

# JEFFERSON MATH PROJECT

## REGENTS BY DATE

The NY Integrated Algebra Regents Exams  
Fall, 2007-August, 2011  
(Answer Key)

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Dear Sir

I have to acknowledge the receipt 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 indispensable 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.**

## fall07ia

## Answer Section

- 1 ANS: 2                   PTS: 2                   REF: fall0701ia      STA: A.S.7  
TOP: Scatter Plots
- 2 ANS: 3                   PTS: 2                   REF: fall0702ia      STA: A.S.23  
TOP: Theoretical Probability      KEY: mutually exclusive events
- 3 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
- 4 ANS: 4                   PTS: 2                   REF: fall0704ia      STA: A.A.29  
TOP: Set Theory
- 5 ANS: 3                   PTS: 2                   REF: fall0705ia      STA: A.N.1  
TOP: Identifying Properties
- 6 ANS: 3                   PTS: 2                   REF: fall0706ia      STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 7 ANS: 1  
A rooster crows before sunrise, not because of the sun.
- PTS: 2                   REF: fall0707ia      STA: A.S.14      TOP: Analysis of Data
- 8 ANS: 3  
 $5x + 2y = 48$   
 $3x + 2y = 32$   
 $2x = 16$   
 $x = 8$
- PTS: 2                   REF: fall0708ia      STA: A.A.7      TOP: Writing Linear Systems
- 9 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
- 10 ANS: 3                   PTS: 2                   REF: fall0710ia      STA: A.A.31  
TOP: Set Theory
- 11 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

12 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

13 ANS: 1

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

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

14 ANS: 2

The two values are shoe size and height.

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

15 ANS: 4

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

16 ANS: 3

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

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

17 ANS: 4

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

18 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.14 TOP: Rational Expressions

19 ANS: 3

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

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

20 ANS: 2

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

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

21 ANS: 1

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

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

22 ANS: 4

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

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

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

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

PTS: 2                      REF: fall0724ia                      STA: A.A.21                      TOP: Interpreting Solutions  
25 ANS: 2                      PTS: 2                      REF: fall0725ia                      STA: A.N.4  
TOP: Operations with Scientific Notation

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

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

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

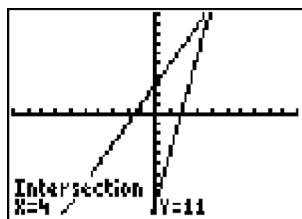
PTS: 2                      REF: fall0727ia                      STA: A.A.17                      TOP: Addition and Subtraction of Rationals  
28 ANS: 1                      PTS: 2                      REF: fall0728ia                      STA: A.A.15  
TOP: Undefined Rationals

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

30 ANS: 4                      PTS: 2                      REF: fall0730ia                      STA: A.G.3  
TOP: Defining Functions

31 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  
32 ANS:



4.  $3 + 2g = 5g - 9$   
 $12 = 3g$   
 $g = 4$

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

33 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

34 ANS:

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

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

35 ANS:

7.  $15x + 22 \geq 120$

$$x \geq 6.\bar{53}$$

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

36 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

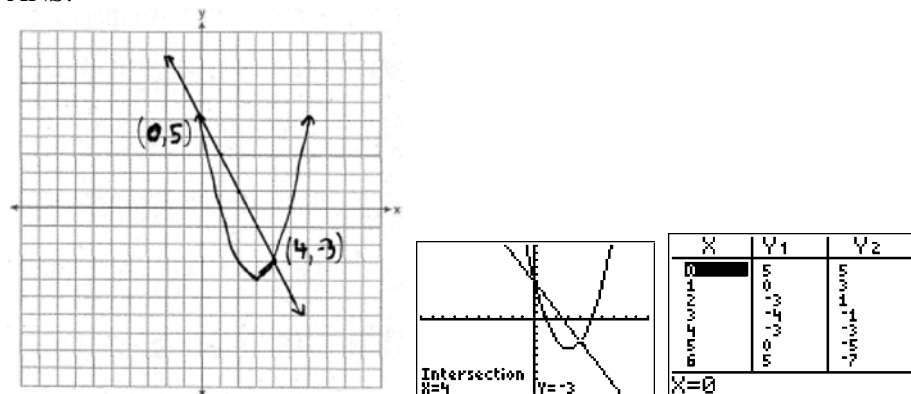
37 ANS:

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

38 ANS:



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

39 ANS:

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

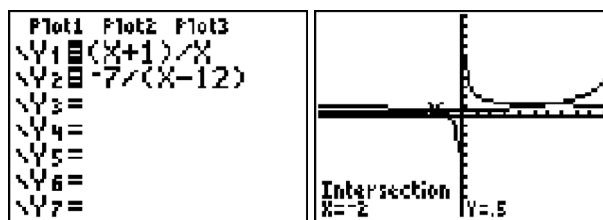
$$(x+1)(x-12) = -7x$$

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

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

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

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



PTS: 4

REF: fall0739ia

STA: A.A.26

TOP: Solving Rationals

## 0608ia

## Answer Section

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

2 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: Theoretical Probability

3 ANS: 1

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

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

4 ANS: 1 PTS: 2 REF: 060804ia STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

5 ANS: 4 PTS: 2 REF: 060805ia STA: A.S.12

TOP: Scatter Plots

6 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

7 ANS: 1 PTS: 2 REF: 060807ia STA: A.A.13

TOP: Multiplication of Polynomials

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

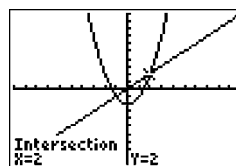
TOP: Permutations

9 ANS: 2

$$1.5^3 = 3.375$$

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

10 ANS: 4



$$x^2 - 2 = x \quad \text{Since } y = x, \text{ the solutions are } (2, 2) \text{ and } (-1, -1).$$

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

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

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

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

- 11 ANS: 1                   PTS: 2                   REF: 060811ia           STA: A.G.10  
TOP: Identifying the Vertex of a Quadratic Given Graph
- 12 ANS: 3  
 $b = 42 - r$     $r = 2b + 3$   
 $r = 2b + 3$     $r = 2(42 - r) + 3$   
 $r = 84 - 2r + 3$   
 $3r = 87$   
 $r = 29$
- PTS: 2                   REF: 060812ia           STA: A.A.7           TOP: Writing Linear Systems
- 13 ANS: 4  
 $\frac{2^6}{2^1} = 2^5$
- PTS: 2                   REF: 060813ia           STA: A.A.12           TOP: Division of Powers
- 14 ANS: 1  
The slope of both is  $-4$ .
- PTS: 2                   REF: 060814ia           STA: A.A.38           TOP: Parallel and Perpendicular Lines
- 15 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
- 16 ANS: 2  
 $\sin A = \frac{8}{12}$   
 $A \approx 42$
- PTS: 2                   REF: 060816ia           STA: A.A.43           TOP: Using Trigonometry to Find an Angle
- 17 ANS: 3                   PTS: 2                   REF: 060817ia           STA: A.A.15  
TOP: Undefined Rationals
- 18 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
- 19 ANS: 3  
The other situations are quantitative.
- PTS: 2                   REF: 060819ia           STA: A.S.1           TOP: Analysis of Data



20 ANS: 3

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

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

21 ANS: 2 PTS: 2 REF: 060821ia STA: A.A.5  
TOP: Modeling Inequalities22 ANS: 3  
 $25 - 18 = 7$ PTS: 2 REF: 060822ia STA: A.S.9  
TOP: Frequency Histograms, Bar Graphs and Tables23 ANS: 4  
 $25(x - 3) = 25x - 75$ 

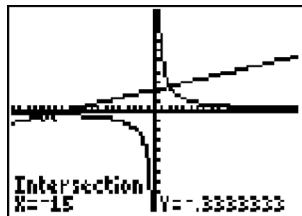
PTS: 2 REF: 060823ia STA: A.A.1 TOP: Expressions

