JMAP
REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Integrated Algebra Regents Exam Questions
from Fall 2007 to January 2014 Sorted by PI: Topic

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Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

NUMBERS, OPERATIONS AND PROPERTIES

A.N.6: EVALUATING EXPRESSIONS

1 What is the value of the expression $|-5x + 12|$ when $x = 5$?
 1 -37
 2 -13
 3 13
 4 37

2 The value of the expression $-|a - b|$ when $a = 7$ and $b = -3$ is
 1 -10
 2 10
 3 -4
 4 4

3 What is the value of the expression $(a^3 + b^0)^2$ when $a = -2$ and $b = 4$?
 1 64
 2 49
 3 -49
 4 -64

4 What is the value of the expression $-3x^2y + 4x$ when $x = -4$ and $y = 2$?
 1 -112
 2 -80
 3 80
 4 272

5 What is the value of $\left| \dfrac{4(-6) + 18}{4!} \right|$?

 1 $\dfrac{1}{4}$

 2 $-\dfrac{1}{4}$

 3 12
 4 -12

6 If $x = -3$, what is the value of $|x - 4| - x^2$?
 1 -8
 2 -2
 3 7
 4 16

7 The value of the expression $6! + \dfrac{5!(3!)}{4!} - 10$ is
 1 50
 2 102
 3 740
 4 750

8 When $x = 4$, the value of $2x^0 + x!$ is
 1 24
 2 25
 3 26
 4 28

A.N.1: IDENTIFYING PROPERTIES

9 Which property is illustrated by the equation $ax + ay = a(x + y)$?
 1 associative
 2 commutative
 3 distributive
 4 identity

10 The statement $2 + 0 = 2$ is an example of the use of which property of real numbers?
 1 associative
 2 additive identity
 3 additive inverse
 4 distributive

11 A method for solving $5(x-2) - 2(x-5) = 9$ is shown below. Identify the property used to obtain each of the two indicated steps.

$$5(x-2) - 2(x-5) = 9$$

(1) $5x - 10 - 2x + 10 = 9$ (1) _____

(2) $5x - 2x - 10 + 10 = 9$ (2) _____

$$3x + 0 = 9$$

$$3x = 9$$

$$x = 3$$

12 The equation $3(4x) = (4x)3$ illustrates which property?
1 commutative
2 associative
3 distributive
4 multiplicative inverse

A.N.1: PROPERTIES OF REALS

13 What is the additive inverse of the expression $a - b$?
1 $a + b$
2 $a - b$
3 $-a + b$
4 $-a - b$

14 Perform the indicated operation: $-6(a - 7)$
State the name of the property used.

15 Which equation illustrates the associative property?
1 $x + y + z = x + y + z$
2 $x(y + z) = xy + xz$
3 $x + y + z = z + y + x$
4 $(x + y) + z = x + (y + z)$

16 Which equation is an example of the use of the associative property of addition?
1 $x + 7 = 7 + x$
2 $3(x + y) = 3x + 3y$
3 $(x + y) + 3 = x + (y + 3)$
4 $3 + (x + y) = (x + y) + 3$

17 Which statement illustrates the additive identity property?
1 $6 + 0 = 6$
2 $-6 + 6 = 0$
3 $4(6 + 3) = 4(6) + 4(3)$
4 $(4 + 6) + 3 = 4 + (6 + 3)$

18 Which equation illustrates the multiplicative inverse property?
1 $a \cdot 1 = a$
2 $a \cdot 0 = 0$
3 $a\left(\dfrac{1}{a}\right) = 1$
4 $(-a)(-a) = a^2$

A.A.29: SET THEORY

19 Which interval notation represents the set of all numbers from 2 through 7, inclusive?
1 $(2, 7]$
2 $(2, 7)$
3 $[2, 7)$
4 $[2, 7]$

20 The set $\{1, 2, 3, 4\}$ is equivalent to
1 $\{x | 1 < x < 4,$ where x is a whole number$\}$
2 $\{x | 0 < x < 4,$ where x is a whole number$\}$
3 $\{x | 0 < x \le 4,$ where x is a whole number$\}$
4 $\{x | 1 < x \le 4,$ where x is a whole number$\}$

21 The set $\{11, 12\}$ is equivalent to
1 $\{x | 11 < x < 12,$ where x is an integer$\}$
2 $\{x | 11 < x \le 12,$ where x is an integer$\}$
3 $\{x | 10 \le x < 12,$ where x is an integer$\}$
4 $\{x | 10 < x \le 12,$ where x is an integer$\}$

22 Which interval notation represents the set of all numbers greater than or equal to 5 and less than 12?
1 $[5, 12)$
2 $(5, 12]$
3 $(5, 12)$
4 $[5, 12]$

23 Which set-builder notation describes
$\{-3, -2, -1, 0, 1, 2\}$?
1   $\{x | -3 \le x < 2, \text{ where } x \text{ is an integer}\}$
2   $\{x | -3 < x \le 2, \text{ where } x \text{ is an integer}\}$
3   $\{x | -3 < x < 2, \text{ where } x \text{ is an integer}\}$
4   $\{x | -3 \le x \le 2, \text{ where } x \text{ is an integer}\}$

24 Which interval notation represents the set of all
real numbers greater than 2 and less than or equal
to 20?
1   $(2, 20)$
2   $(2, 20]$
3   $[2, 20)$
4   $[2, 20]$

25 Which notation describes $\{1, 2, 3\}$?
1   $\{x | 1 \le x < 3, \text{ where } x \text{ is an integer}\}$
2   $\{x | 0 < x \le 3, \text{ where } x \text{ is an integer}\}$
3   $\{x | 1 < x < 3, \text{ where } x \text{ is an integer}\}$
4   $\{x | 0 \le x \le 3, \text{ where } x \text{ is an integer}\}$

26 In interval notation, the set of all real numbers
greater than -6 and less than or equal to 14 is
represented by
1   $(-6, 14)$
2   $[-6, 14)$
3   $(-6, 14]$
4   $[-6, 14]$

27 Which set builder notation describes
$\{-2, -1, 0, 1, 2, 3\}$?
1   $\{x | -3 \le x \le 3, \text{ where } x \text{ is an integer}\}$
2   $\{x | -3 < x \le 4, \text{ where } x \text{ is an integer}\}$
3   $\{x | -2 < x < 3, \text{ where } x \text{ is an integer}\}$
4   $\{x | -2 \le x < 4, \text{ where } x \text{ is an integer}\}$

28 Which interval notation describes the set
$S = \{x | 1 \le x < 10\}$?
1   $[1, 10]$
2   $(1, 10]$
3   $[1, 10)$
4   $(1, 10)$

29 The inequality $-2 \le x \le 3$ can be written as
1   $(-2, 3)$
2   $[-2, 3)$
3   $(-2, 3]$
4   $[-2, 3]$

30 Which interval notation represents $-3 \le x \le 3$?
1   $[-3, 3]$
2   $(-3, 3]$
3   $[-3, 3)$
4   $(-3, 3)$

31 Written in set-builder notation, $S = \{1, 3, 5, 7, 9\}$ is
1   $\{x | 1 < x < 9, \text{ where } x \text{ is a prime number}\}$
2   $\{x | 1 \le x \le 9, \text{ where } x \text{ is a prime number}\}$
3   $\{x | 1 < x < 9, \text{ where } x \text{ is an odd integer}\}$
4   $\{x | 1 \le x \le 9, \text{ where } x \text{ is an odd integer}\}$

A.A.30: SET THEORY

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

33 Twelve players make up a high school basketball
team. The team jerseys are numbered 1 through
12. The players wearing the jerseys numbered 3, 6,
7, 8, and 11 are the only players who start a game.
Using set notation, list the complement of this
subset.

34 Given:
   $A = \{$All even integers from 2 to 20, inclusive$\}$

   $B = \{10, 12, 14, 16, 18\}$
   What is the complement of set B within the universe of set A?
   1 $\{4, 6, 8\}$
   2 $\{2, 4, 6, 8\}$
   3 $\{4, 6, 8, 20\}$
   4 $\{2, 4, 6, 8, 20\}$

35 Given: Set $U = \{S, O, P, H, I, A\}$

   Set $B = \{A, I, O\}$
   If set B is a subset of set U, what is the complement of set B?
   1 $\{O, P, S\}$
   2 $\{I, P, S\}$
   3 $\{A, H, P\}$
   4 $\{H, P, S\}$

36 Given: $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$

   $B = \{2, 3, 5, 6\}$
   Set B is a subset of set U. What is the complement of set B?
   1 $\{\ \}$
   2 $\{2, 3, 5, 6\}$
   3 $\{1, 4, 7, 8\}$
   4 $\{1, 2, 3, 4, 5, 6, 7, 8\}$

37 If the universal set is {pennies, nickels, dimes, quarters}, what is the complement of the set {nickels}?
   1 $\{\ \}$
   2 {pennies, quarters}
   3 {pennies, dimes, quarters}
   4 {pennies, nickels, dimes, quarters}

38 Given:
   $A = \{$perfect square integers from 4-100, inclusive$\}$

   $B = \{16, 36, 49, 64\}$
   The complement of set B in the universal set A is
   1 $\{9, 25, 81\}$
   2 $\{4, 9, 25, 81, 100\}$
   3 $\{1, 4, 9, 25, 81, 100\}$
   4 $\{4, 16, 36, 49, 64, 100\}$

39 Given:
   $A = \{$all odd integers from 1 through 19, inclusive$\}$

   $B = \{9, 11, 13, 15, 17\}$
   What is the complement of set B within set A?
   1 $\{3, 5, 7\}$
   2 $\{3, 5, 7, 19\}$
   3 $\{1, 3, 5, 7\}$
   4 $\{1, 3, 5, 7, 19\}$

40 Given: $U = \{x | 0 < x < 10 \text{ and } x \text{ is an integer}\}$

   $S = \{x | 0 < x < 10 \text{ and } x \text{ is an odd integer}\}$
   The complement of set S within the universal set U is
   1 $\{0, 2, 4, 6, 8, 10\}$
   2 $\{2, 4, 6, 8, 10\}$
   3 $\{0, 2, 4, 6, 8\}$
   4 $\{2, 4, 6, 8\}$

A.A.31: SET THEORY

41 Given:
   Set $A = \{(-2, -1), (-1, 0), (1, 8)\}$

   Set $B = \{(-3, -4), (-2, -1), (-1, 2), (1, 8)\}$.
   What is the intersection of sets A and B?
   1 $\{(1, 8)\}$
   2 $\{(-2, -1)\}$
   3 $\{(-2, -1), (1, 8)\}$
   4 $\{(-3, -4), (-2, -1), (-1, 2), (-1, 0), (1, 8)\}$

42 Maureen tracks the range of outdoor temperatures over three days. She records the following information.
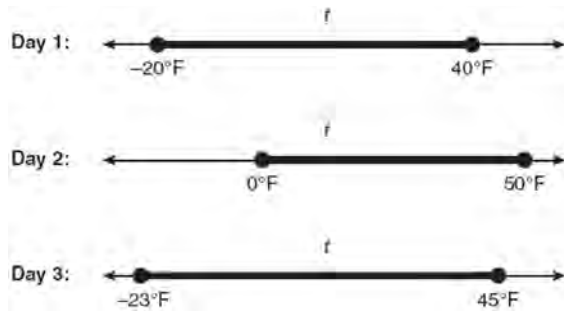
Express the intersection of the three sets as an inequality in terms of temperature, t.

43 Given: $Q = \{0, 2, 4, 6\}$

$W = \{0, 1, 2, 3\}$

$Z = \{1, 2, 3, 4\}$

What is the intersection of sets Q, W, and Z?
1    $\{2\}$
2    $\{0, 2\}$
3    $\{1, 2, 3\}$
4    $\{0, 1, 2, 3, 4, 6\}$

44 Which set represents the intersection of sets A, B, and C shown in the diagram below?
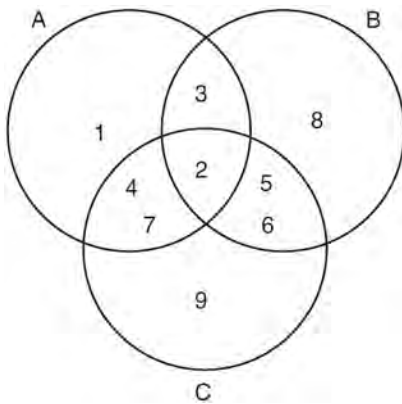
1    $\{3, 4, 5, 6, 7\}$
2    $\{2\}$
3    $\{2, 3, 4, 5, 6, 7\}$
4    $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

45 Given: $X = \{1, 2, 3, 4\}$

$Y = \{2, 3, 4, 5\}$

$Z = \{3, 4, 5, 6\}$

What is the intersection of sets X, Y, and Z?
1    $\{3, 4\}$
2    $\{2, 3, 4\}$
3    $\{3, 4, 5\}$
4    $\{1, 2, 3, 4, 5, 6\}$

46 Given: $A = \{3, 6, 9, 12, 15\}$

$B = \{2, 4, 6, 8, 10, 12\}$

What is the union of sets A and B?
1    $\{6\}$
2    $\{6, 12\}$
3    $\{2, 3, 4, 8, 9, 10, 15\}$
4    $\{2, 3, 4, 6, 8, 9, 10, 12, 15\}$

47 Given: $A = \{2, 4, 5, 7, 8\}$

$B = \{3, 5, 8, 9\}$

What is $A \cup B$?
1    $\{5\}$
2    $\{5, 8\}$
3    $\{2, 3, 4, 7, 9\}$
4    $\{2, 3, 4, 5, 7, 8, 9\}$

48 If $A = \{0, 1, 3, 4, 6, 7\}$, $B = \{0, 2, 3, 5, 6\}$, and $C = \{0, 1, 4, 6, 7\}$, then $A \cap B \cap C$ is
1    $\{0, 1, 2, 3, 4, 5, 6, 7\}$
2    $\{0, 3, 6\}$
3    $\{0, 6\}$
4    $\{0\}$

49 Given: $A = \{1, 3, 5, 7, 9\}$

$B = \{2, 4, 6, 8, 10\}$

$C = \{2, 3, 5, 7\}$

$D = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

What statement is *false*?

1   $A \cup B \cup C = D$
2   $A \cap B \cap C = \{\}$
3   $A \cup C = \{1, 2, 3, 5, 7\}$
4   $A \cap C = \{3, 5, 7\}$

50 Given: $R = \{1, 2, 3, 4\}$

$A = \{0, 2, 4, 6\}$

$P = \{1, 3, 5, 7\}$

What is $R \cap P$?

1   $\{0, 1, 2, 3, 4, 5, 6, 7\}$
2   $\{1, 2, 3, 4, 5, 7\}$
3   $\{1, 3\}$
4   $\{2, 4\}$

GRAPHS AND STATISTICS
A.S.5: FREQUENCY HISTOGRAMS, BAR GRAPHS AND TABLES

51 Twenty students were surveyed about the number of days they played outside in one week. The results of this survey are shown below.

$\{6, 5, 4, 3, 0, 7, 1, 5, 4, 4, 3, 2, 2, 3, 2, 4, 3, 4, 0, 7\}$

Complete the frequency table below for these data.

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

Complete the cumulative frequency table below using these data.

Number of Days Outside

Interval	Cumulative Frequency
0–1	
0–3	
0–5	
0–7	

On the grid below, create a cumulative frequency histogram based on the table you made.
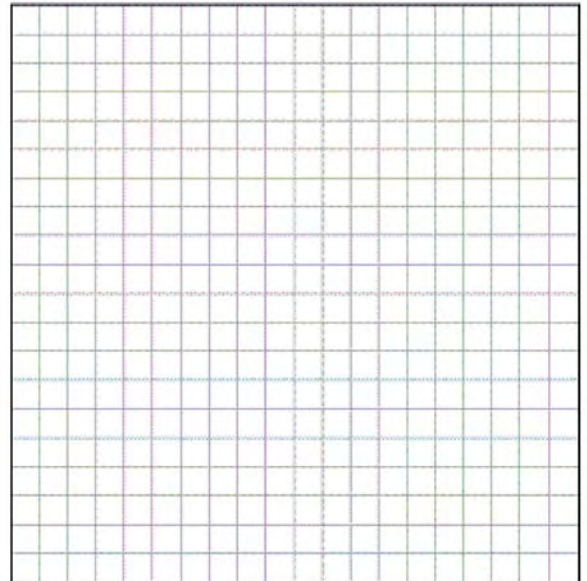
52 The Fahrenheit temperature readings on 30 April mornings in Stormville, New York, are shown below.

