radicals

56 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

57 ANS: 3   PTS: 2   REF: 011103ia   STA: A.S.12
TOP: Scatter Plots

58 ANS: 3
$\left|-5(5) + 12\right| = \left|-13\right| = 13$

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

59 ANS:

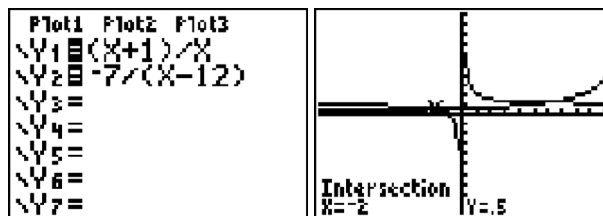6,–2. $\dfrac{x+1}{x} = \dfrac{-7}{x-12}$

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

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

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

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

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

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

60 ANS: 4

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

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

PTS: 2　　　　REF: fall0726ia　　STA: A.A.5　　　TOP: Modeling Equations
61 ANS: 2　　　　PTS: 2　　　　REF: 011227ia　　STA: A.A.3
TOP: Expressions
62 ANS: 4　　　　PTS: 2　　　　REF: fall0704ia　　STA: A.A.29
TOP: Set Theory
63 ANS: 1　　　　PTS: 2　　　　REF: 011202ia　　STA: A.A.9
TOP: Exponential Functions
64 ANS: 2
The other sets of data are qualitative.

PTS: 2　　　　REF: 011211ia　　STA: A.S.1　　　TOP: Analysis of Data
65 ANS:
147.75　$2 \times 5.5 \times 3 + 2 \times 6.75 \times 3 + 2 \times 5.5 \times 6.75 = 147.75$

PTS: 2　　　　REF: 011231ia　　STA: A.G.2　　　TOP: Surface Area
66 ANS: 3　　　　PTS: 2　　　　REF: 011224ia　　STA: A.N.1
TOP: Properties of Reals
67 ANS: 4　　　　PTS: 2　　　　REF: 061013ia　　STA: A.G.3
TOP: Defining Functions
68 ANS: 3

$$\frac{(10w^3)^2}{5w} = \frac{100w^6}{5w} = 20w^5$$

PTS: 2　　　　REF: 011124ia　　STA: A.A.12　　　TOP: Powers of Powers
69 ANS: 3
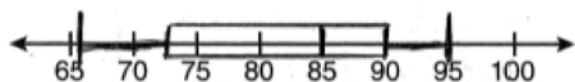The number of correct answers on a test causes the test score.

PTS: 2　　　　REF: 080908ia　　STA: A.S.13　　　TOP: Analysis of Data
70 ANS:
24,435.19.　$30000(.95)^4 \approx 24435.19$

PTS: 4　　　　REF: 011138ia　　STA: A.A.9　　　TOP: Exponential Functions
71 ANS:

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

8

72 ANS:

The turtle won by .5 minutes. Turtle: $\dfrac{d}{s} = \dfrac{100}{20} = 5$. Rabbit: $\dfrac{d}{s} = \dfrac{100}{40} = 2.5 + 3 = 5.5$

PTS: 3   REF: 011236ia   STA: A.M.1   TOP: Speed

73 ANS: 3
$75 - 15 = 60$

PTS: 2   REF: 011113ia   STA: A.S.6   TOP: Box-and-Whisker Plots

74 ANS: 1

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

PTS: 2   REF: 011219ia   STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

75 ANS: 1   PTS: 2   REF: 011210ia   STA: A.G.6
TOP: Linear Inequalities

76 ANS: 1
$8^2 + 15^2 = c^2$

$c^2 = 289$

$c = 17$

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

77 ANS: 2   PTS: 2   REF: 011110ia   STA: A.N.6
TOP: Evaluating Expressions

78 ANS: 4   PTS: 2   REF: 061028ia   STA: A.G.6
TOP: Linear Inequalities

79 ANS: 3

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

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

80 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

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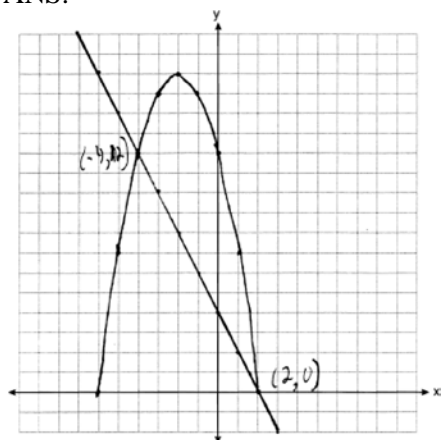The transformation is a reflection in the x-axis.

PTS: 2   REF: 011206ia   STA: A.G.5   TOP: Graphing Absolute Value Functions

82 ANS: 4
The other sets of data are qualitative.

PTS: 2   REF: 011116ia   STA: A.S.1   TOP: Analysis of Data

83 ANS:

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

84 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

85 ANS: 3

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

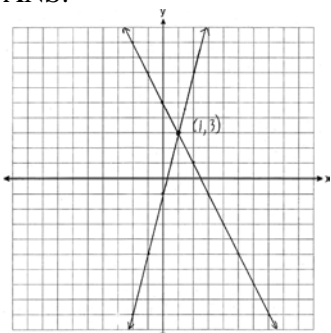PTS: 2 REF: fall0703ia STA: A.A.12 TOP: Division of Powers

86 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

87 ANS: 1 PTS: 2 REF: 011101ia STA: A.A.31
TOP: Set Theory

88 ANS:

PTS: 3 REF: 011235ia STA: A.G.7 TOP: Solving Linear Systems

89 ANS: 1 PTS: 2 REF: fall0723ia STA: A.M.3
TOP: Error KEY: area

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

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

92 ANS:

$$2.1. \quad \cos 65 = \frac{x}{5}$$

$$x \approx 2.1$$

     PTS: 2   REF: 011133ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side

93 ANS: 3   PTS: 2   REF: 080925ia   STA: A.G.4
     TOP: Identifying the Equation of a Graph

94 ANS: 1

If the area of the square is 36, a side is 6, the diameter of the circle is 6, and its radius is 3. $A = \pi r^2 = 3^2 \pi = 9\pi$

     PTS: 2   REF: 011217ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
     KEY: area

95 ANS: 2

$$J - M = 3$$

$$8J + 8M = 120$$

$$8J - 8M = 24$$

$$16J = 144$$

$$J = 9$$

     PTS: 2   REF: 011115ia   STA: A.A.7   TOP: Writing Linear Systems

96 ANS:

$$5. \quad 48 \text{ inches} \times \frac{1 \text{ yard}}{36 \text{ inches}} = \frac{4}{3} \text{ yards} \times \$3.75 = \$5.00$$

     PTS: 2   REF: 011131ia   STA: A.M.2   TOP: Conversions

97 ANS: 3   PTS: 2   REF: 011104ia   STA: A.A.1
     TOP: Expressions

98 ANS: 1

$$\frac{2x}{3} + \frac{1}{2} = \frac{5}{6}$$

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

$$6x = 3$$

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

     PTS: 2   REF: 011112ia   STA: A.A.25
     TOP: Solving Equations with Fractional Expressions