24 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

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

26 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

27 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

28 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

29 ANS: 4 PTS: 2 REF: 060829ia STA: A.G.5  
TOP: Graphing Quadratic Functions30 ANS: 2 PTS: 2 REF: 060830ia STA: A.A.9  
TOP: Exponential Functions

31 ANS:

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

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

32 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

33 ANS:  
 $0 \leq t \leq 40$ 

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

34 ANS:

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

$$d \geq 32.5$$

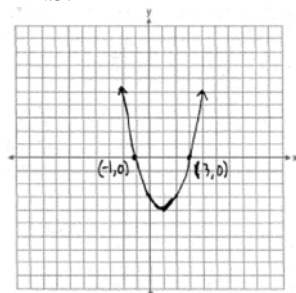
PTS: 3 REF: 060834ia STA: A.A.6 TOP: Modeling Inequalities

35 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

36 ANS:



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

37 ANS:

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

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

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

$$w = 3$$

PTS: 4

REF: 060837ia

STA: A.A.8

TOP: Geometric Applications of Quadratics

38 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

39 ANS:

315,000, 180,000, the median better represents value since it is closer to more prices than the mean.

PTS: 4

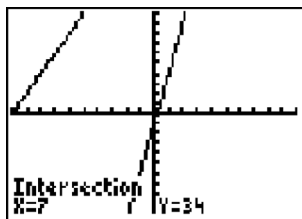
REF: 060839ia

STA: A.S.4

TOP: Frequency Histograms, Bar Graphs and Tables

**0808ia**  
**Answer Section**

1 ANS: 4



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

$$3p = 21$$

$$p = 7$$

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

2 ANS: 2 PTS: 2 REF: 080802ia STA: A.N.1  
TOP: Identifying Properties3 ANS: 1 PTS: 2 REF: 080803ia STA: A.A.4  
TOP: Modeling Inequalities4 ANS: 3  
mean = 6, median = 6 and mode = 7

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

5 ANS: 4  
 $-4x + 2 > 10$   
 $-4x > 8$   
 $x < -2$ 

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

6 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

7 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

8 ANS: 3

$$3ax + b = c$$

$$3ax = c - b$$

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

PTS: 2

REF: 080808ia

STA: A.A.23

TOP: Transforming Formulas

9 ANS: 4

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

$$b^2 = 900$$

$$b = 30$$

PTS: 2

REF: 080809ia

STA: A.A.45

TOP: Pythagorean Theorem

10 ANS: 2

PTS: 2

REF: 080810ia

STA: A.A.36

TOP: Parallel and Perpendicular Lines

11 ANS: 2

$$s + o = 126, s + 2s = 126$$

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

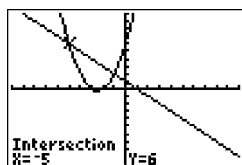
PTS: 2

REF: 080811ia

STA: A.A.7

TOP: Writing Linear Systems

12 ANS: 2



$$x^2 + 5x + 6 = -x + 1, \quad y = -x + 1$$

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

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

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

PTS: 2

REF: 080812ia

STA: A.A.11

TOP: Quadratic-Linear Systems

13 ANS: 1

PTS: 2

REF: 080813ia

STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

14 ANS: 3

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

$$x = 5400$$

PTS: 2

REF: 080814ia

STA: A.M.1

TOP: Using Rate

15 ANS: 2

PTS: 2

REF: 080815ia

STA: A.G.1

TOP: Compositions of Polygons and Circles

16 ANS: 1

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

PTS: 2

REF: 080816ia

STA: A.N.8

TOP: Permutations

17 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

18 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

19 ANS: 3

PTS: 2

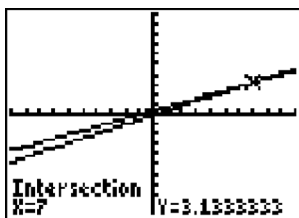
REF: 080819ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

20 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

21 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:  $a > 0$

22 ANS: 4



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

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

TOP: Slope

24 ANS: 1 PTS: 2 REF: 080824ia STA: A.A.43

TOP: Using Trigonometry to Find an Angle

25 ANS: 4 PTS: 2 REF: 080825ia STA: A.A.40

TOP: Systems of Linear Inequalities

26 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

27 ANS: 4 PTS: 2 REF: 080827ia STA: A.A.12

TOP: Powers of Powers

28 ANS: 1

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

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

29 ANS: 3

$$\sin A = \frac{10}{16} \quad B = 180 - (90 + 38.7) = 51.3. \quad \text{A } 90^\circ \text{ angle is not acute.}$$

$$A \approx 38.7$$

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

30 ANS: 2

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

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

PTS: 2 REF: 080830ia STA: A.S.23 TOP: Theoretical Probability

KEY: not mutually exclusive events

31 ANS:

$$111.25 \cdot \frac{\text{distance}}{\text{time}} = \frac{89}{0.8} = 111.25$$

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

32 ANS:

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

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

33 ANS:

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

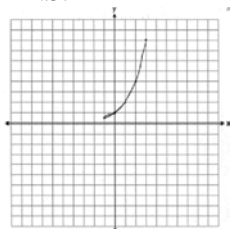
PTS: 2 REF: 080833ia STA: A.A.30 TOP: Set Theory

34 ANS:

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

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

35 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

36 ANS:

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

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

$$b = 2$$

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

37 ANS:

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

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

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

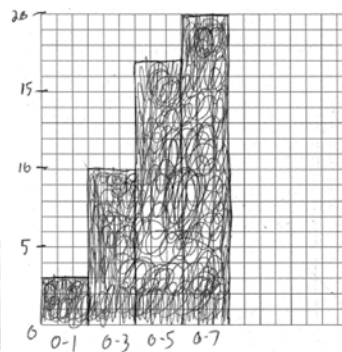
$$m = \$0.50$$

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



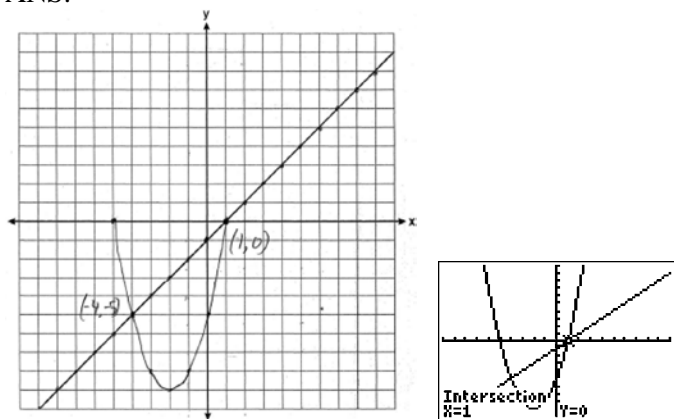
38 ANS:

Number of Days Outside			Number of Days Outside	
Interval	Tally	Frequency	Interval	Cumulative Frequency
0-1		3	0-1	3
2-3		7	0-3	10
4-5		7	0-5	17
6-7		3	0-7	20