41°, 58°, 61°, 54°, 49°, 46°, 52°, 58°, 67°, 43°,
47°, 60°, 52°, 58°, 48°, 44°, 59°, 66°, 62°, 55°,
44°, 49°, 62°, 61°, 59°, 54°, 57°, 58°, 63°, 60°

Using the data, complete the frequency table below.

Interval	Tally	Frequency
40–44		
45–49		
50–54		
55–59		
60–64		
65–69		

On the grid below, construct and label a frequency histogram based on the table.
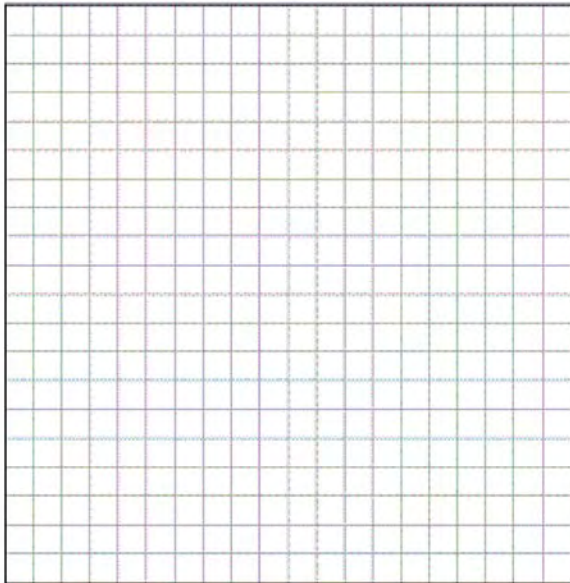
53 The test scores for 18 students in Ms. Mosher's class are listed below:

86, 81, 79, 71, 58, 87, 52, 71, 87,
87, 93, 64, 94, 81, 76, 98, 94, 68

Complete the frequency table below.

Interval	Tally	Frequency
51–60		
61–70		
71–80		
81–90		
91–100		

Draw and label a frequency histogram on the grid below.
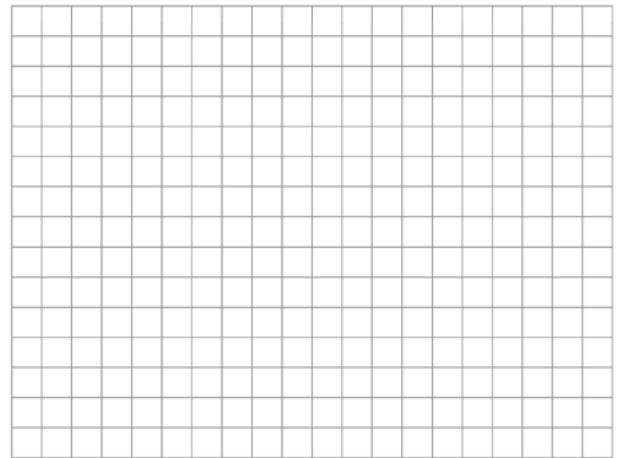
54 Ms. Hopkins recorded her students' final exam scores in the frequency table below.

Interval	Tally	Frequency
61–70	⊞	5
71–80	IIII	4
81–90	⊞ IIII	9
91–100	⊞ I	6

On the grid below, construct a frequency histogram based on the table.
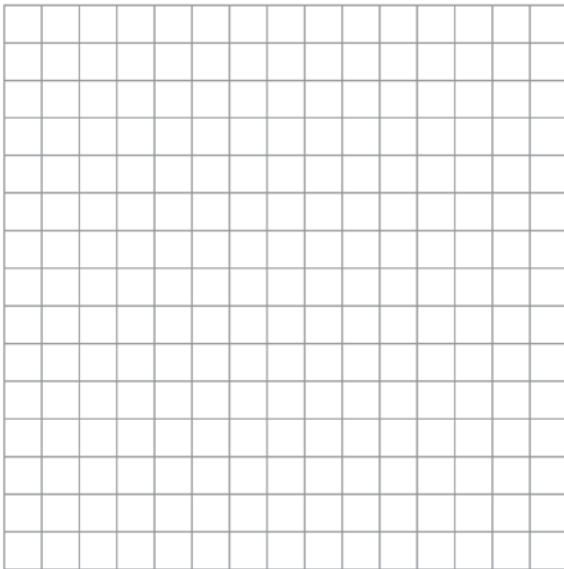
A.S.9: FREQUENCY HISTOGRAMS, BAR GRAPHS AND TABLES

55 The table below shows a cumulative frequency distribution of runners' ages.

Cumulative Frequency Distribution of Runners' Ages

Age Group	Total
20–29	8
20–39	18
20–49	25
20–59	31
20–69	35

According to the table, how many runners are in their forties?
1   25
2   10
3   7
4   6

56 The diagram below shows a cumulative frequency histogram of the students' test scores in Ms. Wedow's algebra class.

Ms. Wedow's Algebra Class Test Scores
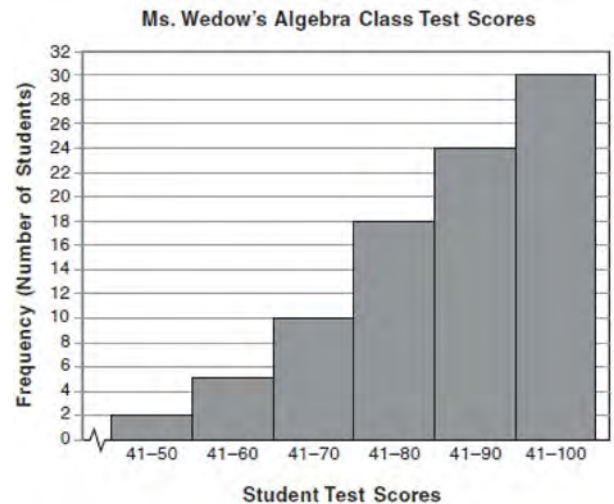
Determine the total number of students in the class. Determine how many students scored higher than 70. State which *ten-point interval* contains the median. State which *two ten-point* intervals contain the same frequency.

57 The cumulative frequency table below shows the length of time that 30 students spent text messaging on a weekend.

Minutes Used	Cumulative Frequency
31–40	2
31–50	5
31–60	10
31–70	19
31–80	30

Which 10-minute interval contains the first quartile?
1   31 – 40
2   41 – 50
3   51 – 60
4   61 – 70

58 The following cumulative frequency histogram shows the distances swimmers completed in a recent swim test.
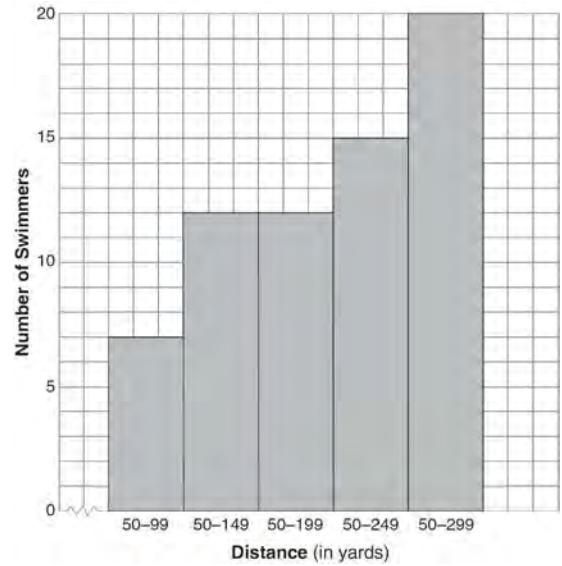
Based on the cumulative frequency histogram, determine the number of swimmers who swam between 200 and 249 yards. Determine the number of swimmers who swam between 150 and 199 yards. Determine the number of swimmers who took the swim test.

59 The cumulative frequency table below shows the number of minutes 31 students spent text messaging on a weekend.

Text-Use Interval (minutes)	Cumulative Frequency
41–50	2
41–60	5
41–70	10
41–80	19
41–90	31

Determine which 10-minute interval contains the median. Justify your choice.

9

A.S.5: BOX-AND-WHISKER PLOTS

60 The data set 5, 6, 7, 8, 9, 9, 9, 10, 12, 14, 17, 17, 18, 19, 19 represents the number of hours spent on the Internet in a week by students in a mathematics class. Which box-and-whisker plot represents the data?
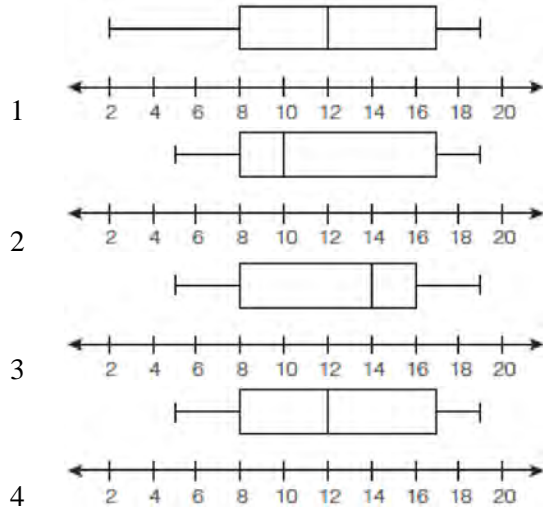
61 The test scores from Mrs. Gray's math class are shown below.
    72, 73, 66, 71, 82, 85, 95, 85, 86, 89, 91, 92
Construct a box-and-whisker plot to display these data.
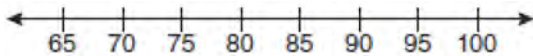
62 The number of songs fifteen students have on their MP3 players is:
    120, 124, 132, 145, 200, 255, 260, 292, 308, 314, 342, 407, 421, 435, 452
State the values of the minimum, 1st quartile, median, 3rd quartile, and maximum. Using these values, construct a box-and-whisker plot using an appropriate scale on the line below.

63 Using the line provided, construct a box-and-whisker plot for the 12 scores below.
    26, 32, 19, 65, 57, 16, 28, 42, 40, 21, 38, 10

Determine the number of scores that lie above the 75th percentile.

A.S.6: BOX-AND-WHISKER PLOTS

64 What is the value of the third quartile shown on the box-and-whisker plot below?
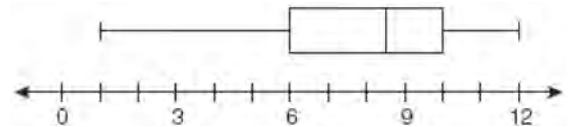
1 6
2 8.5
3 10
4 12

65 A movie theater recorded the number of tickets sold daily for a popular movie during the month of June. The box-and-whisker plot shown below represents the data for the number of tickets sold, in hundreds.
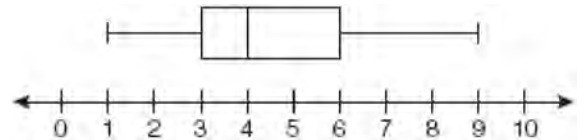
Which conclusion can be made using this plot?
1 The second quartile is 600.
2 The mean of the attendance is 400.
3 The range of the attendance is 300 to 600.
4 Twenty-five percent of the attendance is between 300 and 400.

10

66 The box-and-whisker plot below represents students' scores on a recent English test.
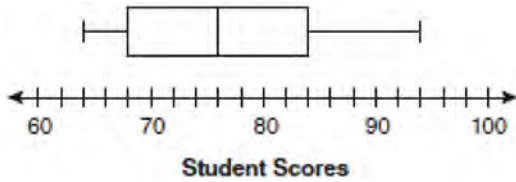
Student Scores

What is the value of the upper quartile?
1   68
2   76
3   84
4   94

67 The box-and-whisker plot below represents the math test scores of 20 students.
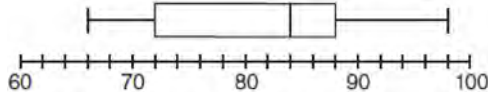
What percentage of the test scores are *less than* 72?
1   25
2   50
3   75
4   100

68 What is the range of the data represented in the box-and-whisker plot shown below?
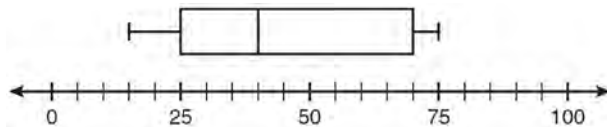
1   40
2   45
3   60
4   100

69 Based on the box-and-whisker plot below, which statement is *false*?
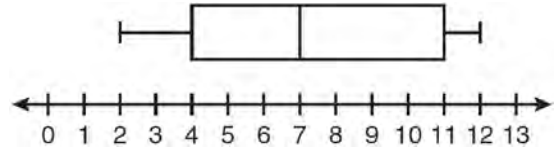
1   The median is 7.
2   The range is 12.
3   The first quartile is 4.
4   The third quartile is 11.

70 The box-and-whisker plot below represents the ages of 12 people.
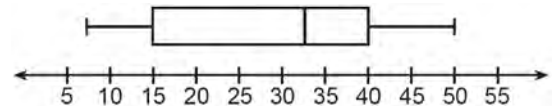
What percentage of these people are age 15 or older?
1   25
2   35
3   75
4   85

71 The box-and-whisker plot below represents the results of tests scores in a math class.
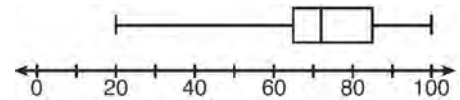
What do the scores 65, 85, and 100 represent?
1   Q_1, median, Q_3
2   Q_1, Q_3, maximum
3   median, Q_1, maximum
4   minimum, median, maximum

72 The box-and-whisker plot below represents a set of grades in a college statistics class.

62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96
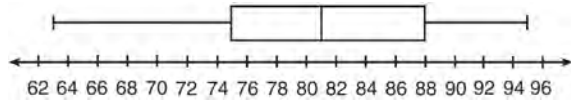
Which interval contains exactly 50% of the grades?
1 63-88
2 63-95
3 75-81
4 75-88

73 The box-and-whisker plot shown below represents the number of magazine subscriptions sold by members of a club.
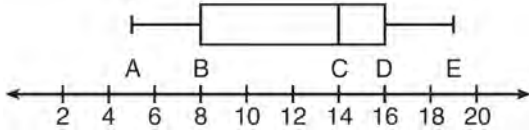
Which statistical measures do points B, D, and E represent, respectively?
1 minimum, median, maximum
2 first quartile, median, third quartile
3 first quartile, third quartile, maximum
4 median, third quartile, maximum

A.S.11: QUARTILES AND PERCENTILES

74 The freshman class held a canned food drive for 12 weeks. The results are summarized in the table below.

Canned Food Drive Results

Week	1	2	3	4	5	6	7	8	9	10	11	12
Number of Cans	20	35	32	45	58	46	28	23	31	79	65	62

Which number represents the second quartile of the number of cans of food collected?
1 29.5
2 30.5
3 40
4 60

75 Brianna's score on a national math assessment exceeded the scores of 95,000 of the 125,000 students who took the assessment. What was her percentile rank?
1 6
2 24
3 31
4 76

A.S.7: SCATTER PLOTS

76 For 10 days, Romero kept a record of the number of hours he spent listening to music. The information is shown in the table below.

Day	1	2	3	4	5	6	7	8	9	10
Hours	9	3	2	6	8	6	10	4	5	2

Which scatter plot shows Romero's data graphically?

1

2

3

4
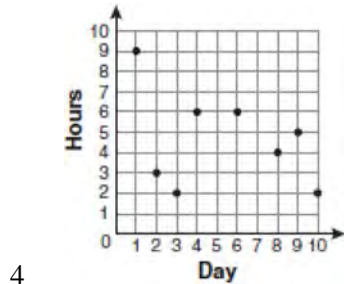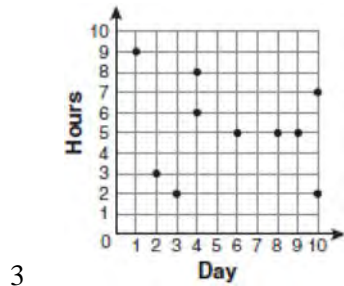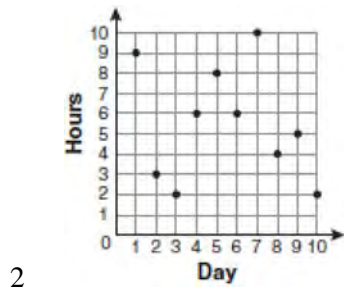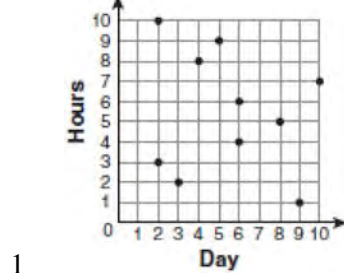
77 The school store did a study comparing the cost of a sweatshirt with the number of sweatshirts sold. The price was changed several times and the numbers of sweatshirts sold were recorded. The data are shown in the table below.