99 ANS: 3

$b = 3 + d$ $(3 + d)d = 40$

$bd = 40$ $d^2 + 3d - 40 = 0$

$(d + 8)(d - 5) = 0$

$d = 5$

PTS: 2   REF: 011208ia   STA: A.A.8   TOP: Writing Quadratics

100 ANS: 2   PTS: 2   REF: 080930ia   STA: A.S.17

TOP: Scatter Plots

101 ANS: 1   PTS: 2   REF: 080902ia   STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

102 ANS: 4

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

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

103 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

104 ANS: 1

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

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

105 ANS: 4

$5 \times 2 \times 3 = 30$

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

106 ANS:

$\dfrac{1375}{1600} \cdot \dfrac{40^2 - 15^2}{40^2} = \dfrac{1375}{1600}$

PTS: 2   REF: 011132ia   STA: A.S.20   TOP: Geometric Probability

107 ANS: 4   PTS: 2   REF: fall0717ia   STA: A.G.4

TOP: Families of Functions

108 ANS: 3

$\dfrac{3 + 2 + 4 + 3}{20} = \dfrac{12}{20}$

PTS: 2   REF: 011129ia   STA: A.S.21   TOP: Experimental Probability

109 ANS: 1   PTS: 2   REF: 011213ia   STA: A.A.13

TOP: Addition and Subtraction of Polynomials   KEY: addition

110 ANS: 4

$$3y + 2x = 8$$

$$3(-2) + 2(7) = 8$$

$$-6 + 14 = 8$$

PTS: 2   REF: 011218ia   STA: A.A.39   TOP: Identifying Points on a Line

111 ANS: 3   PTS: 2   REF: 011220ia   STA: A.S.6
    TOP: Box-and-Whisker Plots

112 ANS: 4

$$\frac{ey}{n} + k = t$$

$$\frac{ey}{n} = t - k$$

$$y = \frac{n(t - k)}{e}$$

PTS: 2   REF: 011125ia   STA: A.A.23   TOP: Transforming Formulas

113 ANS: 4

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

$$-2x + 10 < 4$$

$$-2x < -6$$

$$x > 3$$

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

114 ANS: 3   PTS: 2   REF: 011117ia   STA: A.G.4
    TOP: Graphing Absolute Value Functions

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

116 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
    KEY: perimeter

117 ANS: 4   PTS: 2   REF: 011102ia   STA: A.G.9
    TOP: Quadratic-Linear Systems

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

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

120 ANS: 3   PTS: 2   REF: 011205ia   STA: A.A.1
    TOP: Expressions

121 ANS: 2

$$x^2 - 2x - 15 = 0$$

$$(x - 5)(x + 3) = 0$$

$$x = 5 \quad x = -3$$
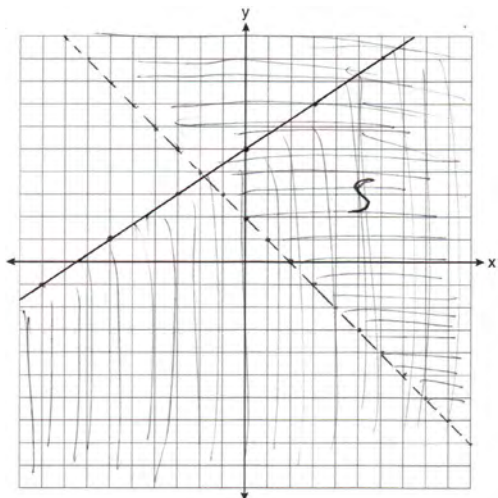
PTS: 2   REF: 011128ia   STA: A.A.28   TOP: Roots of Quadratics

122 ANS:

PTS: 4   REF: 011139ia   STA: A.G.7   TOP: Systems of Linear Inequalities

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

TOP: Transforming Formulas

124 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

125 ANS: 3

$$35000(1 - 0.05)^4 \approx 28507.72$$

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

126 ANS: 4   PTS: 2   REF: 011114ia   STA: A.N.1

TOP: Properties of Reals

127 ANS:

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

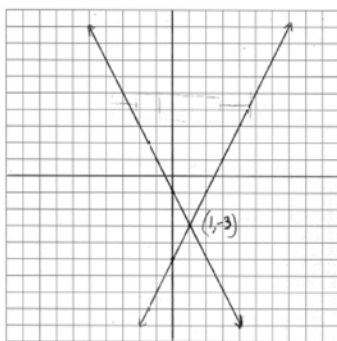PTS: 3   REF: fall0734ia   STA: A.M.1   TOP: Speed

128 ANS:

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

129 ANS:

$4, -5.$ $\dfrac{x+2}{6} = \dfrac{3}{x-1}$

$(x+2)(x-1) = 18$

$x^2 - x + 2x - 2 = 18$

$x^2 + x - 20 = 0$

$(x+5)(x-4) = 0$

$x = -5 \text{ or } 4$

PTS: 3   REF: 011136ia   STA: A.A.26   TOP: Solving Rationals

130 ANS: 1

A rooster crows before sunrise, not because of the sun.

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

131 ANS: 1

$s = \dfrac{2x+t}{r}$

$rs = 2x + t$

$rs - t = 2x$

$\dfrac{rs-t}{2} = x$

PTS: 2   REF: 011228ia   STA: A.A.23   TOP: Transforming Formulas

132 ANS: 2

$m = \dfrac{-A}{B} = \dfrac{-3}{-7} = \dfrac{3}{7}$

PTS: 2   REF: 011122ia   STA: A.A.37   TOP: Slope

133 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

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

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

135 ANS: 1   PTS: 2   REF: 061010ia   STA: A.A.40
TOP: Systems of Linear Inequalities

136 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

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

$$2x - 4 = 48$$

$$x = 26$$
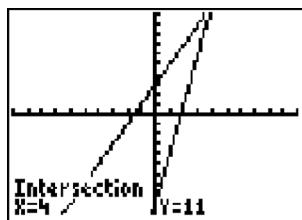
PTS: 2   REF: 080928ia   STA: A.A.6   TOP: Modeling Equations

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

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

139 ANS:

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

$12 = 3g$

$g = 4$

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

140 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

141 ANS:

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

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

142 ANS: 3

$$\tan PLM = \frac{\text{opposite}}{\text{adjacent}} = \frac{4}{3}$$

PTS: 2 REF: 011226ia STA: A.A.42 TOP: Trigonometric Ratios

143 ANS: 3

mean $= 81\frac{7}{11}$, median $= 81$ and mode $= 76$

PTS: 2 REF: 011118ia STA: A.S.4 TOP: Central Tendency

144 ANS:

$y = \frac{3}{4}x + 10$. $y = mx + b$

$\quad\quad\quad 4 = \frac{3}{4}(-8) + b$

$\quad\quad\quad 4 = -6 + b$

$\quad\quad 10 = b$

PTS: 3 REF: 011134ia STA: A.A.34 TOP: Writing Linear Equations

145 ANS: 4

$$m = \frac{-3 - 1}{2 - 5} = \frac{-4}{-3} = \frac{4}{3}$$

PTS: 2 REF: 011215ia STA: A.A.33 TOP: Slope

146 ANS: 2

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

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

147 ANS:

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

PTS: 2   REF: 061031ia   STA: A.M.3   TOP: Error
KEY: volume and surface area

148 ANS:

$$259.99 \times 1.07 - 259.99(1 - 0.3) \times 1.07 = 83.46$$

PTS: 4   REF: 011239ia   STA: A.N.5   TOP: Percents

149 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

150 ANS:
(W,H,A), (W,H,S), (W,T,A), (W,T,S), (W,B,A), (W,B,S), (R,H,A), (R,H,S), (R,T,A), (R,T,S), (R,B,A), (R,B,S).
8, 3