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

39 ANS:



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

## 0109ia

## Answer Section

1 ANS: 3

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

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

2 ANS: 4

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

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

3 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

4 ANS: 1

$$0.07m + 19 \leq 29.50$$

$$0.07m \leq 10.50$$

$$m \leq 150$$

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

5 ANS: 1

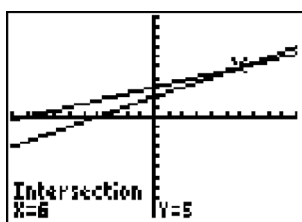
PTS: 2

REF: 010905ia

STA: A.G.4

TOP: Families of Functions

6 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

7 ANS: 4

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

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

8 ANS: 4

PTS: 2

REF: 010908ia

STA: A.A.9

TOP: Exponential Functions

- 9 ANS: 2                   PTS: 2                   REF: 010909ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 10 ANS: 3                   PTS: 2                   REF: 010910ia           STA: A.A.35  
TOP: Writing Linear Equations
- 11 ANS: 2  
 $P = 2l + 2w$   
 $P - 2l = 2w$   
 $\frac{P - 2l}{2} = w$
- PTS: 2                   REF: 010911ia           STA: A.A.23           TOP: Transforming Formulas
- 12 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
- 13 ANS: 2  
 $m = \frac{5-3}{2-7} = -\frac{2}{5}$
- PTS: 2                   REF: 010913ia           STA: A.A.33           TOP: Slope
- 14 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
- 15 ANS: 2                   PTS: 2                   REF: 010915ia           STA: A.A.5  
TOP: Modeling Equations
- 16 ANS: 2                   PTS: 2                   REF: 010916ia           STA: A.G.10  
TOP: Identifying the Vertex of a Quadratic Given Graph
- 17 ANS: 3                   PTS: 2                   REF: 010917ia           STA: A.A.29  
TOP: Set Theory
- 18 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

19 ANS: 2

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

PTS: 2

REF: 010919ia

STA: A.A.42

TOP: Trigonometric Ratios

20 ANS: 3

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

PTS: 2

REF: 010920ia

STA: A.N.2

TOP: Simplifying Radicals

21 ANS: 2

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

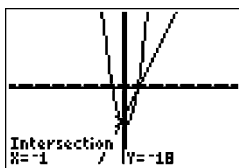
PTS: 2

REF: 010921ia

STA: A.A.17

TOP: Addition and Subtraction of Rationals

22 ANS: 2



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

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

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

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

PTS: 2

REF: 010922ia

STA: A.A.11

TOP: Quadratic-Linear Systems

23 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

24 ANS: 4

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

PTS: 2

REF: 010924ia

STA: A.A.1

TOP: Expressions

25 ANS: 2

PTS: 2

REF: 010925ia

STA: A.A.15

TOP: Undefined Rationals

26 ANS: 1

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

PTS: 2

REF: 010926ia

STA: A.A.38

TOP: Parallel and Perpendicular Lines

27 ANS: 4

PTS: 2

REF: 010927ia

STA: A.N.4

TOP: Operations with Scientific Notation

28 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

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

TOP: Box-and-Whisker Plots

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

TOP: Defining Functions

31 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

32 ANS:

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

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

33 ANS:

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

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

34 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

35 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

36 ANS:

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

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

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

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

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

37 ANS:

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

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

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

$$x = -2$$

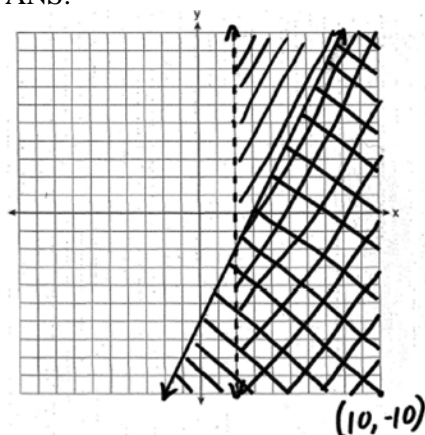
PTS: 4

REF: 010937ia

STA: A.A.10

TOP: Solving Linear Systems

38 ANS:



PTS: 4

REF: 010938ia

STA: A.G.7

TOP: Systems of Linear Inequalities

39 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

**0609ia**  
**Answer Section**

1 ANS: 4

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

$$5x = 360$$

$$x = 72$$

PTS: 2

REF: 060901ia

STA: A.M.1

TOP: Speed

2 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

3 ANS: 1

PTS: 2

REF: 060903ia

STA: A.A.12

TOP: Division of Powers

4 ANS: 2

PTS: 2

REF: 060904ia

STA: A.A.1

TOP: Expressions

5 ANS: 3

The other situations are quantitative.

PTS: 2

REF: 060905ia

STA: A.S.1

TOP: Analysis of Data

6 ANS: 4

PTS: 2

REF: 060906ia

STA: A.A.4

TOP: Modeling Inequalities

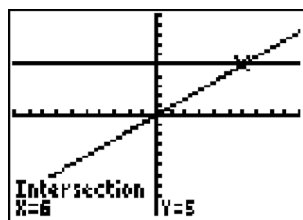
7 ANS: 1

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

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

$$15x = 90$$

$$x = 6$$



PTS: 2

REF: 060907ia

STA: A.A.25

TOP: Solving Equations with Fractional Expressions

8 ANS: 2

PTS: 2

REF: 060908ia

STA: A.S.21

TOP: Empirical Probability

9 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

10 ANS: 2

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

PTS: 2

REF: 060910ia

STA: A.N.2

TOP: Simplifying Radicals

11 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

12 ANS: 2

$$L + S = 47$$

$$L - S = 15$$

$$2L = 62$$

$$L = 31$$

PTS: 2

REF: 060912ia

STA: A.A.7

TOP: Writing Linear Systems

13 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

14 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

15 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



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

17 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

18 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

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

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

21 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:  $a > 0$

22 ANS: 1

$$y = mx + b$$

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

$$b = 6$$

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

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

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

25 ANS: 2

$$x + 2y = 9$$

$$x - y = 3$$

$$3y = 6$$

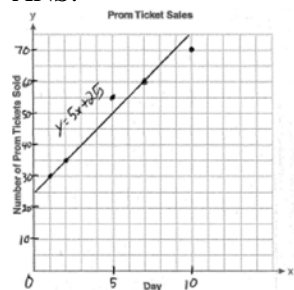
$$y = 2$$

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

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

- 27 ANS: 4                    PTS: 2                    REF: 060927ia            STA: A.N.4  
TOP: Operations with Scientific Notation
- 28 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
- 29 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
- 30 ANS: 4                    PTS: 2                    REF: 060930ia            STA: A.A.29  
TOP: Set Theory
- 31 ANS:  
 $60. {}_5P_3 = 60$
- PTS: 2                    REF: 060931ia            STA: A.N.8            TOP: Permutations
- 32 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
- 33 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
- 34 ANS:  
56. If the circumference of circle  $O$  is  $16\pi$  inches, the diameter,  $\overline{AD}$ , is 16 inches and the length of  $\overline{BC}$  is 12 inches  $\frac{3}{4} \times 16$ . The area of trapezoid  $ABCD$  is  $\frac{1}{2} \times 4(12 + 16) = 56$ .
- PTS: 3                    REF: 060934ia            STA: A.G.1            TOP: Compositions of Polygons and Circles
- 35 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

36 ANS:



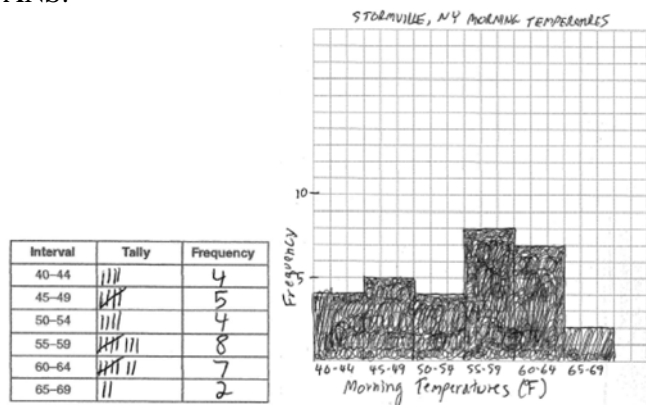
PTS: 3 REF: 060936ia STA: A.S.8 TOP: Scatter Plots