Cost of Sweatshirt	$10	$25	$15	$20	$5
Number Sold	9	6	15	11	14

Which scatter plot represents the data?

1

2

3

4

13
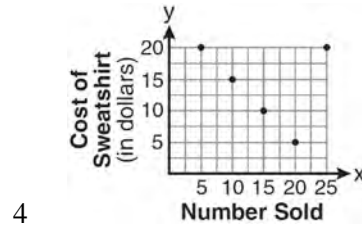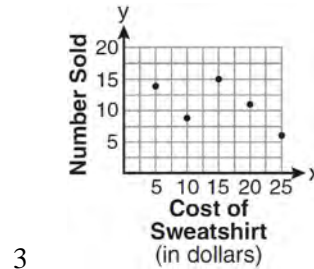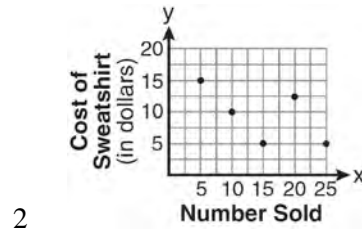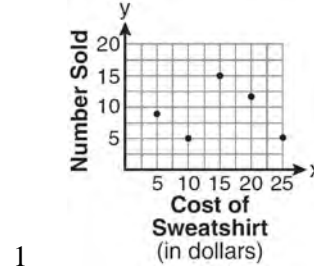
78 The maximum height and speed of various roller
coasters in North America are shown in the table
below.

Maximum Speed, in mph, (x)	45	50	54	60	65	70
Maximum Height, in feet, (y)	63	80	105	118	141	107

Which graph represents a correct scatter plot of the
data?

1

2

3

4
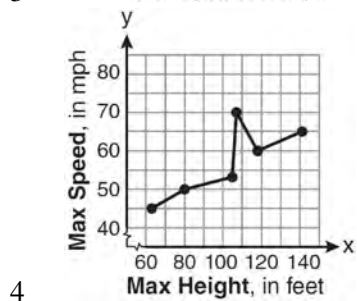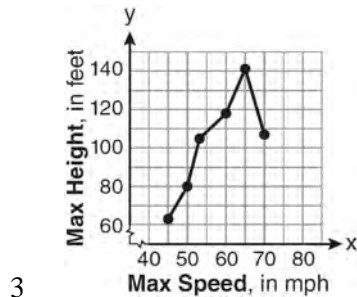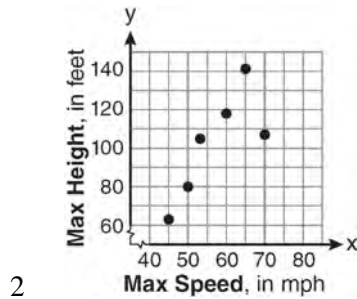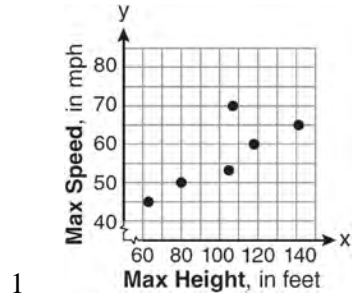
A.S.8: SCATTER PLOTS

79 Which equation most closely represents the line of
best fit for the scatter plot below?

Money Earned from Babysitting

1 $y = x$

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

3 $y = \dfrac{3}{2}x + 4$

4 $y = \dfrac{3}{2}x + 1$

80 The table below shows the number of prom tickets sold over a ten-day period.

Prom Ticket Sales

Day (x)	1	2	5	7	10
Number of Prom Tickets Sold (y)	30	35	55	60	70

Plot these data points on the coordinate grid below. Use a consistent and appropriate scale. Draw a reasonable line of best fit and write its equation.

Prom Ticket Sales
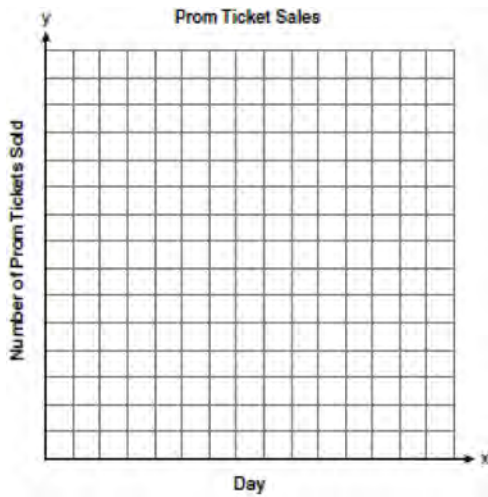
81 A scatter plot was constructed on the graph below and a line of best fit was drawn.
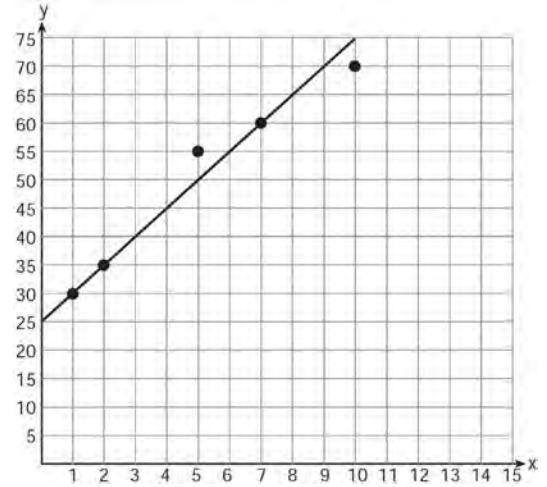
What is the equation of this line of best fit?

1   $y = x + 5$

2   $y = x + 25$

3   $y = 5x + 5$

4   $y = 5x + 25$

A.S.12: SCATTER PLOTS

82 There is a negative correlation between the number of hours a student watches television and his or her social studies test score. Which scatter plot below displays this correlation?

1

2

3

4
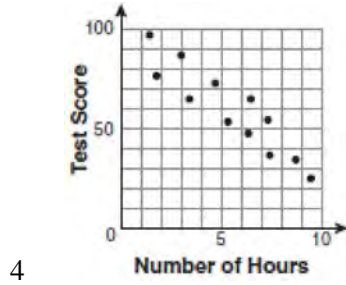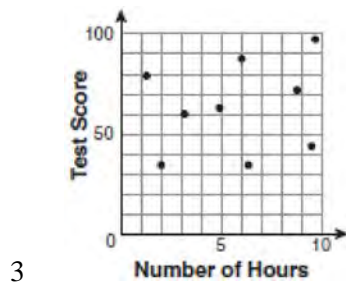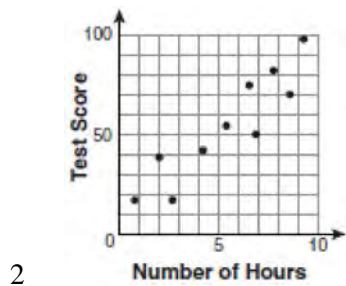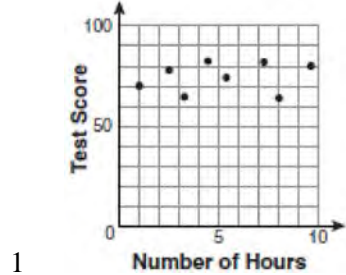
83 Which scatter plot shows the relationship between x and y if x represents a student score on a test and y represents the number of incorrect answers a student received on the same test?

1

2

3

4
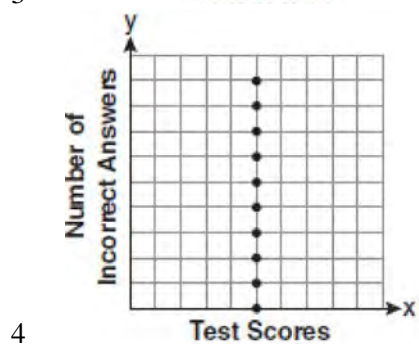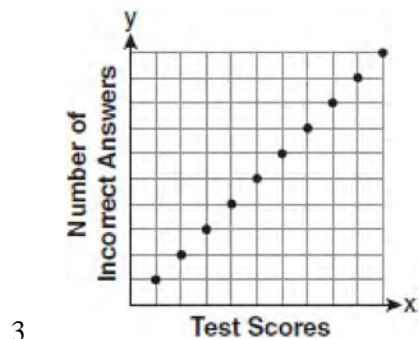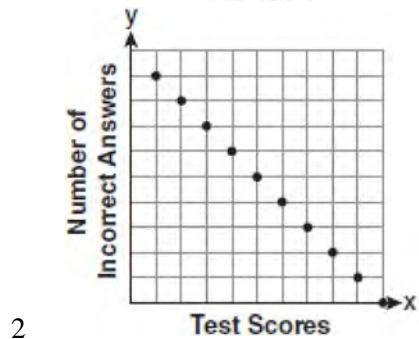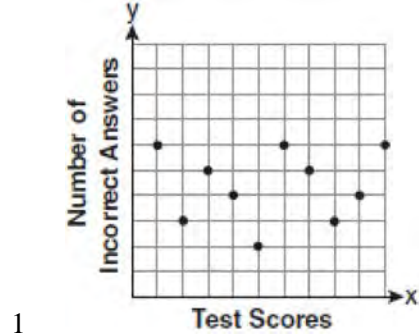
84 What is the relationship between the independent and dependent variables in the scatter plot shown below?
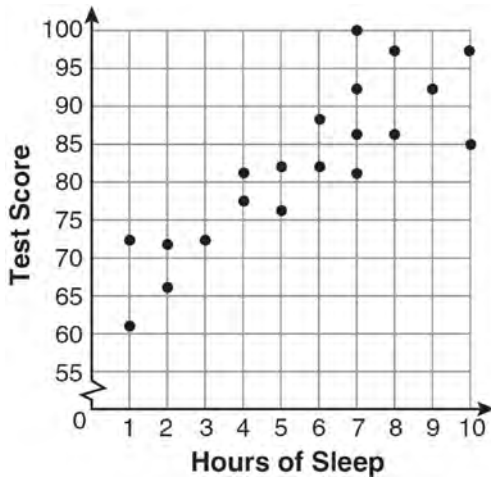
1 undefined correlation
2 negative correlation
3 positive correlation
4 no correlation

85 The scatter plot below represents the relationship between the number of peanuts a student eats and the student's bowling score.
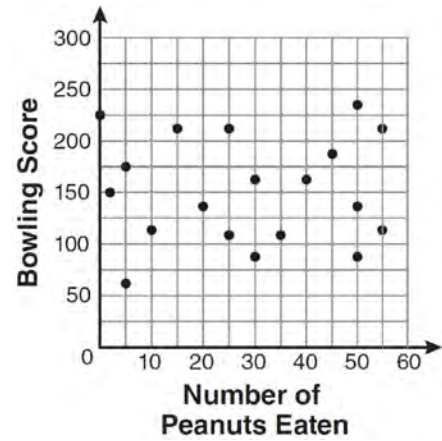
Which conclusion about the scatter plot is valid?
1 There is almost no relationship between eating peanuts and bowling score.
2 Students who eat more peanuts have higher bowling scores.
3 Students who eat more peanuts have lower bowling scores.
4 No bowlers eat peanuts.

86 A set of data is graphed on the scatter plot below.
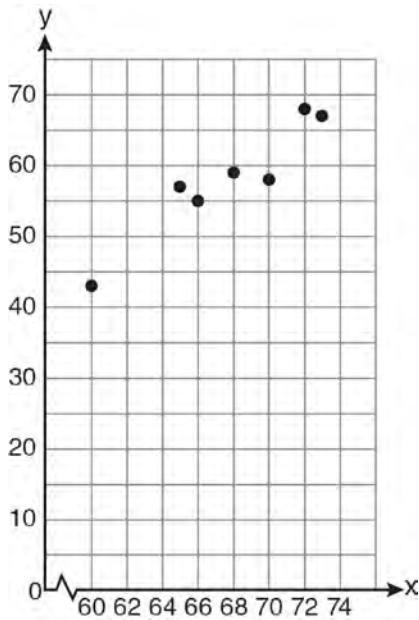
This scatter plot shows

1   no correlation
2   positive correlation
3   negative correlation
4   undefined correlation

87 The scatter plot shown below represents a relationship between *x* and *y*.
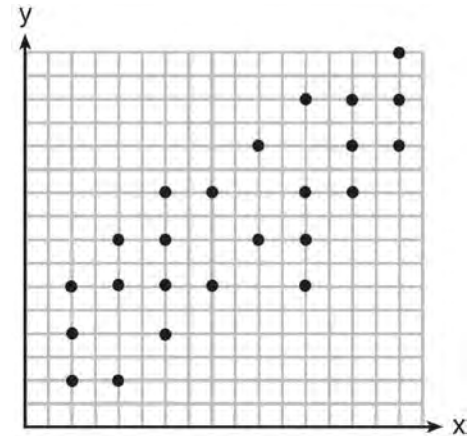
This type of relationship is
1   a positive correlation
2   a negative correlation
3   a zero correlation
4   not able to be determined

88 The number of hours spent on math homework during one week and the math exam grades for eleven students in Ms. Smith's algebra class are plotted below.

Ms. Smith's Class
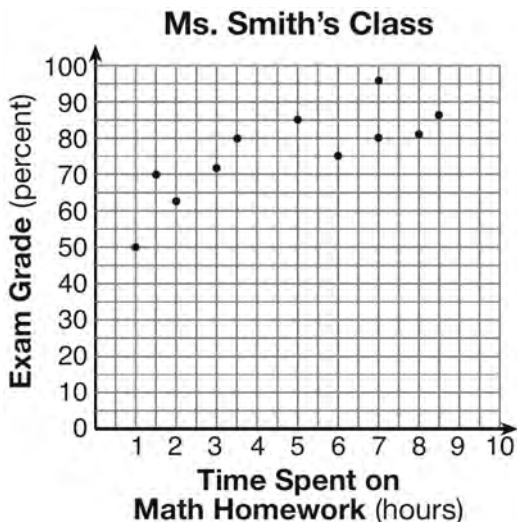
Based on the plotted data, what is the correlation between the time spent on homework and the exam grade?
1 positive
2 negative
3 no correlation
4 cannot be determined

89 Which situation describes a negative correlation?
1 the amount of gas left in a car's tank and the amount of gas used from it
2 the number of gallons of gas purchased and the amount paid for the gas
3 the size of a car's gas tank and the number of gallons it holds
4 the number of miles driven and the amount of gas used

A.S.17: SCATTER PLOTS

90 The number of hours spent on math homework each week and the final exam grades for twelve students in Mr. Dylan's algebra class are plotted below.

Mr. Dylan's Class
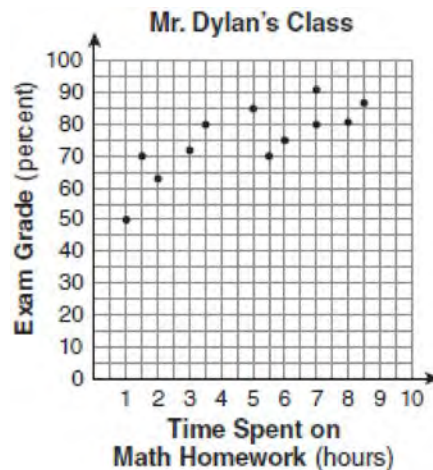
Based on a line of best fit, which exam grade is the best prediction for a student who spends about 4 hours on math homework each week?
1 62
2 72
3 82
4 92

19

91 Megan and Bryce opened a new store called the Donut Pit. Their goal is to reach a profit of $20,000 in their 18th month of business. The table and scatter plot below represent the profit, P, in thousands of dollars, that they made during the first 12 months.

t (months)	P (profit, in thousands of dollars)
1	3.0
2	2.5
3	4.0
4	5.0
5	6.5
6	5.5
7	7.0
8	6.0
9	7.5
10	7.0
11	9.0
12	9.5

Donut Pit Profits
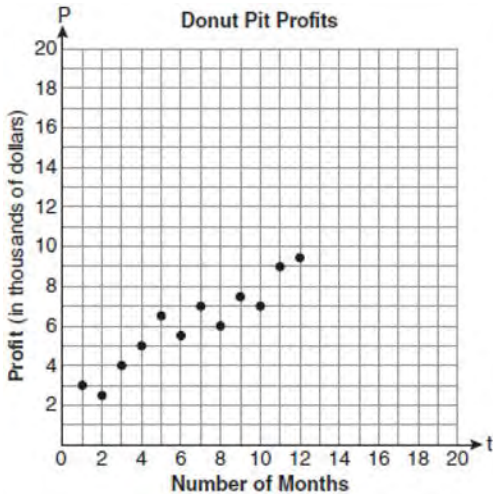
Draw a reasonable line of best fit. Using the line of best fit, predict whether Megan and Bryce will reach their goal in the 18th month of their business. Justify your answer.