PTS: 4   REF: 011238ia   STA: A.S.19   TOP: Sample Space

151 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

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

153 ANS:

$$2(x - 4) \ge \frac{1}{2}(5 - 3x)$$

$$4(x - 4) \ge 5 - 3x$$

$$4x - 16 \ge 5 - 3x$$

$$7x \ge 21$$

$$x \ge 3$$

PTS: 3   REF: 011234ia   STA: A.A.24   TOP: Solving Inequalities

154 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

155 ANS: 2

$$\sqrt{18.4^2 - 7^2} \approx 17$$

PTS: 2   REF: 011107ia   STA: A.A.45   TOP: Pythagorean Theorem

156 ANS: 1   PTS: 2   REF: 061005ia   STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

157 ANS: 1

$$2(x - 4) = 4(2x + 1)$$

$$2x - 8 = 8x + 4$$

$$-12 = 6x$$

$$-2 = x$$

PTS: 2   REF: 011106ia   STA: A.A.22   TOP: Solving Equations

158 ANS:

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

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

159 ANS: 2

$$\frac{3}{2x} + \frac{7}{4x} = \frac{12x + 14x}{8x^2} = \frac{26x}{8x^2} = \frac{13}{4x}$$

PTS: 2   REF: 011120ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

160 ANS: 4   PTS: 2   REF: fall0730ia   STA: A.G.3

TOP: Defining Functions

161 ANS: 2

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

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

162 ANS: 3   PTS: 2   REF: 011204ia   STA: A.G.3
TOP: Defining Functions

163 ANS: 2   PTS: 2   REF: 011201ia   STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

164 ANS:
7, 9, 11. $x + (x + 2) + (x + 4) = 5(x + 2) - 18$

$$3x + 6 = 5x - 8$$
$$14 = 2x$$
$$7 = x$$

PTS: 4   REF: 011237ia   STA: A.A.6   TOP: Modeling Equations

165 ANS: 2

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

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

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

167 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

168 ANS: 1
$$13.95 + 0.49s \le 50.00$$
$$0.49s \le 36.05$$
$$s \le 73.57$$

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

169 ANS: 3
$$x^2 - 6x = 0$$
$$x(x - 6) = 0$$
$$x = 0 \quad x = 6$$

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

170 ANS: 1

$$\sin x = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{28}{53}$$

PTS: 2   REF: 011109ia   STA: A.A.42   TOP: Trigonometric Ratios
171 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
172 ANS: 2   PTS: 2   REF: 080916ia   STA: A.G.8
TOP: Solving Quadratics by Graphing
173 ANS: 4   PTS: 2   REF: 011222ia   STA: A.A.29
TOP: Set Theory
174 ANS: 3   PTS: 2   REF: fall0710ia   STA: A.A.31
TOP: Set Theory
175 ANS: 1

$$\sqrt{1700^2 - 1300^2} \approx 1095$$

PTS: 2   REF: 011221ia   STA: A.A.45   TOP: Pythagorean Theorem
176 ANS: 1   PTS: 2   REF: 011207ia   STA: A.G.9
TOP: Quadratic-Linear Systems
177 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
178 ANS: 2

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

PTS: 2   REF: fall0718ia   STA: A.A.16   TOP: Rational Expressions
KEY: $a > 0$
179 ANS: 3

$$3\sqrt{2} + \sqrt{8} = 3\sqrt{2} + \sqrt{4}\sqrt{2} = 3\sqrt{2} + 2\sqrt{2} = 5\sqrt{2}$$

PTS: 2   REF: 011121ia   STA: A.N.3   TOP: Operations with Radicals
KEY: addition

21

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

PTS: 2   REF: 011105ia   STA: A.G.3   TOP: Defining Functions

181 ANS: 2

$$\frac{2y}{y+5} + \frac{10}{y+5} = \frac{2y+10}{y+5} = \frac{2(y+5)}{y+5} = 2$$

PTS: 2   REF: 011230ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

182 ANS:

$$\frac{6}{25} \cdot \frac{25-(11+5+3)}{25}$$

PTS: 2   REF: 011232ia   STA: A.S.21   TOP: Experimental Probability

183 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

184 ANS: 1

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

PTS: 2   REF: 011214ia   STA: A.A.15   TOP: Undefined Rationals

185 ANS: 1

$$3x^2 - 27x = 0$$
$$3x(x-9) = 0$$
$$x = 0, 9$$

PTS: 2   REF: 011223ia   STA: A.A.28   TOP: Roots of Quadratics

186 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

187 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
KEY: area

188 ANS: 2   PTS: 2   REF: fall0725ia   STA: A.N.4
TOP: Operations with Scientific Notation

189 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
KEY: division

190 ANS: 1

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

PTS: 2   REF: 011130ia   STA: A.A.16   TOP: Rational Expressions
KEY: $a > 0$

191 ANS: 4   PTS: 2   REF: 011111ia   STA: A.G.8
TOP: Solving Quadratics by Graphing

192 ANS:
$-6a + 42.$ distributive

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

193 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

194 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

195 ANS: 3
$5x + 2y = 48$

$3x + 2y = 32$

$\quad 2x = 16$

$\quad\; x = 8$

PTS: 2   REF: fall0708ia   STA: A.A.10   TOP: Solving Linear Systems

Integrated Algebra Regents at Random
Answer Section

196 ANS: 3

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

$$x \approx 21$$

PTS: 2   REF: 010912ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side
197 ANS: 4   PTS: 2   REF: 081022ia   STA: A.A.29
TOP: Set Theory
198 ANS: 1
$3(2m-1) \le 4m+7$

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

$2m \le 10$

$m \le 5$

PTS: 2   REF: 081002ia   STA: A.A.24   TOP: Solving Inequalities
199 ANS:
$2(x+3)(x-4) + 2(5)(x-4) + 2(x+3)(5)$

$2(x^2 - 4x + 3x - 12) + 10(x-4) + 10(x+3)$

$2x^2 - 2x - 24 + 10x - 40 + 10x + 30$

$2x^2 + 18x - 34$

PTS: 3   REF: 061136ia   STA: A.G.2   TOP: Surface Area
200 ANS:
50. $12 + 10 + 12 + \frac{1}{2}(10\pi) \approx 50$

PTS: 2   REF: 010931ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
KEY: perimeter
201 ANS: 3
$$\frac{2+x}{5x} - \frac{x-2}{5x} = \frac{2+x-x+2}{5x} = \frac{4}{5x}$$

PTS: 2   REF: 081027ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals
202 ANS: 2   PTS: 2   REF: 061115ia   STA: A.S.7
TOP: Scatter Plots

203 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

204 ANS: 4 PTS: 2 REF: 061112ia STA: A.A.36
TOP: Parallel and Perpendicular Lines

205 ANS: 3

$m = \dfrac{6-4}{3-(-2)} = \dfrac{2}{5}$
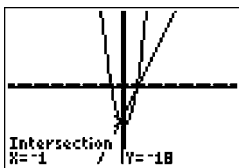
PTS: 2 REF: 061110ia STA: A.A.33 TOP: Slope

206 ANS: 4

$\dfrac{7}{12x} - \dfrac{y}{6x^2} = \dfrac{42x^2 - 12xy}{72x^3} = \dfrac{6x(7x - 2y)}{72x^3} = \dfrac{7x - 2y}{12x^2}$