37 ANS:

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

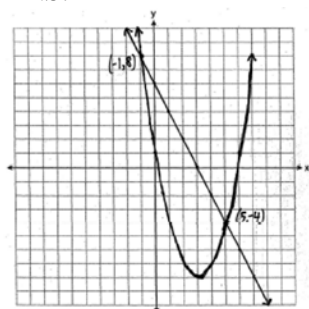
PTS: 4 REF: 060937ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

38 ANS:



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

39 ANS:



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

**0809ia**  
**Answer Section**

- 1 ANS: 2                   PTS: 2                   REF: 080901ia           STA: A.A.4  
TOP: Modeling Equations
- 2 ANS: 1                   PTS: 2                   REF: 080902ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 3 ANS: 4                   PTS: 2                   REF: 080903ia           STA: A.A.12  
TOP: Multiplication of Powers
- 4 ANS: 1  
 $13.95 + 0.49s \leq 50.00$   
 $0.49s \leq 36.05$   
 $s \leq 73.57$
- PTS: 2                   REF: 080904ia           STA: A.A.6           TOP: Modeling Inequalities
- 5 ANS: 3  
 $(3 - 1) \times 2 \times 3 = 12$
- PTS: 2                   REF: 080905ia           STA: A.N.7           TOP: Conditional Probability
- 6 ANS: 1  
 $8^2 + 15^2 = c^2$   
 $c^2 = 289$   
 $c = 17$
- PTS: 2                   REF: 080906ia           STA: A.A.45           TOP: Pythagorean Theorem
- 7 ANS: 3                   PTS: 2                   REF: 080907ia           STA: A.S.20  
TOP: Theoretical Probability
- 8 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
- 9 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

- 10 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
- 11 ANS: 1 PTS: 2 REF: 080911ia STA: A.A.36  
TOP: Parallel and Perpendicular Lines
- 12 ANS: 4  
 $A = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$
- PTS: 2 REF: 080912ia STA: A.A.30 TOP: Set Theory
- 13 ANS: 4  
 $-2(x - 5) < 4$   
 $-2x + 10 < 4$   
 $-2x < -6$   
 $x > 3$
- PTS: 2 REF: 080913ia STA: A.A.21 TOP: Interpreting Solutions
- 14 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
- 15 ANS: 1  
 $m = \frac{4 - (-4)}{-5 - 15} = -\frac{2}{5}$
- PTS: 2 REF: 080915ia STA: A.A.33 TOP: Slope
- 16 ANS: 2 PTS: 2 REF: 080916ia STA: A.G.8  
TOP: Solving Quadratics by Graphing
- 17 ANS: 2  
 $\frac{2}{3x} + \frac{4}{3x} = \frac{9x + 8x}{6x^2} = \frac{17x}{6x^2} = \frac{17}{6x}$
- PTS: 2 REF: 080917ia STA: A.A.17 TOP: Addition and Subtraction of Rationals
- 18 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

19 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

20 ANS: 1

$$x - 2y = 1$$

$$x + 4y = 7$$

$$-6y = -6$$

$$y = 1$$

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

21 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

22 ANS: 2

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

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

23 ANS: 3

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

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

24 ANS: 1

PTS: 2

REF: 080924ia

STA: A.G.1

TOP: Compositions of Polygons and Circles

25 ANS: 3

PTS: 2

REF: 080925ia

STA: A.G.4

TOP: Identifying the Equation of a Graph

26 ANS: 2

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

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

27 ANS: 4

$$y = mx + b$$

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

$$b = -7$$

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

28 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

29 ANS: 3

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

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

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

TOP: Scatter Plots

31 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

32 ANS:

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

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

33 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

34 ANS:

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

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

PTS: 3 REF: 080934ia STA: A.A.41

TOP: Identifying the Vertex of a Quadratic Given Equation

35 ANS:

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

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

36 ANS:

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

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

37 ANS:

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

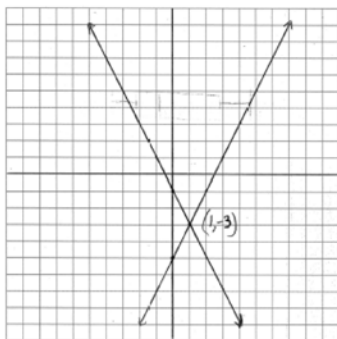
PTS: 4

REF: 080937ia

STA: A.A.18

TOP: Multiplication and Division of Rationals

38 ANS:



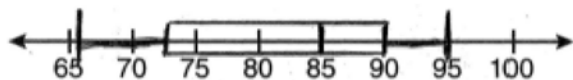
PTS: 4

REF: 080938ia

STA: A.G.7

TOP: Solving Linear Systems

39 ANS:



PTS: 4

REF: 080939ia

STA: A.S.5

TOP: Box-and-Whisker Plots



## 0110ia

## Answer Section

- 1 ANS: 1                      PTS: 2                      REF: 011001ia                      STA: A.S.6  
TOP: Box-and-Whisker Plots
- 2 ANS: 2                      PTS: 2                      REF: 011002ia                      STA: A.S.20  
TOP: Theoretical Probability
- 3 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
- 4 ANS: 1                      PTS: 2                      REF: 011004ia                      STA: A.A.31  
TOP: Set Theory
- 5 ANS: 2                      PTS: 2                      REF: 011005ia                      STA: A.A.5  
TOP: Modeling Inequalities
- 6 ANS: 2  
 $R = 0.5^{d-1}$
- PTS: 2                      REF: 011006ia                      STA: A.A.9                      TOP: Exponential Functions
- 7 ANS: 4  
 $A(-3,4)$  and  $B(5,8)$ .  $m = \frac{4-8}{-3-5} = \frac{-4}{-8} = \frac{1}{2}$
- PTS: 2                      REF: 011007ia                      STA: A.A.33                      TOP: Slope
- 8 ANS: 3  
 $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{15}{17}$
- PTS: 2                      REF: 011008ia                      STA: A.A.42                      TOP: Trigonometric Ratios
- 9 ANS: 2  
Debbie failed to distribute the 3 properly.
- PTS: 2                      REF: 011009ia                      STA: A.A.22                      TOP: Solving Equations
- 10 ANS: 1  
 $-|a-b| = -|7-(-3)| = -|-10| = -10$
- PTS: 2                      REF: 011010ia                      STA: A.N.6                      TOP: Evaluating Expressions
- 11 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

- 12 ANS: 2                   PTS: 2                   REF: 011012ia           STA: A.G.9  
TOP: Quadratic-Linear Systems
- 13 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
- 14 ANS: 3  
Frequency is not a variable.
- PTS: 2                   REF: 011014ia           STA: A.S.2           TOP: Analysis of Data
- 15 ANS: 2                   PTS: 2                   REF: 011015ia           STA: A.G.10  
TOP: Identifying the Vertex of a Quadratic Given Graph
- 16 ANS: 4                   PTS: 2                   REF: 011016ia           STA: A.A.23  
TOP: Transforming Formulas
- 17 ANS: 3                   PTS: 2                   REF: 011017ia           STA: A.G.5  
TOP: Graphing Absolute Value Functions
- 18 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
- 19 ANS: 2                   PTS: 2                   REF: 011019ia           STA: A.S.12  
TOP: Scatter Plots
- 20 ANS: 4                   PTS: 2                   REF: 011020ia           STA: A.A.12  
TOP: Multiplication of Powers
- 21 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
- 22 ANS: 2                   PTS: 2                   REF: 011022ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 23 ANS: 2                   PTS: 2                   REF: 011023ia           STA: A.A.40  
TOP: Systems of Linear Inequalities
- 24 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