92 The scatter plot below shows the profit, by month, for a new company for the first year of operation. Kate drew a line of best fit, as shown in the diagram.
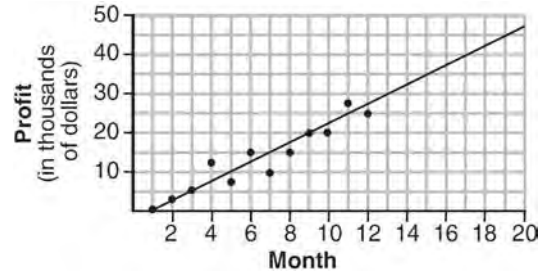
Using this line, what is the best estimate for profit in the 18th month?
1   $35,000
2   $37,750
3   $42,500
4   $45,000

93 Based on the line of best fit drawn below, which value could be expected for the data in June 2015?
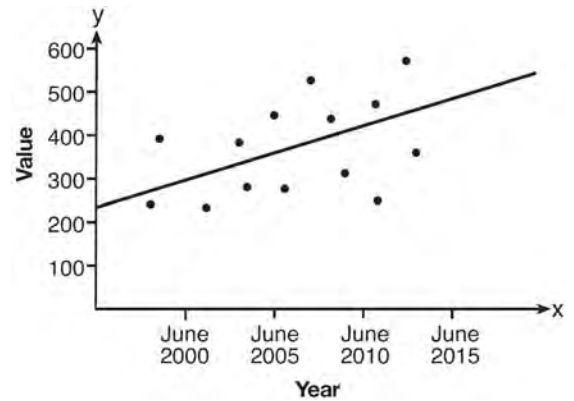
1   230
2   310
3   480
4   540

94 The graph below illustrates the number of acres used for farming in Smalltown, New York, over several years.
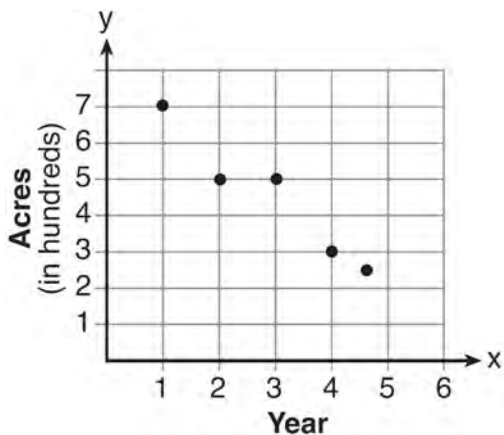
Using a line of best fit, approximately how many acres will be used for farming in the 5th year?
1   0
2   200
3   300
4   400

A.S.4: CENTRAL TENDENCY

95 The values of 11 houses on Washington St. are shown in the table below.

Value per House	Number of Houses
$100,000	1
$175,000	5
$200,000	4
$700,000	1

Find the mean value of these houses in dollars. Find the median value of these houses in dollars. State which measure of central tendency, the mean or the median, *best* represents the values of these 11 houses. Justify your answer.

96 The prices of seven race cars sold last week are listed in the table below.

Price per Race Car	Number of Race Cars
$126,000	1
$140,000	2
$180,000	1
$400,000	2
$819,000	1

What is the mean value of these race cars, in dollars? What is the median value of these race cars, in dollars? State which of these measures of central tendency best represents the value of the seven race cars. Justify your answer.

97 Which statement is true about the data set 3, 4, 5, 6, 7, 7, 10?
1   mean = mode
2   mean > mode
3   mean = median
4   mean < median

98 Alex earned scores of 60, 74, 82, 87, 87, and 94 on his first six algebra tests. What is the relationship between the measures of central tendency of these scores?
1   median < mode < mean
2   mean < mode < median
3   mode < median < mean
4   mean < median < mode

99 Sam's grades on eleven chemistry tests were 90, 85, 76, 63, 94, 89, 81, 76, 78, 69, and 97. Which statement is true about the measures of central tendency?
1   mean > mode
2   mean < median
3   mode > median
4   median = mean

21

100 Which statement is true about the data set 4, 5, 6, 6, 7, 9, 12?
1   mean = mode
2   mode = median
3   mean < median
4   mode > mean

A.S.16: CENTRAL TENDENCY

101 Ms. Mosher recorded the math test scores of six students in the table below.

Student	Student Score
Andrew	72
John	80
George	85
Amber	93
Betty	78
Roberto	80

Determine the mean of the student scores, to the *nearest tenth*. Determine the median of the student scores. Describe the effect on the mean and the median if Ms. Mosher adds 5 bonus points to each of the six students' scores.

102 Given the following list of students' scores on a quiz:
5, 12, 7, 15, 20, 14, 7
Determine the median of these scores. Determine the mode of these scores. The teacher decides to adjust these scores by adding three points to each score. Explain the effect, if any, that this will have on the median and mode of these scores.

103 Mr. Taylor raised all his students' scores on a recent test by five points. How were the mean and the range of the scores affected?
1   The mean increased by five and the range increased by five.
2   The mean increased by five and the range remained the same.
3   The mean remained the same and the range increased by five.
4   The mean remained the same and the range remained the same.

A.S.16: AVERAGE KNOWN WITH MISSING DATA

104 This year, John played in 10 baseball games. In these games he had hit the ball 2, 3, 0, 1, 3, 2, 4, 0, 2, and 3 times. In the first 10 games he plays next year, John wants to increase his average (mean) hits per game by 0.5. What is the total number of hits John needs over the first 10 games next year to achieve his goal?
1   5
2   2
3   20
4   25

A.S.1: ANALYSIS OF DATA

105 Which data set describes a situation that could be classified as qualitative?
1   the elevations of the five highest mountains in the world
2   the ages of presidents at the time of their inauguration
3   the opinions of students regarding school lunches
4   the shoe sizes of players on the basketball team

106 Which data set describes a situation that could be classified as qualitative?
1 the ages of the students in Ms. Marshall's Spanish class
2 the test scores of the students in Ms. Fitzgerald's class
3 the favorite ice cream flavor of each of Mr. Hayden's students
4 the heights of the players on the East High School basketball team

107 Which data set describes a situation that could be classified as quantitative?
1 the phone numbers in a telephone book
2 the addresses for students at Hopkins High School
3 the zip codes of residents in the city of Buffalo, New York
4 the time it takes each of Mr. Harper's students to complete a test

108 Which set of data can be classified as qualitative?
1 scores of students in an algebra class
2 ages of students in a biology class
3 numbers of students in history classes
4 eye colors of students in an economics class

109 Which set of data can be classified as quantitative?
1 first names of students in a chess club
2 ages of students in a government class
3 hair colors of students in a debate club
4 favorite sports of students in a gym class

110 Craig sees an advertisement for a car in a newspaper. Which information would *not* be classified as quantitative?
1 the cost of the car
2 the car's mileage
3 the model of the car
4 the weight of the car

111 Which set of data describes a situation that could be classified as qualitative?
1 the colors of the birds at the city zoo
2 the shoe size of the zookeepers at the city zoo
3 the heights of the giraffes at the city zoo
4 the weights of the monkeys at the city zoo

112 An art studio has a list of information posted with each sculpture that is for sale. Each entry in the list could be classified as quantitative *except* for the
1 cost
2 height
3 artist
4 weight

113 Which data can be classified as quantitative?
1 favorite stores at which you shop
2 U.S. Representatives and their home states
3 sales tax rate in each New York county
4 opinion of a freshman on the color of Paul's shirt

A.S.2: ANALYSIS OF DATA

114 Which situation should be analyzed using bivariate data?
1 Ms. Saleem keeps a list of the amount of time her daughter spends on her social studies homework.
2 Mr. Benjamin tries to see if his students' shoe sizes are directly related to their heights.
3 Mr. DeStefan records his customers' best video game scores during the summer.
4 Mr. Chan keeps track of his daughter's algebra grades for the quarter.

115 Which data table represents univariate data?

1

Side Length of a Square	Area of Square
2	4
3	9
4	16
5	25

2

Hours Worked	Pay
20	$160
25	$200
30	$240
35	$280

3

Age Group	Frequency
20–29	9
30–39	7
40–49	10
50–59	4

4

People	Number of Fingers
2	20
3	30
4	40
5	50

116 Which table does *not* show bivariate data?

1

Height (inches)	Weight (pounds)
39	50
48	70
60	90

2

Gallons	Miles Driven
15	300
20	400
25	500

3

Quiz Average	Frequency
70	12
80	15
90	6

4

Speed (mph)	Distance (miles)
40	80
50	120
55	150

117 Which situation is an example of bivariate data?
1 the number of pizzas Tanya eats during her years in high school
2 the number of times Ezra puts air,in his bicycle tires during the summer
3 the number of home runs Elias hits per game and the number of hours he practices baseball
4 the number of hours Nellie studies for her mathematics tests during the first half of the school year

118 Which table shows bivariate data?

Age (yr)	Frequency
14	12
15	21
16	14
17	19
18	15

1

Type of Car	Average Gas Mileage (mpg)
van	25
SUV	23
luxury	26
compact	28
pickup	22

2

Time Spent Studying (hr)	Test Grade (%)
1	65
2	72
3	83
4	85
5	92

3

Day	Temperature (degrees F)
Monday	63
Tuesday	58
Wednesday	72
Thursday	74
Friday	78

4

A.S.3: ANALYSIS OF DATA

119 A school wants to add a coed soccer program. To determine student interest in the program, a survey will be taken. In order to get an unbiased sample, which group should the school survey?
1 every third student entering the building
2 every member of the varsity football team
3 every member in Ms. Zimmer's drama classes
4 every student having a second-period French class

120 A survey is being conducted to determine which types of television programs people watch. Which survey and location combination would likely contain the most bias?
1 surveying 10 people who work in a sporting goods store
2 surveying the first 25 people who enter a grocery store
3 randomly surveying 50 people during the day in a mall
4 randomly surveying 75 people during the day in a clothing store

121 Erica is conducting a survey about the proposed increase in the sports budget in the Hometown School District. Which survey method would likely contain the most bias?
1 Erica asks every third person entering the Hometown Grocery Store.
2 Erica asks every third person leaving the Hometown Shopping Mall this weekend.
3 Erica asks every fifth student entering Hometown High School on Monday morning.
4 Erica asks every fifth person leaving Saturday's Hometown High School football game.

122 Four hundred licensed drivers participated in the math club's survey on driving habits. The table below shows the number of drivers surveyed in each age group.

Ages of People in Survey on Driving Habits

Age Group	Number of Drivers
16–25	150
26–35	129
36–45	33
46–55	57
56–65	31

Which statement best describes a conclusion based on the data in the table?
1 It may be biased because no one younger than 16 was surveyed.
2 It would be fair because many different age groups were surveyed.
3 It would be fair because the survey was conducted by the math club students.
4 It may be biased because the majority of drivers surveyed were in the younger age intervals.

123 A survey is being conducted to determine which school board candidate would best serve the Yonkers community. Which group, when randomly surveyed, would likely produce the most bias?
1 15 employees of the Yonkers school district
2 25 people driving past Yonkers High School
3 75 people who enter a Yonkers grocery store
4 100 people who visit the local Yonkers shopping mall

124 A survey is being conducted to determine if a cable company should add another sports channel to their schedule. Which random survey would be the least biased?
1 surveying 30 men at a gym
2 surveying 45 people at a mall
3 surveying 50 fans at a football game
4 surveying 20 members of a high school soccer team

125 A school newspaper will survey students about the quality of the school's lunch program. Which method will create the *least* biased results?
1 Twenty-five vegetarians are randomly surveyed.
2 Twenty-five students are randomly chosen from each grade level.
3 Students who dislike the school's lunch program are chosen to complete the survey.
4 A booth is set up in the cafeteria for the students to voluntarily complete the survey.

126 Which statement regarding biased sampling is *false*?
1 Online sampling is biased because only the people who happen to visit the web site will take the survey.
2 A radio call-in survey is biased because only people who feel strongly about the topic will respond.
3 A survey handed to every third person leaving a library is biased because everyone leaving the library was not asked to participate.
4 Asking for experts to take a survey is biased because they may have particular knowledge of the topic.

A.S.13: ANALYSIS OF DATA

127 Which relationship can best be described as causal?
1 height and intelligence
2 shoe size and running speed
3 number of correct answers on a test and test score
4 number of students in a class and number of students with brown hair

128 Which situation does *not* describe a causal relationship?
1 The higher the volume on a radio, the louder the sound will be.
2 The faster a student types a research paper, the more pages the paper will have.
3 The shorter the distance driven, the less gasoline that will be used.
4 The slower the pace of a runner, the longer it will take the runner to finish the race.

A.S.14: ANALYSIS OF DATA

129 Which situation describes a correlation that is *not* a causal relationship?
1 The rooster crows, and the Sun rises.
2 The more miles driven, the more gasoline needed
3 The more powerful the microwave, the faster the food cooks.
4 The faster the pace of a runner, the quicker the runner finishes.

130 Which situation describes a correlation that is *not* a causal relationship?
1 the length of the edge of a cube and the volume of the cube
2 the distance traveled and the time spent driving
3 the age of a child and the number of siblings the child has
4 the number of classes taught in a school and the number of teachers employed

131 Which phrase best describes the relationship between the number of miles driven and the amount of gasoline used?
1 causal, but not correlated
2 correlated, but not causal
3 both correlated and causal
4 neither correlated nor causal

132 A study showed that a decrease in the cost of carrots led to an increase in the number of carrots sold. Which statement best describes this relationship?
1 positive correlation and a causal relationship
2 negative correlation and a causal relationship
3 positive correlation and not a causal relationship
4 negative correlation and not a causal relationship

A.M.3: ERROR

133 The groundskeeper is replacing the turf on a football field. His measurements of the field are 130 yards by 60 yards. The actual measurements are 120 yards by 54 yards. Which expression represents the relative error in the measurement?

1 $\dfrac{(130)(60) - (120)(54)}{(120)(54)}$

2 $\dfrac{(120)(54)}{(130)(60) - (120)(54)}$

3 $\dfrac{(130)(60) - (120)(54)}{(130)(60)}$

4 $\dfrac{(130)(60)}{(130)(60) - (120)(54)}$

134 Sophie measured a piece of paper to be 21.7 cm by 28.5 cm. The piece of paper is actually 21.6 cm by 28.4 cm. Determine the number of square centimeters in the area of the piece of paper using Sophie's measurements. Determine the number of square centimeters in the actual area of the piece of paper. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*. Sophie does not think there is a significant amount of error. Do you agree or disagree? Justify your answer.

135 Ryan estimates the measurement of the volume of a popcorn container to be 282 cubic inches. The actual volume of the popcorn container is 289 cubic inches. What is the relative error of Ryan's measurement to the *nearest thousandth*?
1 0.024
2 0.025
3 0.096
4 1.025

136 Sarah measures her rectangular bedroom window for a new shade. Her measurements are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Using the measurements that Sarah took, determine the number of square inches in the area of the window. Determine the number of square inches in the actual area of the window. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

137 To calculate the volume of a small wooden cube, Ezra measured an edge of the cube as 2 cm. The actual length of the edge of Ezra's cube is 2.1 cm. What is the relative error in his volume calculation to the *nearest hundredth*?
1   0.13
2   0.14
3   0.15
4   0.16

138 Carrie bought new carpet for her living room. She calculated the area of the living room to be 174.2 square feet. The actual area was 149.6 square feet. What is the relative error of the area to the *nearest ten-thousandth*?
1   0.1412
2   0.1644
3   1.8588
4   2.1644

139 Using his ruler, Howell measured the sides of a rectangular prism to be 5 cm by 8 cm by 4 cm. The actual measurements are 5.3 cm by 8.2 cm by 4.1 cm. Find Howell's relative error in calculating the volume of the prism, to the *nearest thousandth*.

140 Alexis calculates the surface area of a gift box as 600 square inches. The actual surface area of the gift box is 592 square inches. Find the relative error of Alexis' calculation expressed as a decimal to the *nearest thousandth*.

141 Corinne calculated the area of a paper plate to be 50.27 square inches. If the actual area of the plate is 55.42 square inches, what is the relative error in calculating the area, to the *nearest thousandth*?
1   0.092
2   0.093
3   0.102
4   0.103

142 An oil company distributes oil in a metal can shaped like a cylinder that has an actual radius of 5.1 cm and a height of 15.1 cm. A worker incorrectly measured the radius as 5 cm and the height as 15 cm. Determine the relative error in calculating the surface area, to the *nearest thousandth*.