PTS: 2 REF: 061129ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

207 ANS:

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

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

208 ANS: 2

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

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

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

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

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

209 ANS: 1

$f + m = 53$

$f - m = 25$

$2m = 28$

$m = 14$

PTS: 2 REF: 061126ia STA: A.A.7 TOP: Writing Linear Systems

210 ANS:

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

211 ANS: 2   PTS: 2   REF: 061122ia   STA: A.S.14
TOP: Analysis of Data

212 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

213 ANS: 4
$_5P_5 = 5 \times 4 \times 3 \times 2 \times 1 = 120$

PTS: 2   REF: 061109ia   STA: A.N.8   TOP: Permutations

214 ANS: 2   PTS: 2   REF: 061113ia   STA: A.G.5
TOP: Graphing Quadratic Functions

215 ANS: 4   PTS: 2   REF: 061123ia   STA: A.A.31
TOP: Set Theory

216 ANS:
(1) Distributive; (2) Commutative

PTS: 2   REF: 061132ia   STA: A.N.1   TOP: Identifying Properties

217 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
KEY: area

218 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

219 ANS:
$$\frac{x^2 - 5x - 24}{x - 8} = \frac{(x-8)(x+3)}{x-8} = x+3$$
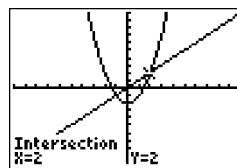
PTS: 2   REF: 061131ia   STA: A.A.16   TOP: Rational Expressions
KEY: $a > 0$

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

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

    PTS: 2   REF: 010932ia   STA: A.A.12   TOP: Division of Powers
222 ANS: 2
    $20000(.88)^3 = 13629.44$

    PTS: 2   REF: 061124ia   STA: A.A.9   TOP: Exponential Functions
223 ANS: 3   PTS: 2   REF: 081008ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares
224 ANS: 4
    $x^2 - 4x - 12 = 0$

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

    $x = 6 \ x = -2$

    PTS: 2   REF: 061125ia   STA: A.A.15   TOP: Undefined Rationals
225 ANS: 3   PTS: 2   REF: 061119ia   STA: A.A.2
    TOP: Expressions
226 ANS: 2   PTS: 2   REF: 061121ia   STA: A.A.3
    TOP: Expressions
227 ANS: 2
    $P = 2l + 2w$

    $P - 2l = 2w$

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

    PTS: 2   REF: 010911ia   STA: A.A.23   TOP: Transforming Formulas
228 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
229 ANS: 3   PTS: 2   REF: 060817ia   STA: A.A.15
    TOP: Undefined Rationals

4

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

231 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

232 ANS: 3
$$_6P_4 = 360$$

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

233 ANS: 3
$$3\sqrt{250} = 3\sqrt{25}\sqrt{10} = 15\sqrt{10}$$

PTS: 2 REF: 061106ia STA: A.N.2 TOP: Simplifying Radicals

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

235 ANS: 4 PTS: 2 REF: 081025ia STA: A.G.4
TOP: Families of Functions

236 ANS: 1 PTS: 2 REF: 060811ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

237 ANS: 2
$$1.5^3 = 3.375$$

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

238 ANS: 2 PTS: 2 REF: 061127ia STA: A.N.4
TOP: Operations with Scientific Notation

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

240 ANS:

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

241 ANS: 2
$$\sin 57 = \frac{x}{8}$$

$$x \approx 6.7$$

PTS: 2 REF: 061108ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

242 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
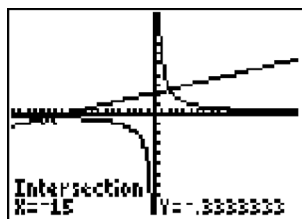
243 ANS: 1　　　　　PTS: 2　　　　REF: 061103ia　　STA: A.A.12

TOP: Division of Powers

244 ANS: 4

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

$x^2 + 13x = 30$

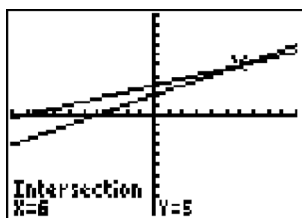$x^2 + 13x - 30 = 0$

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

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

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

245 ANS: 3

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

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

$3k + 12 = 2k + 18$

$k = 6$

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

246 ANS: 3
$$10^2 + 10^2 = c^2$$
$$c^2 = 200$$
$$c \approx 14.1$$

PTS: 2　　　　REF: 061102ia　　　STA: A.A.45　　　TOP: Pythagorean Theorem

247 ANS: 3
$$\sqrt{72} = \sqrt{36}\sqrt{2} = 6\sqrt{2}$$

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

248 ANS: 2
In (2), each element in the domain corresponds to a unique element in the range.

PTS: 2　　　　REF: 061116ia　　　STA: A.G.3　　　TOP: Defining Functions

249 ANS: 2　　　　PTS: 2　　　　REF: 010916ia　　　STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

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

251 ANS: 3
$$x = \frac{-b}{2a} = \frac{-10}{2(-1)} = 5.$$

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

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

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

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

254 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

255 ANS:

$-\dfrac{9}{4}.$ $\qquad \dfrac{3}{4} = \dfrac{-(x+11)}{4x} + \dfrac{1}{2x}$

$\qquad\qquad \dfrac{3}{4} = \dfrac{-x-11}{4x} + \dfrac{2}{4x}$

$\qquad\qquad \dfrac{3}{4} = \dfrac{-x-9}{4x}$

$\qquad\qquad 12x = -4x - 36$

$\qquad\qquad 16x = -36$

$\qquad\qquad x = -\dfrac{9}{4}$

PTS: 4   REF: 061137ia   STA: A.A.26   TOP: Solving Rationals

256 ANS: 3

$P(odd) = \dfrac{3}{6}, P(prime) = \dfrac{3}{6}, P(perfect\ square) = \dfrac{2}{6}, P(even) = \dfrac{3}{6}$

PTS: 2   REF: 061104ia   STA: A.S.22   TOP: Geometric Probability

257 ANS: 2

$\left| \dfrac{55.42 - 50.27}{55.42} \right| \approx 0.093$

PTS: 2   REF: 081023ia   STA: A.M.3   TOP: Error
KEY: area

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

259 ANS: 2

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

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

260 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

261 ANS:

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

PTS: 2   REF: 081031ia   STA: A.A.14   TOP: Division of Polynomials

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

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

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

265 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

266 ANS:
12, 7. Both the median and the mode will increase.

PTS: 3   REF: 061134ia   STA: A.S.16   TOP: Central Tendency

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

268 ANS: 4   PTS: 2   REF: 061111ia   STA: A.G.4
TOP: Families of Functions

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

270 ANS: 1
$$\frac{1}{8} \times \frac{1}{8} = \frac{1}{64}$$

PTS: 2   REF: 010928ia   STA: A.S.23   TOP: Geometric Probability

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

272 ANS:
618.45, 613.44, 0.008. $21.7 \times 28.5 = 618.45$. $21.6 \times 28.4 = 613.44$. $\left| \frac{618.45 - 613.44}{613.44} \right| \approx 0.008$. An error of less than 1% would seem to be insignificant.