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

26 ANS: 1

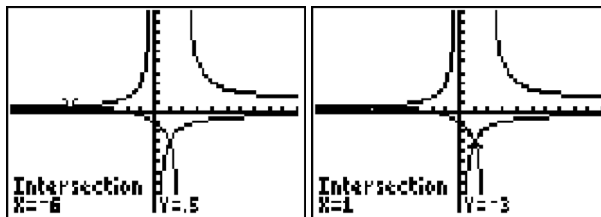
The slope of  $2x - 4y = 16$  is  $\frac{-A}{B} = \frac{-2}{-4} = \frac{1}{2}$

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

27 ANS: 2                      PTS: 2                      REF: 011027ia                      STA: A.A.3

TOP: Expressions

28 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

29 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

30 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

31 ANS:

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

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

32 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

33 ANS:

$$\text{orchestra: } \frac{3}{26} > \frac{4}{36}$$

PTS: 2

REF: 011033ia

STA: A.S.22

TOP: Theoretical Probability

34 ANS:

$$-2, 3. \quad x^2 - x = 6$$

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

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

$$x = 3 \text{ or } -2$$

PTS: 3

REF: 011034ia

STA: A.A.28

TOP: Roots of Quadratics

35 ANS:

81.3, 80, both increase

PTS: 3

REF: 011035ia

STA: A.S.16

TOP: Central Tendency

36 ANS:

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

PTS: 3

REF: 011036ia

STA: A.M.3

TOP: Error

37 ANS:

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

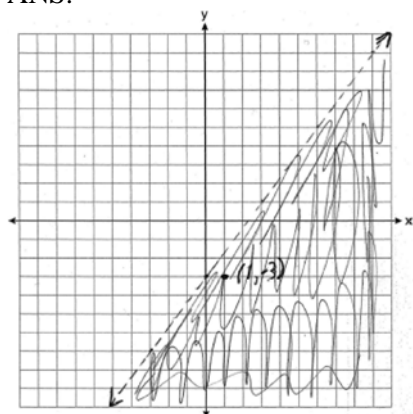
PTS: 4

REF: 011037ia

STA: A.N.8

TOP: Permutations

38 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

39 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

**0610ia**  
**Answer Section**

- 1 ANS: 4                      PTS: 2                      REF: 061001ia                      STA: A.A.30  
TOP: Set Theory
- 2 ANS: 4  
 $5 \times 2 \times 3 = 30$
- PTS: 2                      REF: 061002ia                      STA: A.N.7                      TOP: Multiplication Counting Principle
- 3 ANS: 3                      PTS: 2                      REF: 061003ia                      STA: A.A.13  
TOP: Addition and Subtraction of Polynomials                      KEY: addition
- 4 ANS: 2  
 $m = \frac{5-2}{3-(-2)} = \frac{3}{5}$
- PTS: 2                      REF: 061004ia                      STA: A.A.33                      TOP: Slope
- 5 ANS: 1                      PTS: 2                      REF: 061005ia                      STA: A.G.10  
TOP: Identifying the Vertex of a Quadratic Given Graph
- 6 ANS: 3  
 $\frac{15}{15+13+12} = \frac{15}{40} = \frac{3}{8}$
- PTS: 2                      REF: 061006ia                      STA: A.S.21                      TOP: Experimental Probability
- 7 ANS: 3  
 $2(1)+3=5$
- PTS: 2                      REF: 061007ia                      STA: A.A.39                      TOP: Linear Equations
- 8 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
- 9 ANS: 2  
 $\tan A = \frac{\text{opposite}}{\text{adjacent}} = \frac{14}{48}$
- PTS: 2                      REF: 061009ia                      STA: A.A.42                      TOP: Trigonometric Ratios
- 10 ANS: 1                      PTS: 2                      REF: 061010ia                      STA: A.A.40  
TOP: Systems of Linear Inequalities
- 11 ANS: 3                      PTS: 2                      REF: 061011ia                      STA: A.S.2  
TOP: Analysis of Data

12 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

13 ANS: 4

PTS: 2

REF: 061013ia

STA: A.G.3

TOP: Defining Functions

14 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

15 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

16 ANS: 4

PTS: 2

REF: 061016ia

STA: A.A.2

TOP: Expressions

17 ANS: 3

PTS: 2

REF: 061017ia

STA: A.S.11

TOP: Quartiles and Percentiles

18 ANS: 4

PTS: 2

REF: 061018ia

STA: A.A.12

TOP: Division of Powers

19 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

20 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

- 21 ANS: 1                   PTS: 2                   REF: 061021ia           STA: A.A.29  
TOP: Set Theory
- 22 ANS: 4                   PTS: 2                   REF: 061022ia           STA: A.S.3  
TOP: Analysis of Data
- 23 ANS: 2                   PTS: 2                   REF: 061023ia           STA: A.A.23  
TOP: Transforming Formulas
- 24 ANS: 1                   PTS: 2                   REF: 061024ia           STA: A.A.17  
TOP: Addition and Subtraction of Rationals
- 25 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
- 26 ANS: 4  
 ${}_8P_3 = 336$
- PTS: 2                   REF: 061026ia           STA: A.N.8           TOP: Permutations
- 27 ANS: 2                   PTS: 2                   REF: 061027ia           STA: A.A.20  
TOP: Factoring Polynomials
- 28 ANS: 4                   PTS: 2                   REF: 061028ia           STA: A.G.6  
TOP: Linear Inequalities
- 29 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
- 30 ANS: 1  
$$15000(1.2)^{\frac{6}{3}} = 21,600. \quad 21,600 - 15,000 = 6,600$$
- PTS: 2                   REF: 061030ia           STA: A.A.9           TOP: Exponential Functions
- 31 ANS:  
$$\frac{600 - 592}{592} \approx 0.014$$
- PTS: 2                   REF: 061031ia           STA: A.M.3           TOP: Relative Error
- 32 ANS:  
-6a + 42. distributive
- PTS: 2                   REF: 061032ia           STA: A.N.1           TOP: Properties of Reals



33 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

34 ANS:

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

$$x + 9 < -6x - 21$$

$$7x < -30$$

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

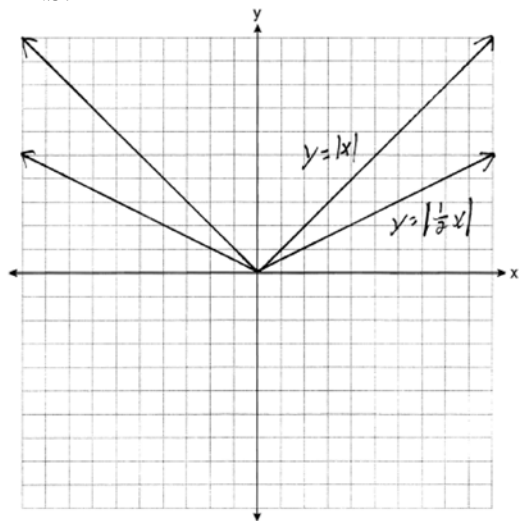
PTS: 3

REF: 061034ia

STA: A.A.21

TOP: Interpreting Solutions

35 ANS:



. Graph becomes wider as the coefficient approaches 0.

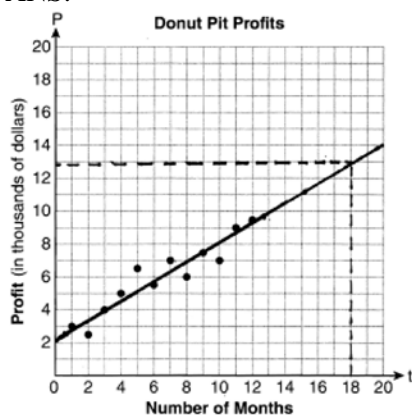
PTS: 3

REF: 061035ia

STA: A.G.5

TOP: Graphing Absolute Value Functions

36 ANS:



They will not reach their goal in 18 months.