143 The dimensions of a rectangle are measured to be 12.2 inches by 11.8 inches. The actual dimensions are 12.3 inches by 11.9 inches. What is the relative error, to the *nearest ten-thousandth*, in calculating the area of the rectangle?
1   0.0168
2   0.0167
3   0.0165
4   0.0164

144 Jack wants to replace the flooring in his rectangular kitchen. He calculates the area of the floor to be 12.8 square meters. The actual area of the floor is 13.5 square meters. What is the relative error in calculating the area of the floor, to the *nearest thousandth*?
1   0.051
2   0.052
3   0.054
4   0.055

145 The actual dimensions of a rectangle are 2.6 cm by 6.9 cm. Andy measures the sides as 2.5 cm by 6.8 cm. In calculating the area, what is the relative error, to the *nearest thousandth*?
1   0.055
2   0.052
3   0.022
4   0.021

146 Students calculated the area of a playing field to be 8,100 square feet. The actual area of the field is 7,678.5 square feet. Find the relative error in the area, to the *nearest thousandth*.

147 Ashley measured the dimensions of a rectangular prism to be 6 cm by 10 cm by 1.5 cm. The actual dimensions are 5.9 cm by 10.3 cm by 1.7 cm. Determine the relative error, to the *nearest thousandth*, in calculating the volume of the prism.

148 Wendy measures the floor in her rectangular bedroom for new carpeting. Her measurements are 24 feet by 14 feet. The actual measurements are 24.2 feet by 14.1 feet. Determine the relative error in calculating the area of her bedroom. Express your answer as a decimal to the *nearest thousandth*.

149 Janis measures the dimensions of the floor in her rectangular classroom for a rug. Her measurements are 10.50 feet by 12.25 feet. The actual measurements of the floor are 10.75 feet by 12.50 feet. Determine the relative error in calculating the area, to the *nearest thousandth*.

150 Terry estimated the length of the edge of a cube to be 5 cm. The actual length of the side is 5.2 cm. Find the relative error of the surface area of the cube, to the *nearest thousandth*.

PROBABILITY
A.S.19: SAMPLE SPACE

151 Mr. Laub has three children: two girls (Sue and Karen) and one boy (David). After each meal, one child is chosen at random to wash dishes. If the same child can be chosen for both lunch and dinner, construct a tree diagram or list a sample space of all the possible outcomes of who will wash dishes after lunch and dinner on Saturday. Determine the probability that one boy and one girl will wash dishes after lunch and dinner on Saturday.

152 A restaurant sells kids' meals consisting of one main course, one side dish, and one drink, as shown in the table below.

Kids' Meal Choices

Main Course	Side Dish	Drink
hamburger	French fries	milk
chicken nuggets	applesauce	juice
turkey sandwich		soda

Draw a tree diagram or list the sample space showing all possible kids' meals. How many different kids' meals can a person order? Jose does not drink juice. Determine the number of different kids' meals that do *not* include juice. Jose's sister will eat *only* chicken nuggets for her main course. Determine the number of different kids' meals that include chicken nuggets.

153 Clayton has three fair coins. Find the probability that he gets two tails and one head when he flips the three coins.

154 An outfit Jennifer wears to school consists of a top, a bottom, and shoes. Possible choices are listed below.
Tops: T-shirt, blouse, sweater
Bottoms: jeans, skirt, capris
Shoes: flip-flops, sneakers
List the sample space or draw a tree diagram to represent all possible outfits consisting of one type of top, one type of bottom, and one pair of shoes. Determine how many different outfits contain jeans and flip-flops. Determine how many different outfits do *not* include a sweater.

155 A sandwich consists of one type of bread, one type of meat, and one type of cheese. The possible choices are listed below.

> Bread: white, rye
> Meat: ham, turkey, beef
> Cheese: American, Swiss

Draw a tree diagram or list a sample space of all the possible different sandwiches consisting of one type of bread, one type of meat, and one type of cheese. Determine the number of sandwiches that will *not* include turkey. Determine the number of sandwiches that will include rye bread and Swiss cheese.

156 A company is running a contest and offering a first, second, and third prize. First prize is a choice of a car or $15,000 cash. Second prize is a choice of a motorbike, a trip to New York City, or $2,000 cash. Third prize is a choice of a television or $500 cash. If each prize is equally likely to be selected, list the sample space or draw a tree diagram of *all* possible different outcomes of first, second, and third prizes. Determine the number of ways that *all* three prizes selected could be cash. Determine the number of ways that *none* of the three prizes selected could be cash.

157 In a game, a player must spin each spinner shown in the diagram below once.
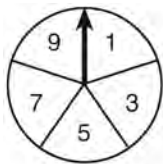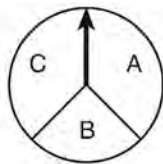
Spinner 1   Spinner 2

Draw a tree diagram or list a sample space showing all possible outcomes. Determine the number of outcomes that consist of a prime number and a letter in the word "CAT."

158 A cube, with faces numbered 1 to 6, is rolled, and a penny is tossed at the same time. How many elements in the sample space consist of an even number and a tail?
1   12
2   2
3   3
4   4

159 Doug has four baseball caps: one tan, one blue, one red, and one green. He also has three jackets: one blue, one red, and one white. Draw a tree diagram or list a sample space to show all possible outfits consisting of one baseball cap and one jacket. Find the number of Doug's outfits that consist of a cap and a jacket that are different colors. On Spirit Day, Doug wants to wear either green or white, his school's colors. Find the number of his outfits from which he can choose.

A.S.21: EXPERIMENTAL PROBABILITY

160 Students in Ms. Nazzeer's mathematics class tossed a six-sided number cube whose faces are numbered 1 to 6. The results are recorded in the table below.

Result	Frequency
1	3
2	6
3	4
4	6
5	4
6	7

Based on these data, what is the empirical probability of tossing a 4?

1 $\frac{8}{30}$

2 $\frac{6}{30}$

3 $\frac{5}{30}$

4 $\frac{1}{30}$

161 Three high school juniors, Reese, Matthew, and Chris, are running for student council president. A survey is taken a week before the election asking 40 students which candidate they will vote for in the election. The results are shown in the table below.

Candidate's Name	Number of Students Supporting Candidate
Reese	15
Matthew	13
Chris	12

Based on the table, what is the probability that a student will vote for Reese?

1 $\frac{1}{3}$

2 $\frac{3}{5}$

3 $\frac{3}{8}$

4 $\frac{5}{8}$

162 A spinner that is equally divided into eight numbered sectors is spun 20 times. The table below shows the number of times the arrow landed in each numbered sector.

Spinner Sector	Number of Times
1	2
2	3
3	2
4	3
5	4
6	2
7	3
8	1

Based on the table, what is the empirical probability that the spinner will land on a prime number on the next spin?

1 $\frac{9}{20}$

2 $\frac{11}{20}$

3 $\frac{12}{20}$

4 $\frac{14}{20}$

163 Casey purchased a pack of assorted flower seeds and planted them in her garden. When the first 25 flowers bloomed, 11 were white, 5 were red, 3 were blue, and the rest were yellow. Find the empirical probability that a flower that blooms will be yellow.

164 Two cubes with sides numbered 1 through 6 were rolled 20 times. Their sums are recorded in the table below.

4	9	8	9	2
9	4	6	12	10
8	7	9	11	10
8	7	9	3	5

What is the empirical probability of rolling a sum of 9?

1 $\frac{4}{20}$

2 $\frac{5}{20}$

3 $\frac{4}{36}$

4 $\frac{5}{36}$

A.S.20: THEORETICAL PROBABILITY

165 A bag contains eight green marbles, five white marbles, and two red marbles. What is the probability of drawing a red marble from the bag?

1 $\frac{1}{15}$

2 $\frac{2}{15}$

3 $\frac{2}{13}$

4 $\frac{13}{15}$

A.S.22: THEORETICAL PROBABILITY

166 The faces of a cube are numbered from 1 to 6. If the cube is rolled once, which outcome is *least* likely to occur?
1 rolling an odd number
2 rolling an even number
3 rolling a number less than 6
4 rolling a number greater than 4

167 Jon is buying tickets for himself for two concerts. For the jazz concert, 4 tickets are available in the front row, and 32 tickets are available in the other rows. For the orchestra concert, 3 tickets are available in the front row, and 23 tickets are available in the other rows. Jon is randomly assigned one ticket for each concert. Determine the concert for which he is more likely to get a front-row ticket. Justify your answer.

168 Each of the hats shown below has colored marbles placed inside. Hat *A* contains five green marbles and four red marbles. Hat *B* contains six blue marbles and five red marbles. Hat C contains five green marbles and five blue marbles.

Hat A   Hat B   Hat C

If a student were to randomly pick one marble from each of these three hats, determine from which hat the student would most likely pick a green marble. Justify your answer. Determine the fewest number of marbles, if any, and the color of these marbles that could be added to *each* hat so that the probability of picking a green marble will be one-half in each of the three hats.

169 Maria has a set of 10 index cards labeled with the digits 0 through 9. She puts them in a bag and selects one at random. The outcome that is most likely to occur is selecting
1   an odd number
2   a prime number
3   a number that is at most 5
4   a number that is divisible by 3

170 Three storage bins contain colored blocks. Bin 1 contains 15 red and 14 blue blocks. Bin 2 contains 16 white and 15 blue blocks. Bin 3 contains 15 red and 15 white blocks. All of the blocks from the three bins are placed into one box. If one block is randomly selected from the box, which color block would most likely be picked? Justify your answer.

171 A cube with faces numbered 1 through 6 is rolled 75 times, and the results are given in the table below.

Number	Frequency
1	7
2	22
3	14
4	6
5	20
6	6

Based on these results, which statement is true?
1    $P(\text{odd}) < P(\text{even})$
2    $P(3 \text{ or less}) < P(\text{odd})$
3    $P(\text{even}) < P(2 \text{ or } 4)$
4    $P(2 \text{ or } 4) < P(3 \text{ or less})$

172 Which event is certain to happen?
1   Everyone walking into a room will have red hair.
2   All babies born in June will be males.
3   The Yankees baseball team will win the World Series.
4   The Sun will rise in the east.

A.S.23: THEORETICAL PROBABILITY

173 Throughout history, many people have contributed to the development of mathematics. These mathematicians include Pythagoras, Euclid, Hypatia, Euler, Einstein, Agnesi, Fibonacci, and Pascal. What is the probability that a mathematician's name selected at random from those listed will start with either the letter E or the letter A?

1   $\frac{2}{8}$

2   $\frac{3}{8}$

3   $\frac{4}{8}$

4   $\frac{6}{8}$

174 The faces of a cube are numbered from 1 to 6. If the cube is tossed once, what is the probability that a prime number or a number divisible by 2 is obtained?

1   $\frac{6}{6}$

2   $\frac{5}{6}$

3   $\frac{4}{6}$

4   $\frac{1}{6}$

175 The probability that it will snow on Sunday is $\frac{3}{5}$. The probability that it will snow on both Sunday and Monday is $\frac{3}{10}$. What is the probability that it will snow on Monday, if it snowed on Sunday?

1   $\frac{9}{50}$

2   2

3   $\frac{1}{2}$

4   $\frac{9}{10}$

176 Vince buys a box of candy that consists of six chocolate pieces, four fruit-flavored pieces, and two mint pieces. He selects three pieces of candy at random, without replacement. Calculate the probability that the first piece selected will be fruit flavored and the other two will be mint. Calculate the probability that all three pieces selected will be the same type of candy.

177 Three fair coins are tossed. What is the probability that two heads and one tail appear?

1   $\frac{1}{8}$

2   $\frac{3}{8}$

3   $\frac{3}{6}$

4   $\frac{2}{3}$

178 The probability it will rain tomorrow is $\frac{1}{2}$. The probability that our team will win tomorrow's basketball game is $\frac{3}{5}$. Which expression represents the probability that it will rain and that our team will *not* win the game?

1   $\frac{1}{2} + \frac{3}{5}$

2   $\frac{1}{2} + \frac{2}{5}$

3   $\frac{1}{2} \times \frac{3}{5}$

4   $\frac{1}{2} \times \frac{2}{5}$

179 A jar contains five red marbles and three green marbles. A marble is drawn at random and not replaced. A second marble is then drawn from the jar. Find the probability that the first marble is red and the second marble is green. Find the probability that both marbles are red. Find the probability that both marbles are the same color.

180   A bottle contains 12 red marbles and 8 blue marbles. A marble is chosen at random and not replaced. Then, a second marble is chosen at random. Determine the probability that the two marbles are *not* the same color. Determine the probability that *at least* one of the marbles is red.

A.S.20: GEOMETRIC PROBABILITY

181   The spinner below is divided into eight equal regions and is spun once. What is the probability of *not* getting red?
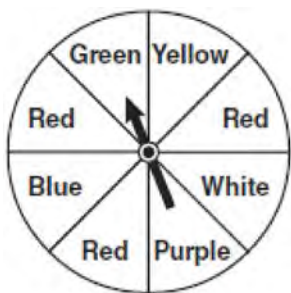
1   $\frac{3}{5}$

2   $\frac{3}{8}$

3   $\frac{5}{8}$

4   $\frac{7}{8}$

182   The square dart board shown below has a side that measures 40 inches. The shaded portion in the center is a square whose side is 15 inches. A dart thrown at the board is equally likely to land on any point on the dartboard.
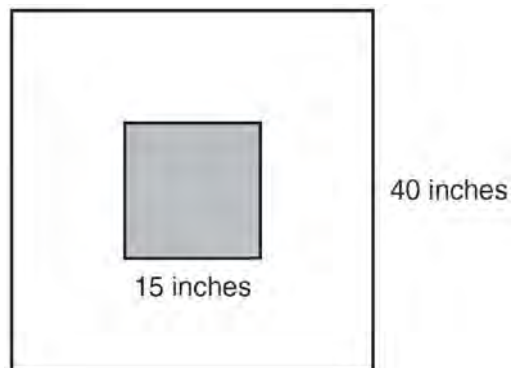
40 inches

15 inches

Find the probability that a dart hitting the board will *not* land in the shaded area.

183 The bull's-eye of a dartboard has a radius of 2 inches and the entire board has a radius of 9 inches, as shown in the diagram below.
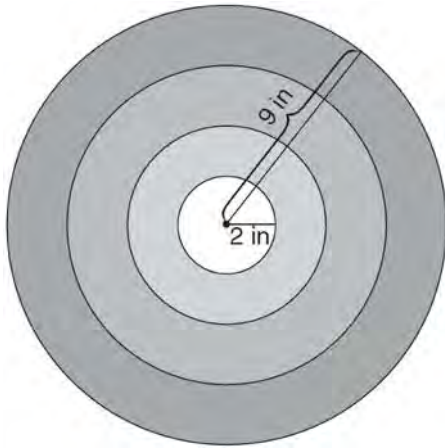
If a dart is thrown and hits the board, what is the probability that the dart will land in the bull's-eye?

1 $\frac{2}{9}$

2 $\frac{7}{9}$

3 $\frac{4}{81}$

4 $\frac{49}{81}$

A.S.22: GEOMETRIC PROBABILITY

184 A spinner is divided into eight equal regions as shown in the diagram below.
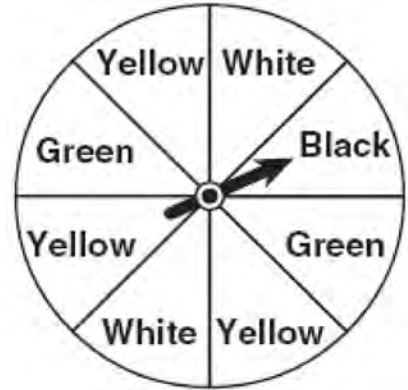
Which event is most likely to occur in one spin?
1 The arrow will land in a green or white area.
2 The arrow will land in a green or black area.
3 The arrow will land in a yellow or black area.
4 The arrow will land in a yellow or green area.

185 The spinner shown in the diagram below is divided into six equal sections.
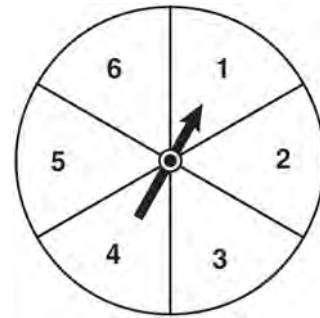
Which outcome is *least* likely to occur on a single spin?
1 an odd number
2 a prime number
3 a perfect square
4 a number divisible by 2

A.S.23: GEOMETRIC PROBABILITY

186 Brianna is using the two spinners shown below to play her new board game. She spins the arrow on each spinner once. Brianna uses the first spinner to determine how many spaces to move. She uses the second spinner to determine whether her move from the first spinner will be forward or backward.

Find the probability that Brianna will move *fewer than* four spaces and *backward*.