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

273 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

274 ANS: 4   PTS: 2   REF: 010929ia   STA: A.S.6
TOP: Box-and-Whisker Plots

275 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

276 ANS: 3   PTS: 2   REF: 060825ia   STA: A.A.45
TOP: Pythagorean Theorem

277 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
KEY: division

278 ANS: 3
$25 - 18 = 7$

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

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

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

280 ANS: 3
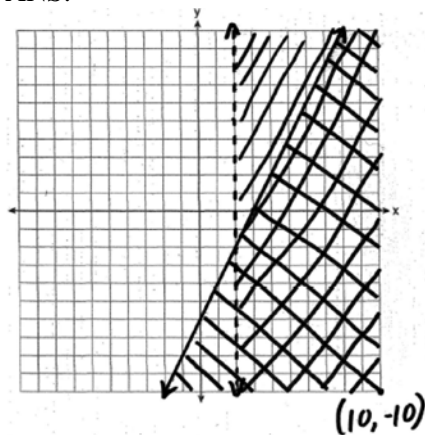$$\frac{(12.3 \times 11.9) - (12.2 \times 11.8)}{12.3 \times 11.9} \approx 0.0165$$

PTS: 2   REF: 061120ia   STA: A.M.3   TOP: Error
KEY: area

281 ANS:

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

10

282 ANS: 2
shaded = whole − unshaded

$\quad\quad$ = rectangle-triangle

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

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

$\quad\quad = 90 - 34.5$

$\quad\quad = 55.5$

$\quad$ PTS: 2 $\quad\quad\quad$ REF: 081019ia $\quad$ STA: A.G.1 $\quad\quad$ TOP: Compositions of Polygons and Circles
$\quad$ KEY: area

283 ANS: 2

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

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

284 ANS: 2 $\quad\quad\quad\quad$ PTS: 2 $\quad\quad\quad$ REF: 061105ia $\quad$ STA: A.A.20
$\quad$ TOP: Factoring Polynomials

285 ANS:
$0.65x + 35 \le 45$

$\quad\quad 0.65x \le 10$

$\quad\quad\quad x \le 15$

$\quad$ PTS: 3 $\quad\quad\quad$ REF: 061135ia $\quad$ STA: A.A.6 $\quad\quad$ TOP: Modeling Inequalities

286 ANS: 3 $\quad\quad\quad\quad$ PTS: 2 $\quad\quad\quad$ REF: 081017a $\quad$ STA: A.S.14
$\quad$ TOP: Analysis of Data

287 ANS: 2

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

$\quad A \approx 42$
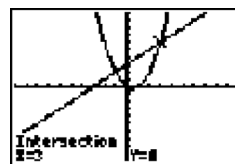
$\quad$ PTS: 2 $\quad\quad\quad$ REF: 060816ia $\quad$ STA: A.A.43 $\quad\quad$ TOP: Using Trigonometry to Find an Angle

288 ANS: 2

$x^2 - x = x + 3$. Since $y = x + 3$, the solutions are $(3,6)$ and $(-1,2)$.

$x^2 - 2x - 3 = 0$

$(x-3)(x+1) = 0$

$x = 3 \text{ or } -1$
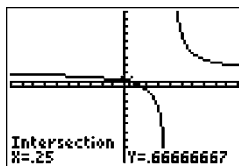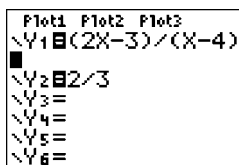
PTS: 2   REF: 061118ia   STA: A.A.11   TOP: Quadratic-Linear Systems

289 ANS: 2

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

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

$6x - 9 = 2x - 8$

$4x = 1$

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

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

290 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

291 ANS: 4

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

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

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

293 ANS: 1
The slope of both is –4.

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

294 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
KEY: area

295 ANS:
$0 \le t \le 40$

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

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

297 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

298 ANS: 2

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

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

299 ANS: 4
$5(x + 4) = 5x + 20$

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

300 ANS:

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

$\qquad 25x = 54,000$

$\qquad\quad x = 2,160$

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

301 ANS: 3   PTS: 2   REF: 010917ia   STA: A.A.29
TOP: Set Theory

302 ANS: 3   PTS: 2   REF: 060808ia   STA: A.N.8
TOP: Permutations

303 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

304 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

305 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

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

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

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

308 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

309 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

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

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

311 ANS:
(T,J,F), (T,J,N), (T,K,F), (T,K,N), (T,C,F), (T,C,N), (B,J,F), (B,J,N), (B,K,F), (B,K,N), (B,C,F), (B,C,N), (S,J,F), (S,J,N), (S,K,F), (S,K,N), (S,C,F), (S,C,N). 3, 12.

PTS: 4   REF: 061138ia   STA: A.S.19   TOP: Sample Space

312 ANS: 2

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

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

313 ANS: 2

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

PTS: 2   REF: 060824ia   STA: A.A.16   TOP: Rational Expressions
KEY: $a > 0$

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

315 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

316 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

317 ANS: 3

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

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

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

$\qquad\quad 3r = 87$

$\qquad\quad r = 29$

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

318 ANS: 3

The other situations are quantitative.

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

319 ANS: 4 PTS: 2 REF: 061130ia STA: A.A.13

TOP: Addition and Subtraction of Polynomials KEY: subtraction

320 ANS: 4

$$\frac{x^2 - 1}{x + 1} \cdot \frac{x + 3}{3x - 3} = \frac{(x+1)(x-1)}{x+1} \cdot \frac{x+3}{3(x-1)} = \frac{x+3}{3}$$
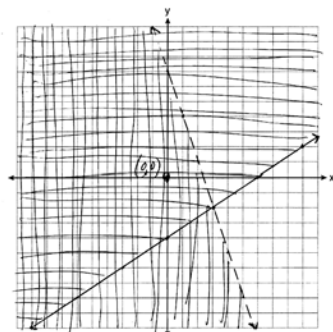
PTS: 2 REF: 060815ia STA: A.A.18 TOP: Multiplication and Division of Rationals

KEY: multiplication

321 ANS:

PTS: 4 REF: 061139ia STA: A.G.7 TOP: Systems of Linear Inequalities

322 ANS:
$$-3\sqrt{48} = -3\sqrt{16}\sqrt{3} = -12\sqrt{3}$$

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

323 ANS: 2
$$m = \frac{5-3}{8-1} = \frac{2}{7} \quad y - y_1 = m(x - x_i)$$
$$y - 5 = \frac{2}{7}(x - 8)$$

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

324 ANS:
$x = 1; \ (1,-5)$

PTS: 2　　　　REF: 061133ia　　　STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

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

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

327 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

328 ANS: 4
$$A = lw = (3w - 7)(w) = 3w^2 - 7w$$

PTS: 2　　　　REF: 010924ia　　　STA: A.A.1　　　　TOP: Expressions

329 ANS: 1　　　PTS: 2　　　　REF: 061114ia　　　STA: A.A.43
TOP: Using Trigonometry to Find an Angle

330 ANS: 2　　　PTS: 2　　　　REF: 061128ia　　　STA: A.A.29
TOP: Set Theory

331 ANS: 2

$$3c + 4m = 12.50$$

$$3c + 2m = 8.50$$

$$2m = 4.00$$

$$m = 2.00$$

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

332 ANS: 3

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

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

333 ANS: 4

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

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

334 ANS: 1

Asking school district employees about a school board candidate produces the most bias.

PTS: 2 REF: 061107ia STA: A.S.3 TOP: Analysis of Data

335 ANS: 3

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

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

336 ANS:

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

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

337 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

338 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

17

339 ANS: 1

$$\frac{12.8 + 17.2}{3 + 5} = 3.75$$

PTS: 2   REF: 061117ia   STA: A.M.1   TOP: Speed

340 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

341 ANS: 3   PTS: 2   REF: 061101ia   STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

342 ANS: 1   PTS: 2   REF: 081030ia   STA: A.A.3

TOP: Expressions

343 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

344 ANS: 4

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

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

345 ANS: 4   PTS: 2   REF: 010927ia   STA: A.N.4

TOP: Operations with Scientific Notation

346 ANS: 1

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

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

$$x = -8$$

PTS: 2   REF: 010918ia   STA: A.A.26   TOP: Solving Rationals

347 ANS:

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

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

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

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

TOP: Defining Functions

349 ANS: 4   PTS: 2   REF: 081011ia   STA: A.A.5

TOP: Modeling Equations

350 ANS: 1   PTS: 2   REF: 081015ia   STA: A.G.5
     TOP: Graphing Quadratic Functions
351 ANS: 4
     $\dfrac{\text{distance}}{\text{time}} = \dfrac{24}{6} = 4$