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

37 ANS:

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

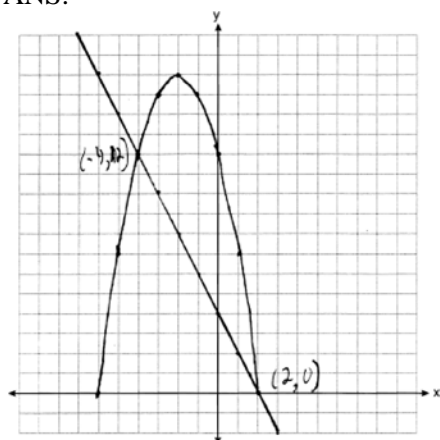
PTS: 4 REF: 061037ia STA: A.A.18 TOP: Multiplication and Division of Rationals

38 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

39 ANS:



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

## 0810ia

## Answer Section

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

2 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

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

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

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

5 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

6 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

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

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

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

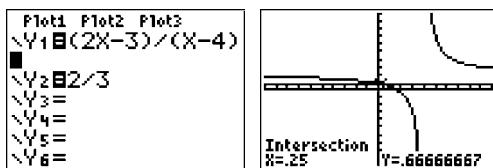
9 ANS: 3                      PTS: 2                      REF: 081009ia                      STA: A.A.30  
TOP: Set Theory

10 ANS: 1  
 $2y - 2x = 10$       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

11 ANS: 4                   PTS: 2                   REF: 081011ia           STA: A.A.5  
TOP: Modeling Equations

12 ANS: 2



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

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

$$6x-9 = 2x-8$$

$$4x = 1$$

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

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

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

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

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

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

16 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

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

18 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

19 ANS: 2

shaded = whole – unshaded

= rectangle-triangle

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

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

$$= 90 - 34.5$$

$$= 55.5$$

PTS: 2

REF: 081019ia

STA: A.G.1

TOP: Compositions of Polygons and Circles

20 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

21 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

22 ANS: 4

PTS: 2

REF: 081022ia

STA: A.A.29

TOP: Set Theory

23 ANS: 2

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

PTS: 2

REF: 081023ia

STA: A.M.3

TOP: Error

24 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

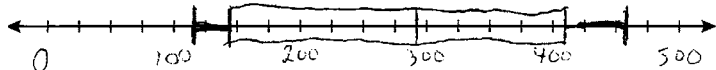
TOP: Theoretical Probability

KEY: independent events

- 25 ANS: 4                      PTS: 2                      REF: 081025ia                      STA: A.G.4  
TOP: Families of Functions
- 26 ANS: 2  
 $\tan B = \frac{\text{opposite}}{\text{adjacent}} = \frac{8}{15} = 0.5\bar{3}$
- PTS: 2                      REF: 081026ia                      STA: A.A.42                      TOP: Trigonometric Ratios
- 27 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
- 28 ANS: 3  
 ${}_6P_4 = 360$
- PTS: 2                      REF: 081028ia                      STA: A.N.8                      TOP: Permutations
- 29 ANS: 2  
 $m = \frac{5-3}{8-1} = \frac{2}{7}$   $y - y_1 = m(x - x_1)$   
 $y - 5 = \frac{2}{7}(x - 8)$
- PTS: 2                      REF: 081029ia                      STA: A.A.35                      TOP: Writing Linear Equations
- 30 ANS: 1                      PTS: 2                      REF: 081030ia                      STA: A.A.3  
TOP: Expressions
- 31 ANS:  
 $3a^2b^2 - 6a \frac{45a^4b^3 - 90a^3b}{15a^2b} = \frac{45a^4b^3}{15a^2b} - \frac{90a^3b}{15a^2b} = 3a^2b^2 - 6a$
- PTS: 2                      REF: 081031ia                      STA: A.A.14                      TOP: Rational Expressions
- 32 ANS:  
 $2,160 \frac{1,200}{25} = \frac{x}{45}$   
 $25x = 54,000$   
 $x = 2,160$
- PTS: 2                      REF: 081032ia                      STA: A.M.1                      TOP: Using Rate
- 33 ANS:  
 $-3\sqrt{48} = -3\sqrt{16}\sqrt{3} = -12\sqrt{3}$
- PTS: 2                      REF: 081033ia                      STA: A.N.2                      TOP: Simplifying Radicals

34 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

35 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

36 ANS:

$$-15,2 \quad x^2 + 13x - 30 = 0$$

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

$$x = -15,2$$

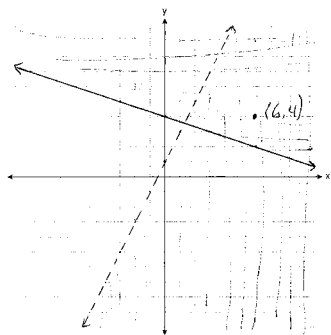
PTS: 3

REF: 081036ia

STA: A.A.28

TOP: Roots of Quadratics

37 ANS:



PTS: 4

REF: 081037ia

STA: A.G.7

TOP: Systems of Linear Inequalities

38 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

39 ANS:

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

$$x \approx 84 \quad y \approx 71$$

PTS: 4

REF: 081039ia

STA: A.A.44

TOP: Using Trigonometry to Find a Side

**0111ia**  
**Answer Section**

- |   |        |               |             |                               |
|---|--------|---------------|-------------|-------------------------------|
| 1 | ANS: 1 | REF: 011101ia | STA: A.A.31 | TOP: Set Theory               |
| 2 | ANS: 4 | REF: 011102ia | STA: A.G.9  | TOP: Quadratic-Linear Systems |
| 3 | ANS: 3 | REF: 011103ia | STA: A.S.12 | TOP: Scatter Plots            |
| 4 | ANS: 3 | REF: 011104ia | STA: A.A.1  | TOP: Expressions              |

5 ANS: 4

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

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

6 ANS: 1

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

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

$$-12 = 6x$$

$$-2 = x$$

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

7 ANS: 2

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

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

8 ANS: 2

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

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

9 ANS: 1

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

REF: 011109ia      STA: A.A.42      TOP: Trigonometric Ratios

10 ANS: 2

REF: 011110ia

STA: A.N.6

TOP: Evaluating Expressions

11 ANS: 4

REF: 011111ia

STA: A.G.8

TOP: Solving Quadratics by Graphing

12 ANS: 1

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

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

$$6x = 3$$

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

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



13 ANS: 3  
 $75 - 15 = 60$

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

14 ANS: 4 REF: 011114ia STA: A.N.1 TOP: Properties of Reals

15 ANS: 2  
 $J - M = 3$

$$8J + 8M = 120$$

$$8J - 8M = 24$$

$$16J = 144$$

$$J = 9$$

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

16 ANS: 4 REF: 011116ia STA: A.S.1 TOP: Analysis of Data

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

18 ANS: 1  
 mean =  $81\frac{7}{11}$ , median = 81 and mode = 76

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

19 ANS: 2 REF: 011119ia STA: A.A.29 TOP: Set Theory

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

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

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

REF: 011121ia STA: A.N.3 TOP: Operations with Radicals

KEY: addition

22 ANS: 2  
 $m = \frac{-A}{B} = \frac{-3}{-7} = \frac{3}{7}$

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

23 ANS: 2  
 $A = lw + lw + \frac{\pi r^2}{4} = 5 \cdot 3 + 5 \cdot 3 + \frac{\pi \cdot 3^2}{4} \approx 37$

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

KEY: area

24 ANS: 3

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

REF: 011124ia STA: A.A.12 TOP: Powers of Powers

25 ANS: 4

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

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

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

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

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

27 ANS: 1

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

REF: 011127ia STA: A.A.41 TOP: Identifying the Vertex of a Quadratic Given Equation