187 Keisha is playing a game using a wheel divided into eight equal sectors, as shown in the diagram below. Each time the spinner lands on orange, she will win a prize.
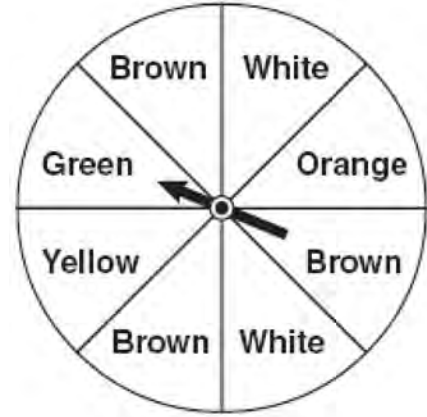
If Keisha spins this wheel twice, what is the probability she will win a prize on *both* spins?

1   $\dfrac{1}{64}$

2   $\dfrac{1}{56}$

3   $\dfrac{1}{16}$

4   $\dfrac{1}{4}$

A.S.18: CONDITIONAL PROBABILITY

188 Some books are laid on a desk. Two are English, three are mathematics, one is French, and four are social studies. Theresa selects an English book and Isabelle then selects a social studies book. Both girls take their selections to the library to read. If Truman then selects a book at random, what is the probability that he selects an English book?

189 A bag contains five green gumdrops and six red gumdrops. If Kim pulls a green gumdrop out of the bag and eats it, what is the probability that the next gumdrop she pulls out will be red?

1 $\dfrac{5}{11}$

2 $\dfrac{5}{10}$

3 $\dfrac{6}{11}$

4 $\dfrac{6}{10}$

190 Gabriella has 20 quarters, 15 dimes, 7 nickels, and 8 pennies in a jar. After taking 6 quarters out of the jar, what will be the probability of Gabriella randomly selecting a quarter from the coins left in the jar?

1 $\dfrac{14}{44}$

2 $\dfrac{30}{44}$

3 $\dfrac{14}{50}$

4 $\dfrac{20}{50}$

A.N.7: MULTIPLICATION COUNTING PRINCIPLE

191 The local ice cream stand offers three flavors of soft-serve ice cream: vanilla, chocolate, and strawberry; two types of cone: sugar and wafer; and three toppings: sprinkles, nuts, and cookie crumbs. If Dawn does not order vanilla ice cream, how many different choices can she make that have one flavor of ice cream, one type of cone, and one topping?

1 7
2 8
3 12
4 18

192 How many different sandwiches consisting of one type of cheese, one condiment, and one bread choice can be prepared from five types of cheese, two condiments, and three bread choices?

1 10
2 13
3 15
4 30

193 The menu for the high school cafeteria is shown below.

Main Course	Vegetable	Dessert	Beverage
veggie burger	corn	gelatin	milk
pizza	green beans	fruit salad	juice
tuna sandwich	carrots	yogurt	bottled water
frankfurter		cookie	
chicken tenders		ice cream cup	

Determine the number of possible meals consisting of a main course, a vegetable, a dessert, and a beverage that can be selected from the menu. Determine how many of these meals will include chicken tenders. If a student chooses pizza, corn or carrots, a dessert, and a beverage from the menu, determine the number of possible meals that can be selected.

A.N.8: PERMUTATIONS

194 The bowling team at Lincoln High School must choose a president, vice president, and secretary. If the team has 10 members, which expression could be used to determine the number of ways the officers could be chosen?

1 $_3P_{10}$
2 $_7P_3$
3 $_{10}P_3$
4 $_{10}P_7$

195 John is going to line up his four golf trophies on a shelf in his bedroom. How many different possible arrangements can he make?
1   24
2   16
3   10
4   4

196 Determine how many three-letter arrangements are possible with the letters *A*, *N*, *G*, *L*, and *E* if no letter may be repeated.

197 A password consists of three digits, 0 through 9, followed by three letters from an alphabet having 26 letters. If repetition of digits is allowed, but repetition of letters is not allowed, determine the number of different passwords that can be made. If repetition is not allowed for digits or letters, determine how many fewer different passwords can be made.

198 How many different three-letter arrangements can be formed using the letters in the word *ABSOLUTE* if each letter is used only once?
1   56
2   112
3   168
4   336

199 How many different four-letter arrangements are possible with the letters G, A, R, D, E, N if each letter may be used only once?
1   15
2   24
3   360
4   720

200 How many different ways can five books be arranged on a shelf?
1   5
2   15
3   25
4   120

201 A large company must chose between two types of passwords to log on to a computer. The first type is a four-letter password using any of the 26 letters of the alphabet, without repetition of letters. The second type is a six-digit password using the digits 0 through 9, with repetition of digits allowed. Determine the number of possible four-letter passwords. Determine the number of possible six-digit passwords. The company has 500,000 employees and needs a different password for each employee. State which type of password the company should choose. Explain your answer.

202 There are 18 students in a class. Each day, the teacher randomly selects three students to assist in a game: a leader, a recorder, and a timekeeper. In how many possible ways can the jobs be assigned?
1   306
2   816
3   4896
4   5832

EXPRESSIONS AND EQUATIONS
A.A.1: EXPRESSIONS

203 Mr. Turner bought *x* boxes of pencils. Each box holds 25 pencils. He left 3 boxes of pencils at home and took the rest to school. Which expression represents the total number of pencils he took to school?
1   $22x$
2   $25x - 3$
3   $25 - 3x$
4   $25x - 75$

204 The length of a rectangular room is 7 less than three times the width, *w*, of the room. Which expression represents the area of the room?
1   $3w - 4$
2   $3w - 7$
3   $3w^2 - 4w$
4   $3w^2 - 7w$

205 Marie currently has a collection of 58 stamps. If she buys s stamps each week for w weeks, which expression represents the total number of stamps she will have?
1   $58sw$
2   $58 + sw$
3   $58s + w$
4   $58 + s + w$

206 What is the perimeter of a regular pentagon with a side whose length is $x + 4$?
1   $x^2 + 16$
2   $4x + 16$
3   $5x + 4$
4   $5x + 20$

207 Tim ate four more cookies than Alice. Bob ate twice as many cookies as Tim. If x represents the number of cookies Alice ate, which expression represents the number of cookies Bob ate?
1   $2 + (x + 4)$
2   $2x + 4$
3   $2(x + 4)$
4   $4(x + 2)$

208 Which algebraic expression represents 15 less than x divided by 9?
1   $\dfrac{x}{9} - 15$
2   $9x - 15$
3   $15 - \dfrac{x}{9}$
4   $15 - 9x$

209 Timmy bought a skateboard and two helmets for a total of d dollars. If each helmet cost h dollars, the cost of the skateboard could be represented by
1   $2dh$
2   $\dfrac{dh}{2}$
3   $d - 2h$
4   $d - \dfrac{h}{2}$

210 Marcy determined that her father's age is four less than three times her age. If x represents Marcy's age, which expression represents her father's age?
1   $3x - 4$
2   $3(x - 4)$
3   $4x - 3$
4   $4 - 3x$

211 A correct translation of "six less than twice the value of x" is
1   $2x < 6$
2   $2x - 6$
3   $6 < 2x$
4   $6 - 2x$

212 If Angelina's weekly allowance is d dollars, which expression represents her allowance, in dollars, for x weeks?
1   dx
2   $7dx$
3   $x + 7d$
4   $\dfrac{d}{x}$

213 Which expression represents "5 less than twice x"?
1   $2x - 5$
2   $5 - 2x$
3   $2(5 - x)$
4   $2(x - 5)$

214 Which expression represents the number of hours in w weeks and d days?
1   $7w + 12d$
2   $84w + 24d$
3   $168w + 24d$
4   $168w + 60d$

215 Marie currently has a collection of 58 stamps. If she buys s stamps each week for w weeks, which expression represents the total number of stamps she will have?
1   $58sw$
2   $58 + sw$
3   $58s + w$
4   $58 + s + w$

216 Julie has three children whose ages are consecutive odd integers. If x represents the youngest child's age, which expression represents the sum of her children's ages?
1 $3x + 3$
2 $3x + 4$
3 $3x + 5$
4 $3x + 6$

A.A.2: EXPRESSIONS

217 Which verbal expression represents $2(n - 6)$?
1 two times n minus six
2 two times six minus n
3 two times the quantity n less than six
4 two times the quantity six less than n

218 Which verbal expression is represented by $\frac{1}{2}(n - 3)$?
1 one-half n decreased by 3
2 one-half n subtracted from 3
3 the difference of one-half n and 3
4 one-half the difference of n and 3

219 Which verbal expression can be represented by $2(x - 5)$?
1 5 less than 2 times x
2 2 multiplied by x less than 5
3 twice the difference of x and 5
4 the product of 2 and x, decreased by 5

220 Which verbal expression is represented by $2(x + 4)$?
1 twice the sum of a number and four
2 the sum of two times a number and four
3 two times the difference of a number and four
4 twice the product of a number and four

A.A.3: EXPRESSIONS

221 Chad complained to his friend that he had five equations to solve for homework. Are all of the homework problems equations? Justify your answer.

Math Homework

1. $3x^2 \cdot 2x^4$
2. $5 - 2x = 3x$
3. $3(2x + 7)$
4. $7x^2 + 2x - 3x^2 - 9$
5. $\frac{2}{3} = \frac{x + 2}{6}$

Name ___Chad___

222 An example of an algebraic expression is
1 $\frac{2x + 3}{7} = \frac{13}{x}$
2 $(2x + 1)(x - 7)$
3 $4x - 1 = 4$
4 $x = 2$

223 An example of an algebraic expression is
1 $x + 2$
2 $y = x + 2$
3 $y < x + 2$
4 $y = x^2 + 2x$

224 An example of an algebraic expression is
1 $y = mx + b$
2 $3x + 4y - 7$
3 $2x + 3y \leq 18$
4 $(x + y)(x - y) = 25$

225 Mr. Stanton asked his students to write an algebraic expression on a piece of paper. He chose four students to go to the board and write their expression.

        Robert wrote: $4(2x + 5) \geq 17$

        Meredith wrote: $3y - 7 + 11z$

        Steven wrote: $9w + 2 = 20$

        Cynthia wrote: $8 + 10 - 4 = 14$

Which student wrote an algebraic expression?

1   Robert
2   Meredith
3   Steven
4   Cynthia

226 An example of an equation is

1    $2x^2 - 4x + 12$
2    $|x - 6|$
3    $4(x + 6)(x - 2)$
4    $2x = x^2 + 3$

A.A.22: SOLVING EQUATIONS

227 Solve for g: $3 + 2g = 5g - 9$

228 Which value of p is the solution of $5p - 1 = 2p + 20$?

1    $\dfrac{19}{7}$
2    $\dfrac{19}{3}$
3   3
4   7

229 Debbie solved the linear equation $3(x + 4) - 2 = 16$ as follows:

[Line 1] $3(x + 4) - 2 = 16$

[Line 2] $3(x + 4) = 18$

[Line 3] $3x + 4 = 18$

[Line 4] $3x = 14$

[Line 5] $x = 4\dfrac{2}{3}$

She made an error between lines

1   1 and 2
2   2 and 3
3   3 and 4
4   4 and 5

230 What is the value of x in the equation $2(x - 4) = 4(2x + 1)$?

1   -2
2   2
3    $-\dfrac{1}{2}$
4    $\dfrac{1}{2}$

231 Solve algebraically for x:
$3(x + 1) - 5x = 12 - (6x - 7)$

232 The solution of the equation $5 - 2x = -4x - 7$ is

1   1
2   2
3   -2
4   -6

A.A.25: SOLVING EQUATIONS WITH FRACTIONAL EXPRESSIONS

233 Which value of x is the solution of
$\frac{2x}{5} + \frac{1}{3} = \frac{7x-2}{15}$?

1 $\frac{3}{5}$

2 $\frac{31}{26}$

3 3

4 7

234 Which value of x is the solution of the equation
$\frac{2x}{3} + \frac{x}{6} = 5$?

1 6

2 10

3 15

4 30

235 Solve for x: $\frac{3}{5}(x+2) = x - 4$

1 8

2 13

3 15

4 23

236 Which value of x is the solution of $\frac{x}{3} + \frac{x+1}{2} = x$?

1 1

2 −1

3 3

4 −3

237 Which value of x is the solution of the equation
$\frac{2}{3}x + \frac{1}{2} = \frac{5}{6}$?

1 $\frac{1}{2}$

2 2

3 $\frac{2}{3}$

4 $\frac{3}{2}$

238 Solve for m: $\frac{m}{5} + \frac{3(m-1)}{2} = 2(m-3)$

239 Which value of x is the solution of the equation
$\frac{1}{7} + \frac{2x}{3} = \frac{15x-3}{21}$?

1 6

2 0

3 $\frac{4}{13}$

4 $\frac{6}{29}$

A.A.25: SOLVING EQUATIONS WITH DECIMALS

240 The value of y in the equation
$0.06y + 200 = 0.03y + 350$ is

1 500

2 $1,666.\overline{6}$

3 5,000

4 $18,333.\overline{3}$

A.A.4: MODELING EQUATIONS

241 If h represents a number, which equation is a correct translation of "Sixty more than 9 times a number is 375"?

1 $9h = 375$

2 $9h + 60 = 375$

3 $9h - 60 = 375$

4 $60h + 9 = 375$

242 The width of a rectangle is 4 less than half the length. If ℓ represents the length, which equation could be used to find the width, w?

1 $w = \frac{1}{2}(4 - \ell)$

2 $w = \frac{1}{2}(\ell - 4)$

3 $w = \frac{1}{2}\ell - 4$

4 $w = 4 - \frac{1}{2}\ell$

A.A.5: MODELING EQUATIONS

243 The length of a rectangular window is 5 feet more than its width, w. The area of the window is 36 square feet. Which equation could be used to find the dimensions of the window?

1 $w^2 + 5w + 36 = 0$

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

3 $w^2 - 5w + 36 = 0$

4 $w^2 + 5w - 36 = 0$

244 Rhonda has $1.35 in nickels and dimes in her pocket. If she has six more dimes than nickels, which equation can be used to determine x, the number of nickels she has?

1 $0.05(x + 6) + 0.10x = 1.35$

2 $0.05x + 0.10(x + 6) = 1.35$

3 $0.05 + 0.10(6x) = 1.35$

4 $0.15(x + 6) = 1.35$

245 The width of a rectangle is 3 less than twice the length, x. If the area of the rectangle is 43 square feet, which equation can be used to find the length, in feet?

1 $2x(x - 3) = 43$

2 $x(3 - 2x) = 43$

3 $2x + 2(2x - 3) = 43$

4 $x(2x - 3) = 43$

246 If n is an odd integer, which equation can be used to find three consecutive odd integers whose sum is -3?

1 $n + (n + 1) + (n + 3) = -3$

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

3 $n + (n + 2) + (n + 4) = -3$

4 $n + (n + 2) + (n + 3) = -3$

A.A.6: MODELING EQUATIONS

247 The ages of three brothers are consecutive even integers. Three times the age of the youngest brother exceeds the oldest brother's age by 48 years. What is the age of the youngest brother?

1 14

2 18

3 22

4 26

248 The sum of three consecutive odd integers is 18 less than five times the middle number. Find the three integers. [Only an algebraic solution can receive full credit.]

A.A.6: VENN DIAGRAMS

249 Monique has three sons who play football, two sons who play baseball, and one son who plays both sports. If all of her sons play baseball or football, how many sons does she have?

1 5

2 6

3 3

4 4

A.A.23: TRANSFORMING FORMULAS

250 If $3ax + b = c$, then x equals

1 $c - b + 3a$

2 $c + b - 3a$

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

4 $\dfrac{b - c}{3a}$

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

251 If the formula for the perimeter of a rectangle is $P = 2l + 2w$, then w can be expressed as

1 $w = \dfrac{2l - P}{2}$

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

3 $w = \dfrac{P - l}{2}$

4 $w = \dfrac{P - 2w}{2l}$

252 If $a + ar = b + r$, the value of a in terms of b and r can be expressed as

1 $\dfrac{b}{r} + 1$

2 $\dfrac{1 + b}{r}$

3 $\dfrac{b + r}{1 + r}$

4 $\dfrac{1 + b}{r + b}$

253 The members of the senior class are planning a dance. They use the equation $r = pn$ to determine the total receipts. What is n expressed in terms of r and p ?