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

Integrated Algebra Regents at Random
Answer Section

352 ANS: 2   PTS: 2   REF: 081104ia   STA: A.S.14
     TOP: Analysis of Data
353 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
354 ANS: 2

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

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

$$x = 3 \quad x = 2$$

     PTS: 2   REF: 081120ia   STA: A.A.28   TOP: Roots of Quadratics
355 ANS: 3   PTS: 2   REF: 060926ia   STA: A.N.1
     TOP: Properties of Reals
356 ANS: 2   PTS: 2   REF: 081111ia   STA: A.G.10
     TOP: Identifying the Vertex of a Quadratic Given Graph
357 ANS: 2

$$2000(1 + 0.04)^3 \approx 2249$$

     PTS: 2   REF: 081124ia   STA: A.A.9   TOP: Exponential Functions
358 ANS: 3

     mean = 6, median = 6 and mode = 7

     PTS: 2   REF: 080804ia   STA: A.S.4   TOP: Central Tendency
359 ANS: 4   PTS: 2   REF: 060927ia   STA: A.N.4
     TOP: Operations with Scientific Notation
360 ANS:

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

$$A \approx 53$$

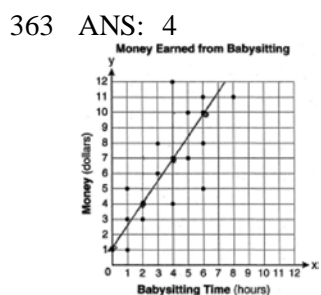   PTS: 2   REF: 011032ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

1

361 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

362 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: Division of Polynomials

363 ANS: 4

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

364 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

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

366 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

367 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

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

369 ANS: 1

$y = mx + b$

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

$b = 6$

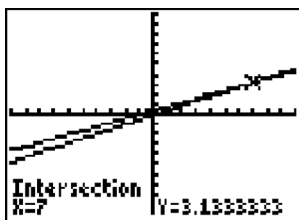   PTS: 2   REF: 060922ia   STA: A.A.34   TOP: Writing Linear Equations

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

371 ANS: 2

$\cos 38 = \dfrac{10}{x}$

$x = \dfrac{10}{\cos 38} \approx 12.69$

    PTS: 2   REF: 081126ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side

372 ANS: 2

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

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

373 ANS: 4

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

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

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

$6x + 5 = 7x - 2$

$x = 7$

    PTS: 2   REF: 080820ia   STA: A.A.25
    TOP: Solving Equations with Fractional Expressions

3

374 ANS: 1

$$y = mx + b$$

$$5 = (-2)(1) + b$$

$$b = 7$$

PTS: 2   REF: 081108ia   STA: A.A.34   TOP: Writing Linear Equations

375 ANS: 3

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{15}{17}$$

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

376 ANS: 4

$$A(-3,4) \text{ and } B(5,8). \quad m = \frac{4-8}{-3-5} = \frac{-4}{-8} = \frac{1}{2}$$
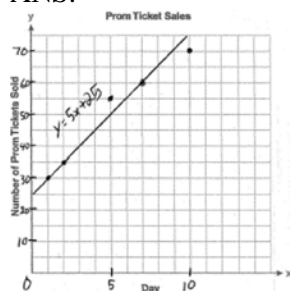
PTS: 2   REF: 011007ia   STA: A.A.33   TOP: Slope

377 ANS:

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

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

TOP: Modeling Inequalities

379 ANS: 1

$$-3(-4)^2(2) + 4(-4) = -96 - 16 = -112$$

PTS: 2   REF: 081113ia   STA: A.N.6   TOP: Evaluating Expressions

380 ANS:

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

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

381 ANS:

41.8. $\sin x = \frac{8}{12}$

$\quad A \approx 41.8$

PTS: 3   REF: 081135ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

382 ANS:

$$77120 + 33500 = 110620 \text{ sq. ft. } \times \frac{1 \text{ acre}}{43560 \text{ sq. ft.}} \approx 2.54 \text{ acres}$$

PTS: 2　　　　REF: 081133ia　　STA: A.M.2　　　TOP: Conversions

383 ANS: 2

$$\left| \frac{13.5 - 12.8}{13.5} \right| \approx 0.093$$

PTS: 2　　　　REF: 081123ia　　STA: A.M.3　　　TOP: Error
KEY: area

384 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

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

386 ANS: 4

$$-3x(x-4) - 2x(x+3) = -3x^2 + 12x - 2x^2 - 6x = -5x^2 + 6x$$

PTS: 2　　　　REF: 081114ia　　STA: A.A.13　　　TOP: Addition and Subtraction of Monomials

387 ANS: 4

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

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

388 ANS: 4　　　　PTS: 2　　　　REF: 060906ia　　STA: A.A.4
TOP: Modeling Inequalities

389 ANS:

$$\frac{4}{12} \times \frac{2}{11} \times \frac{1}{10} = \frac{8}{1320} \quad \frac{6}{12} \times \frac{5}{11} \times \frac{4}{10} + \frac{4}{12} \times \frac{3}{11} \times \frac{2}{10} = \frac{120}{1320} + \frac{24}{1320} = \frac{144}{1320}$$

PTS: 4　　　　REF: 081137ia　　STA: A.S.23　　　TOP: Theoretical Probability
KEY: dependent events

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

391 ANS:

$$-2\sqrt{3} \quad \frac{16\sqrt{21}}{2\sqrt{7}} - 5\sqrt{12} = 8\sqrt{3} - 5\sqrt{4}\sqrt{3} = 8\sqrt{3} - 10\sqrt{3} = -2\sqrt{3}$$

PTS: 3　　　　REF: 081136ia　　STA: A.N.3　　　TOP: Operations with Radicals

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

393 ANS:

$bc + ac = ab$

$c(b + a) = ab$
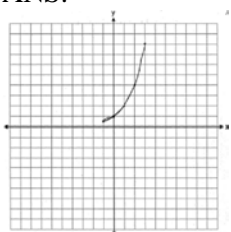
$$c = \frac{ab}{b+a}$$

PTS: 2　　　　REF: 081131ia　　　STA: A.A.23　　　TOP: Transforming Formulas

394 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

395 ANS:

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

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

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

396 ANS: 1　　　　PTS: 2　　　　REF: 011001ia　　　STA: A.S.6

TOP: Box-and-Whisker Plots

397 ANS:

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

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

398 ANS: 2

$L + S = 47$

$L - S = 15$

$\quad 2L = 62$

$\quad\ L = 31$

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

399 ANS: 1

$7 + 8 + 7 + \dfrac{12\pi}{2} = 22 + 6\pi$

PTS: 2　　　　REF: 081128ia　　　STA: A.G.1　　　TOP: Compositions of Polygons and Circles
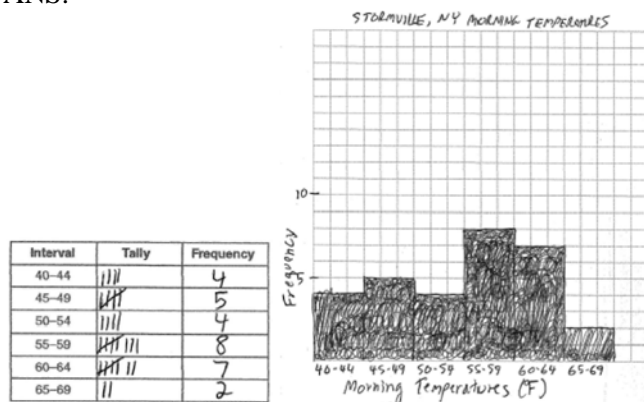
KEY: perimeter