28 ANS: 2

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

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

$$x = 5 \quad x = -3$$

REF: 011128ia STA: A.A.28 TOP: Roots of Quadratics

29 ANS: 3

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

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

30 ANS: 1

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

REF: 011130ia STA: A.A.16 TOP: Rational Expressions

KEY:  $a > 0$ 

31 ANS:

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

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

32 ANS:

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

REF: 011132ia STA: A.S.20 TOP: Theoretical Probability

33 ANS:

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

$$x \approx 2.1$$

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

34 ANS:

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

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

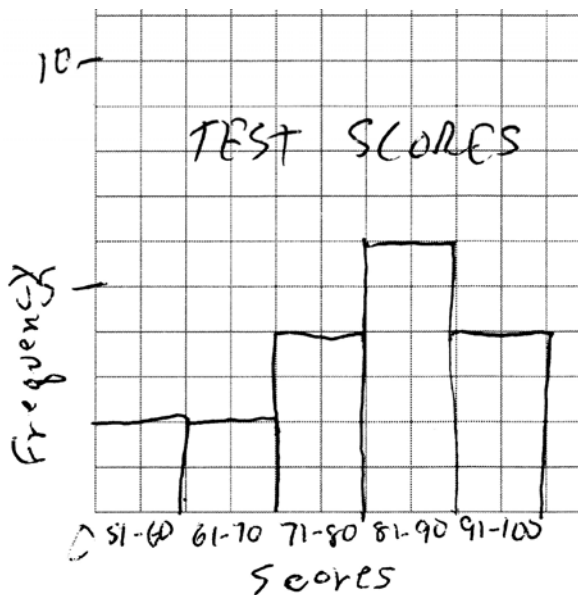
$$4 = -6 + b$$

$$10 = b$$

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

35 ANS:

Interval	Tally	Frequency
51-60		2
61-70		2
71-80		4
81-90		6
91-100		4



REF: 011135ia STA: A.S.5 TOP: Frequency Histograms, Bar Graphs and Tables

36 ANS:

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

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

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

$$x^2 + x - 20 = 0$$

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

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

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

37 ANS:

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

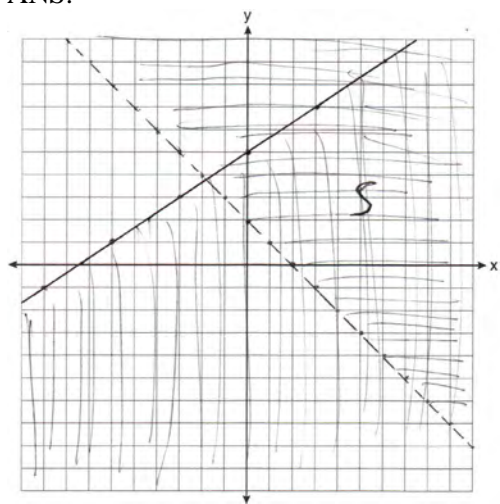
REF: 011137ia STA: A.M.3 TOP: Error KEY: volume and surface area

38 ANS:

$$24,435.19. \quad 30000(.95)^4 \approx 24435.19$$

REF: 011138ia STA: A.A.9 TOP: Exponential Functions

39 ANS:



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

**0611ia**  
**Answer Section**

- 1 ANS: 3                      PTS: 2                      REF: 061101ia                      STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 2 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
- 3 ANS: 1                      PTS: 2                      REF: 061103ia                      STA: A.A.12  
TOP: Division of Powers
- 4 ANS: 3  
 $P(\text{odd}) = \frac{3}{6}, P(\text{prime}) = \frac{3}{6}, P(\text{perfect square}) = \frac{2}{6}, P(\text{even}) = \frac{3}{6}$
- PTS: 2                      REF: 061104ia                      STA: A.S.22                      TOP: Geometric Probability
- 5 ANS: 2                      PTS: 2                      REF: 061105ia                      STA: A.A.20  
TOP: Factoring Polynomials
- 6 ANS: 3  
 $3\sqrt{250} = 3\sqrt{25}\sqrt{10} = 15\sqrt{10}$
- PTS: 2                      REF: 061106ia                      STA: A.N.2                      TOP: Simplifying Radicals
- 7 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
- 8 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
- 9 ANS: 4  
 ${}_5P_5 = 5 \times 4 \times 3 \times 2 \times 1 = 120$
- PTS: 2                      REF: 061109ia                      STA: A.N.8                      TOP: Permutations
- 10 ANS: 3  
 $m = \frac{6-4}{3-(-2)} = \frac{2}{5}$
- PTS: 2                      REF: 061110ia                      STA: A.A.33                      TOP: Slope
- 11 ANS: 4                      PTS: 2                      REF: 061111ia                      STA: A.G.4  
TOP: Families of Functions

- 12 ANS: 4                   PTS: 2                   REF: 061112ia           STA: A.A.36  
TOP: Parallel and Perpendicular Lines
- 13 ANS: 2                   PTS: 2                   REF: 061113ia           STA: A.G.5  
TOP: Graphing Quadratic Functions
- 14 ANS: 1                   PTS: 2                   REF: 061114ia           STA: A.A.43  
TOP: Using Trigonometry to Find an Angle
- 15 ANS: 2                   PTS: 2                   REF: 061115ia           STA: A.S.7  
TOP: Scatter Plots

16 ANS: 2

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

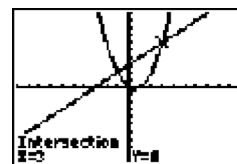
PTS: 2                   REF: 061116ia           STA: A.G.3           TOP: Defining Functions

17 ANS: 1

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

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

18 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

19 ANS: 3                   PTS: 2                   REF: 061119ia           STA: A.A.2

TOP: Expressions

20 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

21 ANS: 2                   PTS: 2                   REF: 061121ia           STA: A.A.3

TOP: Expressions

22 ANS: 2                   PTS: 2                   REF: 061122ia           STA: A.S.14

TOP: Analysis of Data

23 ANS: 4                   PTS: 2                   REF: 061123ia           STA: A.A.31

TOP: Set Theory

24 ANS: 2

$$20000(.88)^3 = 13629.44$$

PTS: 2                   REF: 061124ia           STA: A.A.9           TOP: Exponential Functions

25 ANS: 4

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

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

$$x = 6 \quad x = -2$$

PTS: 2

REF: 061125ia

STA: A.A.15

TOP: Undefined Rationals

26 ANS: 1

$$f + m = 53$$

$$f - m = 25$$

$$2m = 28$$

$$m = 14$$

PTS: 2

REF: 061126ia

STA: A.A.7

TOP: Writing Linear Systems

27 ANS: 2

PTS: 2

REF: 061127ia

STA: A.N.4

TOP: Operations with Scientific Notation

28 ANS: 2

PTS: 2

REF: 061128ia

STA: A.A.29

TOP: Set Theory

29 ANS: 4

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

PTS: 2

REF: 061129ia

STA: A.A.17

TOP: Addition and Subtraction of Rationals

30 ANS: 4

PTS: 2

REF: 061130ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

31 ANS:

$$\frac{x^2 - 5x - 24}{x - 8} = \frac{(x - 8)(x + 3)}{x - 8} = x + 3$$

PTS: 2

REF: 061131ia

STA: A.A.14

TOP: Division of Polynomials

32 ANS:

(1) Distributive; (2) Commutative

PTS: 2

REF: 061132ia

STA: A.N.1

TOP: Identifying Properties

33 ANS:

$$x = 1; (1, -5)$$

PTS: 2

REF: 061133ia

STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

34 ANS:

12, 7. Both the median and the mode will increase.