1 $n = r + p$

2 $n = r - p$

3 $n = \dfrac{p}{r}$

4 $n = \dfrac{r}{p}$

254 A formula used for calculating velocity is $v = \dfrac{1}{2} at^2$. What is a expressed in terms of v and t?

1 $a = \dfrac{2v}{t}$

2 $a = \dfrac{2v}{t^2}$

3 $a = \dfrac{v}{t}$

4 $a = \dfrac{v}{2t^2}$

255 If $\dfrac{ey}{n} + k = t$, what is y in terms of e, n, k, and t?

1 $y = \dfrac{tn + k}{e}$

2 $y = \dfrac{tn - k}{e}$

3 $y = \dfrac{n(t + k)}{e}$

4 $y = \dfrac{n(t - k)}{e}$

256 Solve for c in terms of a and b: $bc + ac = ab$

257 If $s = \dfrac{2x + t}{r}$, then x equals

1 $\dfrac{rs - t}{2}$

2 $\dfrac{rs + 1}{2}$

3 $2rs - t$

4 $rs - 2t$

258 If $k = am + 3mx$, the value of m in terms of a, k, and x can be expressed as

1 $\dfrac{k}{a + 3x}$

2 $\dfrac{k - 3mx}{a}$

3 $\dfrac{k - am}{3x}$

4 $\dfrac{k - a}{3x}$

259 The formula for the volume of a pyramid is $V = \dfrac{1}{3} Bh$. What is h expressed in terms of B and V?

1 $h = \dfrac{1}{3} VB$

2 $h = \dfrac{V}{3B}$

3 $h = \dfrac{3V}{B}$

4 $h = 3VB$

260 If $rx - st = r$, which expression represents x?

1 $\dfrac{r + st}{r}$

2 $\dfrac{r}{r + st}$

3 $\dfrac{r}{r - st}$

4 $\dfrac{r - st}{r}$

261 If $2y + 2w = x$, then w, in terms of x and y, is equal to

1 $x - y$

2 $\dfrac{x - 2y}{2}$

3 $x + y$

4 $\dfrac{x + 2y}{2}$

262 If $abx - 5 = 0$, what is x in terms of a and b?

1 $x = \dfrac{5}{ab}$

2 $x = -\dfrac{5}{ab}$

3 $x = 5 - ab$

4 $x = ab - 5$

RATE
A.M.1: USING RATE

263 Tom drove 290 miles from his college to home and used 23.2 gallons of gasoline. His sister, Ann, drove 225 miles from her college to home and used 15 gallons of gasoline. Whose vehicle had better gas mileage? Justify your answer.

264 Nicole's aerobics class exercises to fast-paced music. If the rate of the music is 120 beats per minute, how many beats would there be in a class that is 0.75 hour long?

1 90

2 160

3 5,400

4 7,200

265 Joseph typed a 1,200-word essay in 25 minutes. At this rate, determine how many words he can type in 45 minutes.

266 A cell phone can receive 120 messages per minute. At this rate, how many messages can the phone receive in 150 seconds?

1 48

2 75

3 300

4 18,000

267 A car uses one gallon of gasoline for every 20 miles it travels. If a gallon of gasoline costs $3.98, how much will the gas cost, to the *nearest dollar*, to travel 180 miles?
1   9
2   36
3   45
4   80

A.M.1: SPEED

268 Hannah took a trip to visit her cousin. She drove 120 miles to reach her cousin's house and the same distance back home. It took her 1.2 hours to get halfway to her cousin's house. What was her average speed, in miles per hour, for the first 1.2 hours of the trip? Hannah's average speed for the remainder of the trip to her cousin's house was 40 miles per hour. How long, in hours, did it take her to drive the remaining distance? Traveling home along the same route, Hannah drove at an average rate of 55 miles per hour. After 2 hours her car broke down. How many miles was she from home?

269 In a game of ice hockey, the hockey puck took 0.8 second to travel 89 feet to the goal line. Determine the average speed of the puck in feet per second.

270 What is the speed, in meters per second, of a paper airplane that flies 24 meters in 6 seconds?
1   144
2   30
3   18
4   4

271 It takes Tammy 45 minutes to ride her bike 5 miles. At this rate, how long will it take her to ride 8 miles?
1   0.89 hour
2   1.125 hours
3   48 minutes
4   72 minutes

272 The chart below compares two runners.

Runner	Distance, in miles	Time, in hours
Greg	11	2
Dave	16	3

Based on the information in this chart, state which runner has the faster rate. Justify your answer.

273 Steve ran a distance of 150 meters in $1\frac{1}{2}$ minutes. What is his speed in meters per hour?
1   6
2   60
3   100
4   6,000

274 A hiker walked 12.8 miles from 9:00 a.m. to noon. He walked an additional 17.2 miles from 1:00 p.m. to 6:00 p.m. What is his average rate for the entire walk, in miles per hour?
1   3.75
2   3.86
3   4.27
4   7.71

275 A turtle and a rabbit are in a race to see who is first to reach a point 100 feet away. The turtle travels at a constant speed of 20 feet per minute for the entire 100 feet. The rabbit travels at a constant speed of 40 feet per minute for the first 50 feet, stops for 3 minutes, and then continues at a constant speed of 40 feet per minute for the last 50 feet. Determine which animal won the race and by how much time.

276 In a baseball game, the ball traveled 350.7 feet in 4.2 seconds. What was the average speed of the ball, in feet per second?
1   83.5
2   177.5
3   354.9
4   1,472.9

277 The distance from Earth to Mars is 136,000,000 miles. A spaceship travels at 31,000 miles per hour. Determine, to the *nearest day*, how long it will take the spaceship to reach Mars.

278 Jonathan drove to the airport to pick up his friend. A rainstorm forced him to drive at an average speed of 45 mph, reaching the airport in 3 hours. He drove back home at an average speed of 55 mph. How long, to the nearest tenth of an hour, did the trip home take him?
1   2.0 hours
2   2.5 hours
3   2.8 hours
4   3.7 hours

A.M.2: CONVERSIONS

279 On a certain day in Toronto, Canada, the temperature was 15° Celsius (C). Using the formula $F = \frac{9}{5}C + 32$, Peter converts this temperature to degrees Fahrenheit (F). Which temperature represents 15°C in degrees Fahrenheit?
1   −9
2   35
3   59
4   85

280 If the speed of sound is 344 meters per second, what is the approximate speed of sound, in meters per hour?

60 seconds = 1 minute
60 minutes = 1 hour

1   20,640
2   41,280
3   123,840
4   1,238,400

281 Angela wants to purchase carpeting for her living room. The dimensions of her living room are 12 feet by 12 feet. If carpeting is sold by the square yard, determine how many square yards of carpeting she must purchase.

3 feet = 1 yard
9 square feet = 1 square yard

282 Roberta needs ribbon for a craft project. The ribbon sells for $3.75 per yard. Find the cost, in dollars, for 48 inches of the ribbon.

283 Mrs. Chen owns two pieces of property. The areas of the properties are 77,120 square feet and 33,500 square feet.

43,560 square feet = 1 acre

Find the total number of acres Mrs. Chen owns, to the *nearest hundredth of an acre*.

284 Elizabeth is baking chocolate chip cookies. A single batch uses $\frac{3}{4}$ teaspoon of vanilla. If Elizabeth is mixing the ingredients for five batches at the same time, how many tablespoons of vanilla will she use?

3 teaspoons = 1 tablespoon

1    $1\frac{1}{4}$
2    $1\frac{3}{4}$
3    $3\frac{3}{4}$
4    $5\frac{3}{4}$

285 Peter walked 8,900 feet from home to school.

$$1 \text{ mile} = 5,280 \text{ feet}$$

How far, to the *nearest tenth of a mile*, did he walk?
1   0.5
2   0.6
3   1.6
4   1.7

286 Which expression can be used to change 75 kilometers per hour to meters per minute?
1   $\dfrac{75 \text{ km}}{1 \text{ hr}} \times \dfrac{1 \text{ km}}{1,000 \text{ m}} \times \dfrac{1 \text{ hr}}{60 \text{ min}}$
2   $\dfrac{75 \text{ km}}{1 \text{ hr}} \times \dfrac{1 \text{ km}}{1,000 \text{ m}} \times \dfrac{60 \text{ min}}{1 \text{ hr}}$
3   $\dfrac{75 \text{ km}}{1 \text{ hr}} \times \dfrac{1,000 \text{ m}}{1 \text{ km}} \times \dfrac{1 \text{ hr}}{60 \text{ min}}$
4   $\dfrac{75 \text{ km}}{1 \text{ hr}} \times \dfrac{1,000 \text{ m}}{1 \text{ km}} \times \dfrac{60 \text{ min}}{1 \text{ hr}}$

287 A soda container holds $5\frac{1}{2}$ gallons of soda. How many ounces of soda does this container hold?

$$1 \text{ quart} = 32 \text{ ounces}$$
$$1 \text{ gallon} = 4 \text{ quarts}$$

1   44
2   176
3   640
4   704

288 A jogger ran at a rate of 5.4 miles per hour. Find the jogger's *exact* rate, in feet per minute.

$$1 \text{ mile} = 5,280 \text{ feet}$$

289 The Hudson Record Store is having a going-out-of-business sale. CDs normally sell for $18.00. During the first week of the sale, all CDs will sell for $15.00. Written as a fraction, what is the rate of discount? What is this rate expressed as a percent? Round your answer to the *nearest hundredth of a percent*. During the second week of the sale, the same CDs will be on sale for 25% off the *original* price. What is the price of a CD during the second week of the sale?

290 At the end of week one, a stock had increased in value from $5.75 a share to $7.50 a share. Find the percent of increase at the end of week one to the *nearest tenth of a percent*. At the end of week two, the same stock had decreased in value from $7.50 to $5.75. Is the percent of decrease at the end of week two the same as the percent of increase at the end of week one? Justify your answer.

291 In a recent town election, 1,860 people voted for either candidate *A* or candidate *B* for the position of supervisor. If candidate *A* received 55% of the votes, how many votes did candidate *B* receive?
1   186
2   837
3   1,023
4   1,805

292 Shana wants to buy a new bicycle that has a retail price of $259.99. She knows that it will be on sale next week for 30% off the retail price. If the tax rate is 7%, find the total amount, to the *nearest cent*, that she will save by waiting until next week.

293 Miller's Department Store is having a sale with a 25% discount on mattresses. If the sales tax rate is 8%, how much change will Frank receive from $800 if he purchases a mattress regularly priced at $895 during this sale?

A.N.5: DIRECT VARIATION

294 The table below represents the number of hours a student worked and the amount of money the student earned.

Number of Hours (h)	Dollars Earned (d)
8	$50.00
15	$93.75
19	$118.75
30	$187.50

Write an equation that represents the number of dollars, d, earned in terms of the number of hours, h, worked. Using this equation, determine the number of dollars the student would earn for working 40 hours.

295 The number of calories burned while jogging varies directly with the number of minutes spent jogging. If George burns 150 calories by jogging for 20 minutes, how many calories does he burn by jogging for 30 minutes?
1   100
2   180
3   200
4   225

LINEAR EQUATIONS
A.A.32: SLOPE

296 In a linear equation, the independent variable increases at a constant rate while the dependent variable decreases at a constant rate. The slope of this line is
1   zero
2   negative
3   positive
4   undefined

297 The data in the table below are graphed, and the slope is examined.

x	y
0.5	9.0
1	8.75
1.5	8.5
2	8.25
2.5	8.0

The rate of change represented in this table can be described as
1   negative
2   positive
3   undefined
4   zero

298 In a given linear equation, the value of the independent variable decreases at a constant rate while the value of the dependent variable increases at a constant rate. The slope of this line is
1   positive
2   negative
3   zero
4   undefined

A.A.33: SLOPE

299 What is the slope of the line containing the points $(3, 4)$ and $(-6, 10)$?
1    $\frac{1}{2}$
2   2
3    $-\frac{2}{3}$
4    $-\frac{3}{2}$

300 What is the slope of the line that passes through the points $(-6, 1)$ and $(4, -4)$?
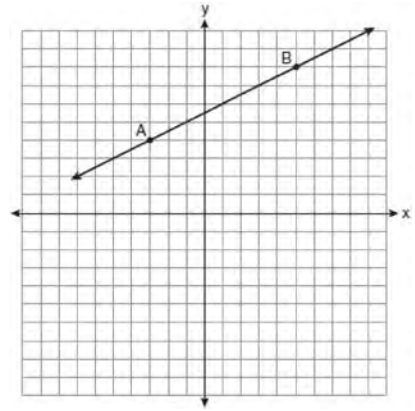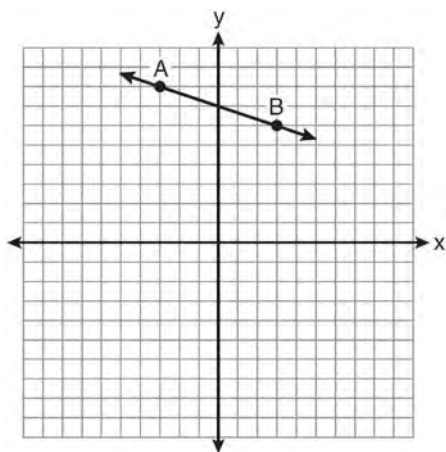
1 -2

2 2

3 $-\dfrac{1}{2}$

4 $\dfrac{1}{2}$

301 What is the slope of the line that passes through the points $(2, 5)$ and $(7, 3)$?

1 $-\dfrac{5}{2}$

2 $-\dfrac{2}{5}$

3 $\dfrac{8}{9}$

4 $\dfrac{9}{8}$

302 What is the slope of the line that passes through the points $(-5, 4)$ and $(15, -4)$?

1 $-\dfrac{2}{5}$

2 0

3 $-\dfrac{5}{2}$

4 undefined

303 In the diagram below, what is the slope of the line passing through points A and B?

1 -2

2 2

3 $-\dfrac{1}{2}$

4 $\dfrac{1}{2}$

304 What is the slope of the line that passes through the points $(3, 5)$ and $(-2, 2)$?

1 $\dfrac{1}{5}$

2 $\dfrac{3}{5}$

3 $\dfrac{5}{3}$

4 5

305 What is the slope of the line passing through the points *A* and *B,* as shown on the graph below?

1   −3

2    $-\dfrac{1}{3}$

3   3

4    $\dfrac{1}{3}$

306 What is the slope of the line passing through the points $(-2, 4)$ and $(3, 6)$?

1    $-\dfrac{5}{2}$

2    $-\dfrac{2}{5}$

3    $\dfrac{2}{5}$

4    $\dfrac{5}{2}$

307 What is the slope of the line that passes through the points $(2, -3)$ and $(5, 1)$?

1    $-\dfrac{2}{3}$

2    $\dfrac{2}{3}$

3    $-\dfrac{4}{3}$

4    $\dfrac{4}{3}$

308 What is the slope of the line that passes through the points $(4, -7)$ and $(9, 1)$?

1    $\dfrac{5}{8}$

2    $\dfrac{8}{5}$

3    $-\dfrac{6}{12}$

4    $-\dfrac{13}{6}$

A.A.37: SLOPE

309 What is the slope of the line whose equation is $3x - 7y = 9$?

1    $-\dfrac{3}{7}$

2    $\dfrac{3}{7}$

3    $-\dfrac{7}{3}$

4    $\dfrac{7}{3}$

310 The line represented by the equation $2y - 3x = 4$ has a slope of

1    $-\dfrac{3}{2}$

2   2

3   3

4    $\dfrac{3}{2}$

311 What is the slope of the line represented by the equation $4x + 3y = 12$?

1    $\dfrac{4}{3}$

2    $\dfrac{3}{4}$

3    $-\dfrac{3}{4}$

4    $-\dfrac{4}{3}$

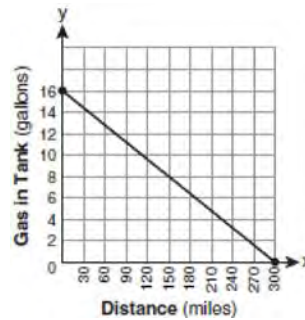312 What is the slope of a line represented by the equation $2y = x - 4$?