400 ANS: 2　　　　PTS: 2　　　　REF: 080823ia　　　STA: A.A.32

TOP: Slope

401 ANS:

STORMVILLE, NY MORNING TEMPERATURES

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

Frequency

40-44 45-49 50-54 55-59 60-64 65-69
Morning Temperatures (F)

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

402 ANS: 2   PTS: 2   REF: 081127ia   STA: A.A.40
TOP: Systems of Linear Inequalities

403 ANS: 4
In (4), each element in the domain corresponds to a unique element in the range.
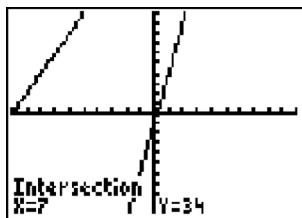
PTS: 2   REF: 011018ia   STA: A.G.3   TOP: Defining Functions

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

405 ANS: 4

$5p - 1 = 2p + 20$

$3p = 21$

$p = 7$

Intersection
X=7   Y=34

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

406 ANS: 3

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

$A \approx 38.7$

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

407 ANS: 1   PTS: 2   REF: 081110ia   STA: A.A.1
TOP: Expressions

408 ANS: 1

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

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

$$4x < 36$$

$$x < 9$$

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

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

410 ANS:
60. $_5P_3 = 60$

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

411 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
KEY: multiplication

412 ANS: 3
Frequency is not a variable.

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

413 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

414 ANS: 2

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

$$x = 300$$

PTS: 2 REF: 080807ia STA: A.G.4 TOP: Graphing Linear Functions

415 ANS: 2
$$\sqrt{32} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$$

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

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

417 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

418 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

419 ANS: 4

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

$$5x = 360$$

$$x = 72$$

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

420 ANS: 3 PTS: 2 REF: 081117ia STA: A.A.29
TOP: Set Theory

421 ANS: 3

$$0.75 \text{ hours} = 45 \text{ minutes.} \quad \frac{120}{1} = \frac{x}{45}$$
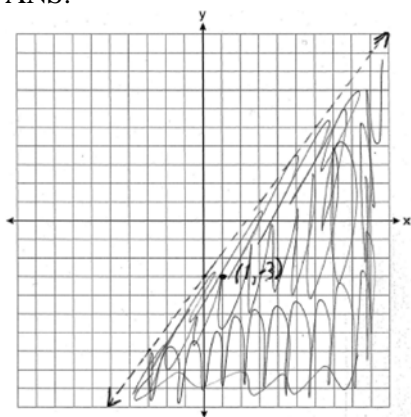
$$x = 5400$$

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

422 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

9

423 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: $a > 0$

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

425 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
KEY: volume and surface area

426 ANS: 1

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

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

427 ANS: 3 PTS: 2 REF: 081103ia STA: A.A.30
TOP: Set Theory

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

429 ANS: 1 PTS: 2 REF: 081115ia STA: A.A.32
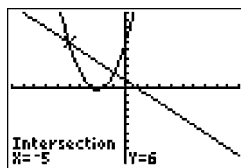TOP: Slope

430 ANS:

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

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

431 ANS: 2

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

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

$(x + 5)(x + 1) = 0$ $= 6$

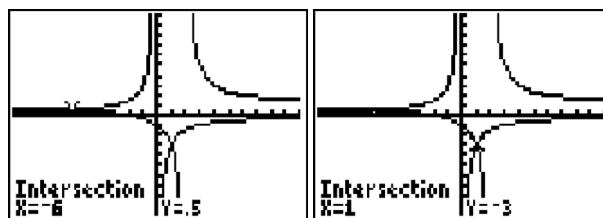$x = -5 \text{ or } -1$

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

432 ANS: 4

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

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

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

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

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

$x = -6 \text{ or } 1$
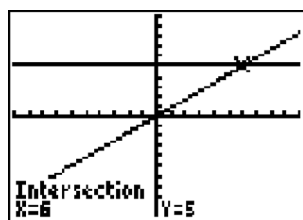
PTS: 2   REF: 011028ia   STA: A.A.26   TOP: Solving Rationals

433 ANS: 1

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

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

$15x = 90$

$x = 6$

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

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

435 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

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

PTS: 2   REF: 060929ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

437 ANS: 3
$P(O) = \dfrac{5}{10}, P(P) = \dfrac{4}{10}, P(\leq 5) = \dfrac{6}{10}, P(/3) = \dfrac{4}{10}$

PTS: 2   REF: 081125ia   STA: A.S.22   TOP: Theoretical Probability

438 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

439 ANS: 2
$36x^2 - 100y^6 = 4(9x^2 - 25y^6) = 4(3x + 5y^3)(3x - 5y^3)$

PTS: 2   REF: 081129ia   STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

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

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

442 ANS: 4
$\dfrac{150}{20} = \dfrac{x}{30}$

$20x = 4500$

$x = 225$

PTS: 2   REF: 081101ia   STA: A.N.5   TOP: Direct Variation

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

444 ANS:
81.3, 80, both increase

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

445 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

446 ANS: 4   PTS: 2   REF: 011025ia   STA: A.A.17
TOP: Addition and Subtraction of Rationals

447 ANS: 1   PTS: 2   REF: 080824ia   STA: A.A.43
TOP: Using Trigonometry to Find an Angle

448 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

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

PTS: 2   REF: 011009ia   STA: A.A.22   TOP: Solving Equations

450 ANS: 2   PTS: 2   REF: 081106ia   STA: A.S.6
TOP: Box-and-Whisker Plots

451 ANS: 1
$_4P_4 = 4 \times 3 \times 2 \times 1 = 24$
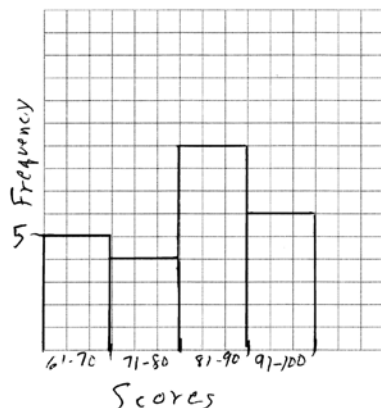
PTS: 2   REF: 080816ia   STA: A.N.8   TOP: Permutations

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

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

453 ANS: 3   PTS: 2   REF: 060919ia   STA: A.G.3
TOP: Defining Functions

454 ANS:

PTS: 2   REF: 081132ia   STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables   KEY: frequency histograms