PTS: 3

REF: 061134ia

STA: A.S.16

TOP: Central Tendency

35 ANS:

$$0.65x + 35 \leq 45$$

$$0.65x \leq 10$$

$$x \leq 15$$

PTS: 3

REF: 061135ia

STA: A.A.6

TOP: Modeling Inequalities

36 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

37 ANS:

$$-\frac{9}{4}; \quad \frac{3}{4} = \frac{-(x+11)}{4x} + \frac{1}{2x}$$

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

$$\frac{3}{4} = \frac{-x-9}{4x}$$

$$12x = -4x - 36$$

$$16x = -36$$

$$x = -\frac{9}{4}$$

PTS: 4

REF: 061137ia

STA: A.A.26

TOP: Solving Rationals

38 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

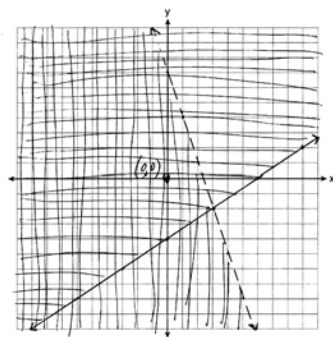
REF: 061138ia

STA: A.S.19

TOP: Sample Space



39 ANS:



PTS: 4

REF: 061139ia

STA: A.G.7

TOP: Systems of Linear Inequalities

## 0811ia

## Answer Section

1 ANS: 4

$$\frac{150}{20} = \frac{x}{30}$$

$$20x = 4500$$

$$x = 225$$

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

2 ANS: 1 PTS: 2 REF: 081102ia STA: A.S.12

TOP: Scatter Plots

3 ANS: 3 PTS: 2 REF: 081103ia STA: A.A.30

TOP: Set Theory

4 ANS: 2 PTS: 2 REF: 081104ia STA: A.S.14

TOP: Analysis of Data

5 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

6 ANS: 2 PTS: 2 REF: 081106ia STA: A.S.6

TOP: Box-and-Whisker Plots

7 ANS: 4 PTS: 2 REF: 081107ia STA: A.A.5

TOP: Modeling Inequalities

8 ANS: 1

$$y = mx + b$$

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

$$b = 7$$

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

9 ANS: 3

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

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

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

$$y = -1$$

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

10 ANS: 1 PTS: 2 REF: 081110ia STA: A.A.1

TOP: Expressions

11 ANS: 2 PTS: 2 REF: 081111ia STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

12 ANS: 2

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

PTS: 2

REF: 081112ia

STA: A.A.42

TOP: Trigonometric Ratios

13 ANS: 1

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

PTS: 2

REF: 081113ia

STA: A.N.6

TOP: Evaluating Expressions

14 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

15 ANS: 1

PTS: 2

REF: 081115ia

STA: A.A.32

TOP: Slope

16 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

17 ANS: 3

PTS: 2

REF: 081117ia

STA: A.A.29

TOP: Set Theory

18 ANS: 3

PTS: 2

REF: 081118ia

STA: A.G.4

TOP: Families of Functions

19 ANS: 1

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

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

$$b = 31 - j \quad j = 9$$

PTS: 2

REF: 081119ia

STA: A.A.7

TOP: Writing Linear Systems

20 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

- 21 ANS: 4  
 $-6x - 17 \geq 8x + 25$   
 $-42 \geq 14x$   
 $-3 \geq x$
- PTS: 2 REF: 081121ia STA: A.A.24 TOP: Solving Inequalities
- 22 ANS: 4  
 The other situations are quantitative.
- PTS: 2 REF: 081122ia STA: A.S.1 TOP: Analysis of Data
- 23 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
- 24 ANS: 2  
 $2000(1 + 0.04)^3 \approx 2249$
- PTS: 2 REF: 081124ia STA: A.A.9 TOP: Exponential Functions
- 25 ANS: 3  
 $P(O) = \frac{5}{10}, P(P) = \frac{4}{10}, P(\leq 5) = \frac{6}{10}, P(3) = \frac{4}{10}$
- PTS: 2 REF: 081125ia STA: A.S.22 TOP: Theoretical Probability
- 26 ANS: 2  
 $\cos 38 = \frac{10}{x}$   
 $x = \frac{10}{\cos 38} \approx 12.69$
- PTS: 2 REF: 081126ia STA: A.A.44 TOP: Using Trigonometry to Find a Side
- 27 ANS: 2 PTS: 2 REF: 081127ia STA: A.A.40  
 TOP: Systems of Linear Inequalities
- 28 ANS: 1  
 $7 + 8 + 7 + \frac{12\pi}{2} = 22 + 6\pi$
- PTS: 2 REF: 081128ia STA: A.G.1 TOP: Compositions of Polygons and Circles  
 KEY: perimeter
- 29 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

30 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

31 ANS:

$$bc + ac = ab$$

$$c(b+a) = ab$$

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

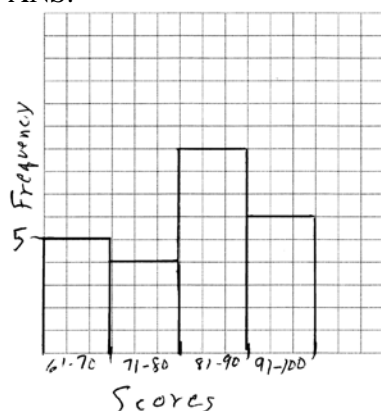
PTS: 2

REF: 081131ia

STA: A.A.23

TOP: Transforming Formulas

32 ANS:



PTS: 2

REF: 081132ia

STA: A.S.5

TOP: Frequency Histograms, Bar Graphs and Tables

KEY: frequency histograms

33 ANS:

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

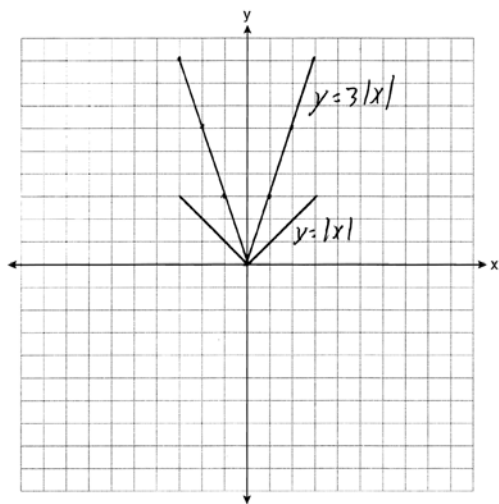
PTS: 2

REF: 081133ia

STA: A.M.2

TOP: Conversions

34 ANS:



The graph becomes steeper.

PTS: 3

REF: 081134ia

STA: A.G.5

TOP: Graphing Absolute Value Functions

35 ANS:

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

$$A \approx 41.8$$

PTS: 3

REF: 081135ia

STA: A.A.43

TOP: Using Trigonometry to Find an Angle

36 ANS:

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

PTS: 3

REF: 081136ia

STA: A.N.3

TOP: Operations with Radicals

37 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

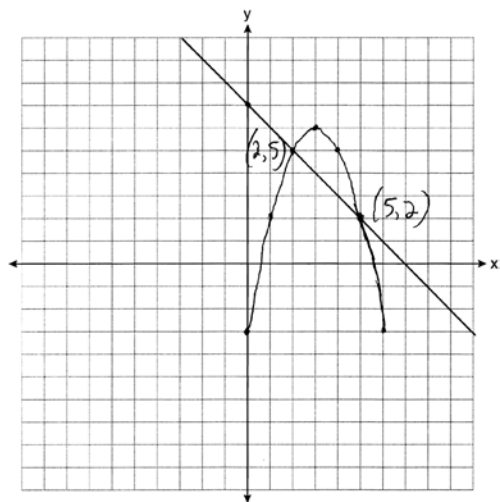
REF: 081137ia

STA: A.S.23

TOP: Theoretical Probability

KEY: dependent events

38 ANS:



PTS: 4

REF: 081138ia

STA: A.G.9

TOP: Quadratic-Linear Systems

39 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