455 ANS: 3
$V = \pi r^2 h = \pi \cdot 5^2 \cdot 2.3 \approx 180.6$

PTS: 2   REF: 081105ia   STA: A.G.2   TOP: Volume

456 ANS: 4

$-4x + 2 > 10$

$-4x > 8$

$x < -2$

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

457 ANS: 3

$3ax + b = c$

$3ax = c - b$

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

PTS: 2   REF: 080808ia   STA: A.A.23   TOP: Transforming Formulas

458 ANS: 1   PTS: 2   REF: 080813ia   STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

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

TOP: Graphing Absolute Value Functions

460 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

461 ANS: 2

$\tan ABC = \dfrac{\text{opposite}}{\text{adjacent}} = \dfrac{5}{12}$

PTS: 2   REF: 081112ia   STA: A.A.42   TOP: Trigonometric Ratios

462 ANS: 4

$-6x - 17 \geq 8x + 25$

$-42 \geq 14x$

$-3 \geq x$

PTS: 2   REF: 081121ia   STA: A.A.24   TOP: Solving Inequalities

463 ANS: 3

$2x - 5y = 11 \quad 2x - 5(-1) = 11$

$-2x + 3y = -9 \qquad 2x = 6$

$-2y = 2 \qquad\quad x = 3$

$y = -1$

PTS: 2   REF: 081109ia   STA: A.A.10   TOP: Solving Linear Systems

464 ANS: 3
The other situations are quantitative.

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

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

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

$$b = 2$$

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

466 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

467 ANS:
{1,2,4,5,9,10,12}

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

468 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

469 ANS: 1 PTS: 2 REF: 060903ia STA: A.A.12
TOP: Division of Powers

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

$x - y = 3$

$3y = 6$

$y = 2$

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

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

472 ANS: 4
$16^2 + b^2 = 34^2$
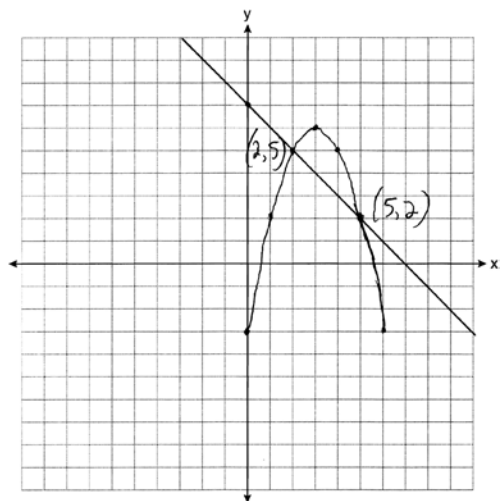
$b^2 = 900$

$b = 30$

PTS: 2 REF: 080809ia STA: A.A.45 TOP: Pythagorean Theorem

473 ANS: 4　　　　　　PTS: 2　　　　　REF: 081107ia　　　STA: A.A.5
　　　TOP: Modeling Inequalities

474 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: Geometric Probability

475 ANS: 1　　　　　　PTS: 2　　　　　REF: 081102ia　　　STA: A.S.12
　　　TOP: Scatter Plots

476 ANS:

　　　PTS: 4　　　　　REF: 081138ia　　　STA: A.G.9　　　　TOP: Quadratic-Linear Systems

477 ANS: 2
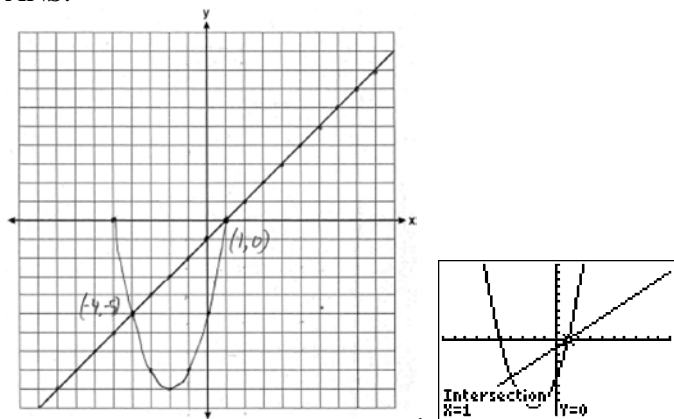$$l(l - 3) = 40$$
$$l^2 - 3l - 40 = 0$$
$$(l - 8)(l + 5) = 0$$
$$l = 8$$

　　　PTS: 2　　　　　REF: 081116ia　　　STA: A.A.8　　　　TOP: Geometric Applications of Quadratics

478 ANS: 2
$R = 0.5^{d-1}$

　　　PTS: 2　　　　　REF: 011006ia　　　STA: A.A.9　　　　TOP: Exponential Functions

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

480 ANS:

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

481 ANS:

56. If the circumference of circle O is $16ð$ 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
KEY: area

482 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

483 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

484 ANS: 1

$b = 2j + 4$ $2j + 4 = 31 - j$

$b + j = 31$ $3j = 27$

$b = 31 - j$ $j = 9$

PTS: 2   REF: 081119ia   STA: A.A.7   TOP: Writing Linear Systems

485 ANS: 3   PTS: 2   REF: 081118ia   STA: A.G.4
TOP: Families of Functions

486 ANS:

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

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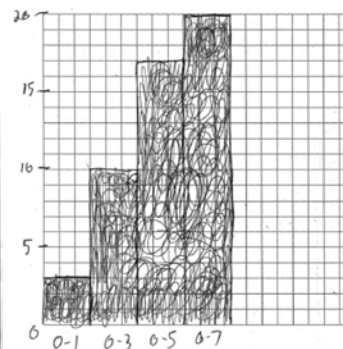$$m = \$0.50$$

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

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

488 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   KEY: cumulative frequency histograms

489 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
KEY: volume and surface area

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

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

492 ANS: 4

$$\frac{x}{x+4} \div \frac{2x}{x^2 - 16} = \frac{x}{x+4} \cdot \frac{x^2 - 16}{2x} = \frac{1}{x+4} \cdot \frac{(x+4)(x-4)}{2} = \frac{x-4}{2}$$

PTS: 2   REF: 081130ia   STA: A.A.18   TOP: Multiplication and Division of Rationals
KEY: division

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

494 ANS: 1

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

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

495 ANS: 1

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

$$7f + 10 = 1424$$

$$f = 202$$

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

496 ANS: 3   PTS: 2   REF: 060924ia   STA: A.G.8
TOP: Solving Quadratics by Graphing

497 ANS: 2   PTS: 2   REF: 011015ia   STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

498 ANS:

$$\frac{m}{5} + \frac{3(m-1)}{2} = 2(m-3)$$

$$\frac{2m}{10} + \frac{15(m-1)}{10} = 2m - 6$$

$$\frac{17m - 15}{10} = 2m - 6$$

$$17m - 15 = 20m - 60$$

$$45 = 3m$$

$$15 = m$$

PTS: 4   REF: 081139ia   STA: A.A.25
TOP: Solving Equations with Fractional Expressions

499 ANS: 1

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

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

500 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

501 ANS: 1

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

PTS: 2   REF: 080828ia   STA: A.M.3   TOP: Error
KEY: volume and surface area

502 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

503 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

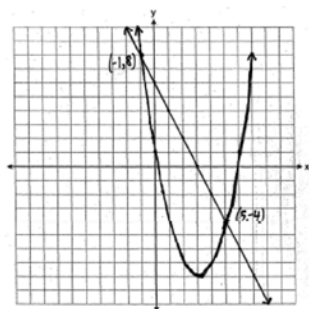504 ANS: 4   PTS: 2   REF: 011016ia   STA: A.A.23

TOP: Transforming Formulas

505 ANS:

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

506 ANS: 4

The other situations are quantitative.
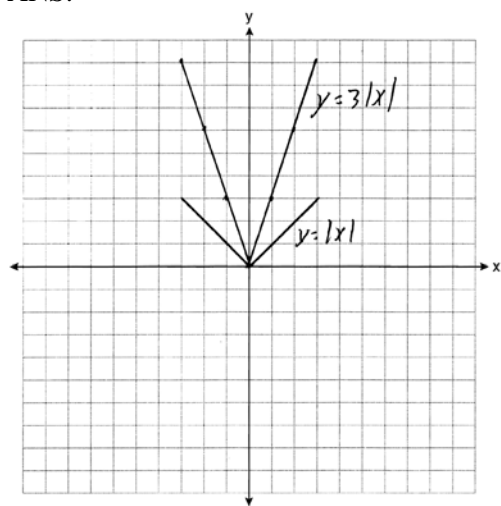
PTS: 2   REF: 081122ia   STA: A.S.1   TOP: Analysis of Data

507 ANS:

The graph becomes steeper.

PTS: 3   REF: 081134ia   STA: A.G.5   TOP: Graphing Absolute Value Functions