1 1

2 $\frac{1}{2}$

3 −1

4 $-\frac{1}{2}$
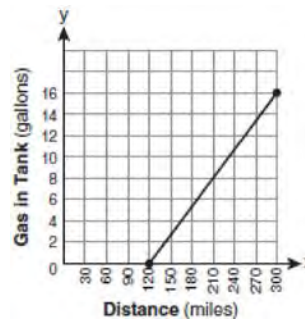
A.G.4: GRAPHING LINEAR FUNCTIONS

313 The gas tank in a car holds a total of 16 gallons of gas. The car travels 75 miles on 4 gallons of gas. If the gas tank is full at the beginning of a trip, which graph represents the rate of change in the amount of gas in the tank?
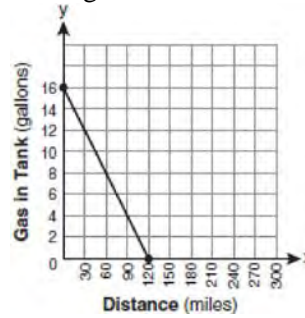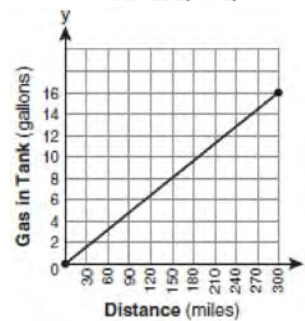
1

2

3

4

A.A.34: WRITING LINEAR EQUATIONS

314 What is an equation of the line that passes through the point $(4, -6)$ and has a slope of -3?
1 $y = -3x + 6$
2 $y = -3x - 6$
3 $y = -3x + 10$
4 $y = -3x + 14$

315 What is an equation of the line that passes through the point $(3, -1)$ and has a slope of 2?
1 $y = 2x + 5$
2 $y = 2x - 1$
3 $y = 2x - 4$
4 $y = 2x - 7$

316 A line having a slope of $\frac{3}{4}$ passes through the point $(-8, 4)$. Write the equation of this line in slope-intercept form.

317 Which equation represents the line that passes through the point $(1, 5)$ and has a slope of -2?
1 $y = -2x + 7$
2 $y = -2x + 11$
3 $y = 2x - 9$
4 $y = 2x + 3$

318 Which equation represents a line that has a slope of $\frac{3}{4}$ and passes through the point $(2, 1)$?
1 $3y = 4x - 5$
2 $3y = 4x + 2$
3 $4y = 3x - 2$
4 $4y = 3x + 5$

319 What is an equation of the line that passes through the point $(-2, -8)$ and has a slope of 3?
1 $y = 3x - 2$
2 $y = 3x - 22$
3 $y = 3x + 2$
4 $y = 3x + 22$

A.A.35: WRITING LINEAR EQUATIONS

320 What is an equation for the line that passes through the coordinates $(2, 0)$ and $(0, 3)$?
1 $y = -\frac{3}{2}x + 3$
2 $y = -\frac{3}{2}x - 3$
3 $y = -\frac{2}{3}x + 2$
4 $y = -\frac{2}{3}x - 2$

321 Write an equation that represents the line that passes through the points $(5, 4)$ and $(-5, 0)$.

322 What is an equation of the line that passes through the points $(3, -3)$ and $(-3, -3)$?
1 $y = 3$
2 $x = -3$
3 $y = -3$
4 $x = y$

323 Which equation represents the line that passes through the points $(-3, 7)$ and $(3, 3)$?
1 $y = \frac{2}{3}x + 1$
2 $y = \frac{2}{3}x + 9$
3 $y = -\frac{2}{3}x + 5$
4 $y = -\frac{2}{3}x + 9$

324 What is an equation of the line that passes through the points $(1, 3)$ and $(8, 5)$?
1 $y + 1 = \frac{2}{7}(x + 3)$
2 $y - 5 = \frac{2}{7}(x - 8)$
3 $y - 1 = \frac{2}{7}(x + 3)$
4 $y + 5 = \frac{2}{7}(x - 8)$

A.A.39: IDENTIFYING POINTS ON A LINE

325 Which point is on the line $4y - 2x = 0$?
1 $(-2, -1)$
2 $(-2, 1)$
3 $(-1, -2)$
4 $(1, 2)$

326 Which linear equation represents a line containing the point $(1, 3)$?
1 $x + 2y = 5$
2 $x - 2y = 5$
3 $2x + y = 5$
4 $2x - y = 5$

327 Which point lies on the line whose equation is $2x - 3y = 9$?
1 $(-1, -3)$
2 $(-1, 3)$
3 $(0, 3)$
4 $(0, -3)$

328 Which point lies on the graph represented by the equation $3y + 2x = 8$?
1 $(-2, 7)$
2 $(0, 4)$
3 $(2, 4)$
4 $(7, -2)$

329 Which set of coordinates is a solution of the equation $2x - y = 11$?
1 $(-6, 1)$
2 $(-1, 9)$
3 $(0, 11)$
4 $(2, -7)$

330 If the point $(5, k)$ lies on the line represented by the equation $2x + y = 9$, the value of k is
1 1
2 2
3 -1
4 -2

A.A.36: PARALLEL AND PERPENDICULAR LINES

331 Which equation represents a line parallel to the x-axis?
1 $x = 5$
2 $y = 10$
3 $x = \frac{1}{3}y$
4 $y = 5x + 17$

332 Which equation represents a line parallel to the x-axis?
1 $y = -5$
2 $y = -5x$
3 $x = 3$
4 $x = 3y$

333 Which equation represents a line parallel to the y-axis?
1 $x = y$
2 $x = 4$
3 $y = 4$
4 $y = x + 4$

334 Which equation represents a line parallel to the y-axis?
1 $y = x$
2 $y = 3$
3 $x = -y$
4 $x = -4$

335 Which equation represents the line that passes through the point $(3, 4)$ and is parallel to the x-axis?
1 $x = 4$
2 $x = -3$
3 $y = 4$
4 $y = -3$

336 Which equation represents a line that is parallel to the y-axis and passes through the point $(4, 3)$?
1   $x = 3$
2   $x = 4$
3   $y = 3$
4   $y = 4$

A.A.38: PARALLEL AND PERPENDICULAR LINES

337 Which equation represents a line that is parallel to the line $y = -4x + 5$?
1   $y = -4x + 3$
2   $y = -\frac{1}{4}x + 5$
3   $y = \frac{1}{4}x + 3$
4   $y = 4x + 5$

338 Which equation represents a line that is parallel to the line $y = 3 - 2x$?
1   $4x + 2y = 5$
2   $2x + 4y = 1$
3   $y = 3 - 4x$
4   $y = 4x - 2$

339 Which equation represents a line parallel to the graph of $2x - 4y = 16$?
1   $y = \frac{1}{2}x - 5$
2   $y = -\frac{1}{2}x + 4$
3   $y = -2x + 6$
4   $y = 2x + 8$

340 The graphs of the equations $y = 2x - 7$ and $y - kx = 7$ are parallel when k equals
1   -2
2   2
3   -7
4   7

341 Which equation represents a line that is parallel to the line whose equation is $2x - 3y = 9$?
1   $y = \frac{2}{3}x - 4$
2   $y = -\frac{2}{3}x + 4$
3   $y = \frac{3}{2}x - 4$
4   $y = -\frac{3}{2}x + 4$

342 Which equation represents a line that is parallel to the line whose equation is $y = -3x - 7$?
1   $y = -3x + 4$
2   $y = -\frac{1}{3}x - 7$
3   $y = \frac{1}{3}x + 5$
4   $y = 3x - 2$

INEQUALITIES
A.A.24: SOLVING INEQUALITIES

343 What is the solution of $3(2m - 1) \leq 4m + 7$?
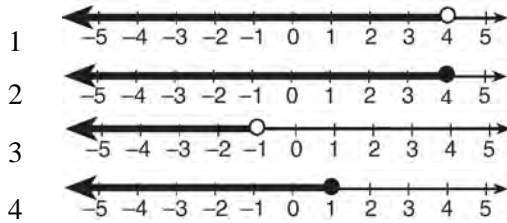1 $m \leq 5$
2   $m \geq 5$
3   $m \leq 4$
4   $m \geq 4$

344 What is the solution of the inequality $-6x - 17 \geq 8x + 25$?
1   $x \geq 3$
2   $x \leq 3$
3   $x \geq -3$
4   $x \leq -3$

345 Solve algebraically for x: $2(x - 4) \geq \frac{1}{2}(5 - 3x)$

346 Solve the inequality $-5(x - 7) < 15$ algebraically for x.

347 Which graph represents the solution set of
$2x - 5 < 3$?

1

2

3

4

A.A.21: INTERPRETING SOLUTIONS

348 Which value of x is in the solution set of the
inequality $-2x + 5 > 17$?
1 -8
2 -6
3 -4
4 12

349 Which value of x is in the solution set of the
inequality $-4x + 2 > 10$?
1 -2
2 2
3 3
4 -4

350 Which value of x is in the solution set of
$\frac{4}{3}x + 5 < 17$?
1 8
2 9
3 12
4 16

351 Which value of x is in the solution set of the
inequality $-2(x - 5) < 4$?
1 0
2 2
3 3
4 5

352 Given: $A = \{18, 6, -3, -12\}$
Determine all elements of set A that are in the
solution of the inequality $\frac{2}{3}x + 3 < -2x - 7$.

353 Which value of x is in the solution set of
$-3x + 8 \geq 14$?
1 -3
2 -1
3 0
4 3

354 The statement $|-15| < x < |-20|$ is true when x is
equal to
1 -16
2 -14
3 17
4 21

A.A.4: MODELING INEQUALITIES

355 Mrs. Smith wrote "Eight less than three times a
number is greater than fifteen" on the board. If x
represents the number, which inequality is a correct
translation of this statement?
1 $3x - 8 > 15$
2 $3x - 8 < 15$
3 $8 - 3x > 15$
4 $8 - 3x < 15$

356 The sign shown below is posted in front of a roller
coaster ride at the Wadsworth County Fairgrounds.

All riders **MUST** be
at least 48 inches tall.
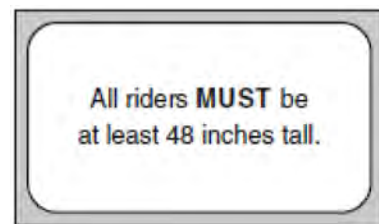
If h represents the height of a rider in inches, what
is a correct translation of the statement on this
sign?
1 $h < 48$
2 $h > 48$
3 $h \leq 48$
4 $h \geq 48$

A.A.5: MODELING INEQUALITIES

357 An electronics store sells DVD players and cordless telephones. The store makes a $75 profit on the sale of each DVD player (d) and a $30 profit on the sale of each cordless telephone (c). The store wants to make a profit of at least $255.00 from its sales of DVD players and cordless phones. Which inequality describes this situation?
1 $75d + 30c < 255$
2 $75d + 30c \le 255$
3 $75d + 30c > 255$
4 $75d + 30c \ge 255$

358 Students in a ninth grade class measured their heights, h, in centimeters. The height of the shortest student was 155 cm, and the height of the tallest student was 190 cm. Which inequality represents the range of heights?
1 $155 < h < 190$
2 $155 \le h \le 190$
3 $h \ge 155$ or $h \le 190$
4 $h > 155$ or $h < 190$

359 Roger is having a picnic for 78 guests. He plans to serve each guest at least one hot dog. If each package, p, contains eight hot dogs, which inequality could be used to determine how many packages of hot dogs Roger will need to buy?
1 $p \ge 78$
2 $8p \ge 78$
3 $8 + p \ge 78$
4 $78 - p \ge 8$

360 The ninth grade class at a local high school needs to purchase a park permit for $250.00 for their upcoming class picnic. Each ninth grader attending the picnic pays $0.75. Each guest pays $1.25. If 200 ninth graders attend the picnic, which inequality can be used to determine the number of guests, x, needed to cover the cost of the permit?
1 $0.75x - (1.25)(200) \ge 250.00$
2 $0.75x + (1.25)(200) \ge 250.00$
3 $(0.75)(200) - 1.25x \ge 250.00$
4 $(0.75)(200) + 1.25x \ge 250.00$

361 The length of a rectangle is 15 and its width is w. The perimeter of the rectangle is, *at most*, 50. Which inequality can be used to find the longest possible width?
1 $30 + 2w < 50$
2 $30 + 2w \le 50$
3 $30 + 2w > 50$
4 $30 + 2w \ge 50$

362 Carol plans to sell twice as many magazine subscriptions as Jennifer. If Carol and Jennifer need to sell at least 90 subscriptions in all, which inequality could be used to determine how many subscriptions, x, Jennifer needs to sell?
1 $x \ge 45$
2 $2x \ge 90$
3 $2x - x \ge 90$
4 $2x + x \ge 90$

363 Jeremy is hosting a Halloween party for 80 children. He will give each child *at least* one candy bar. If each bag of candy contains 18 candy bars, which inequality can be used to determine how many bags, c, Jeremy will need to buy?
1 $18c \ge 80$
2 $18c \le 80$
3 $\dfrac{c}{18} \ge 80$
4 $\dfrac{c}{18} \le 80$

A.A.6: MODELING INEQUALITIES

364 A prom ticket at Smith High School is $120. Tom is going to save money for the ticket by walking his neighbor's dog for $15 per week. If Tom already has saved $22, what is the minimum number of weeks Tom must walk the dog to earn enough to pay for the prom ticket?

365 Peter begins his kindergarten year able to spell 10 words. He is going to learn to spell 2 new words every day. Write an inequality that can be used to determine how many days, *d*, it takes Peter to be able to spell *at least* 75 words. Use this inequality to determine the minimum number of whole days it will take for him to be able to spell *at least* 75 words.

366 Tamara has a cell phone plan that charges $0.07 per minute plus a monthly fee of $19.00. She budgets $29.50 per month for total cell phone expenses without taxes. What is the maximum number of minutes Tamara could use her phone each month in order to stay within her budget?
1   150
2   271
3   421
4   692

367 An online music club has a one-time registration fee of $13.95 and charges $0.49 to buy each song. If Emma has $50.00 to join the club and buy songs, what is the maximum number of songs she can buy?
1   73
2   74
3   130
4   131

368 Chelsea has $45 to spend at the fair. She spends $20 on admission and $15 on snacks. She wants to play a game that costs $0.65 per game. Write an inequality to find the maximum number of times, *x*, Chelsea can play the game. Using this inequality, determine the maximum number of times she can play the game.

369 If five times a number is less than 55, what is the greatest possible integer value of the number?
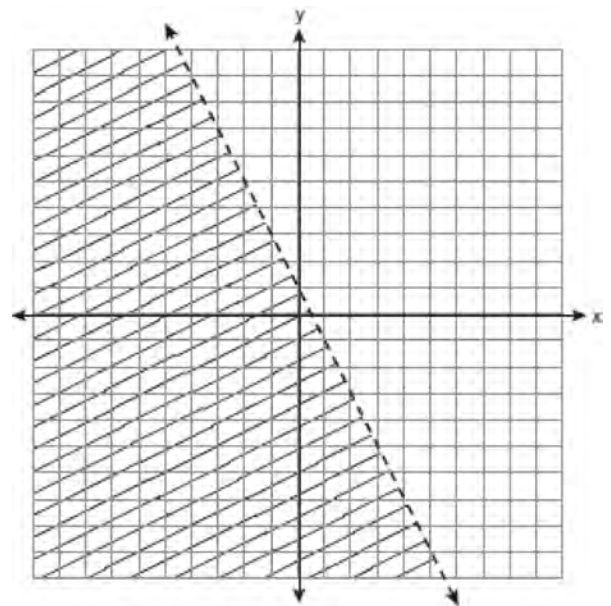1   12
2   11
3   10
4   9

370 Jason's part-time job pays him $155 a week. If he has already saved $375, what is the minimum number of weeks he needs to work in order to have enough money to buy a dirt bike for $900?
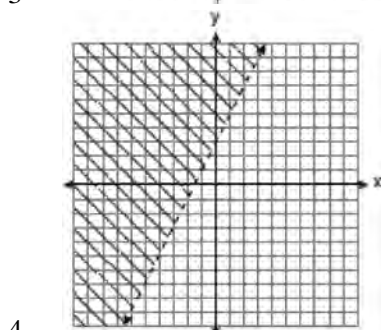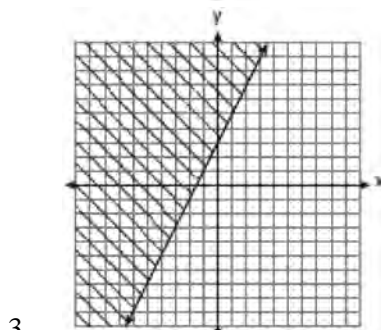1   8
2   9
3   3
4   4
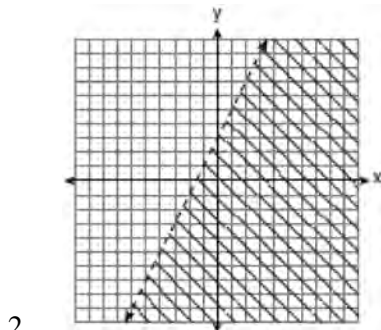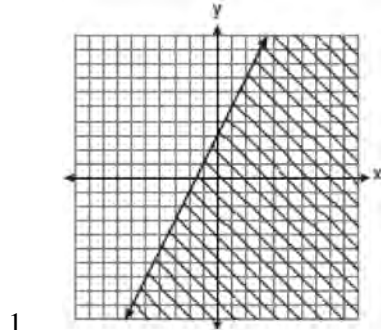
A.G.6: LINEAR INEQUALITIES

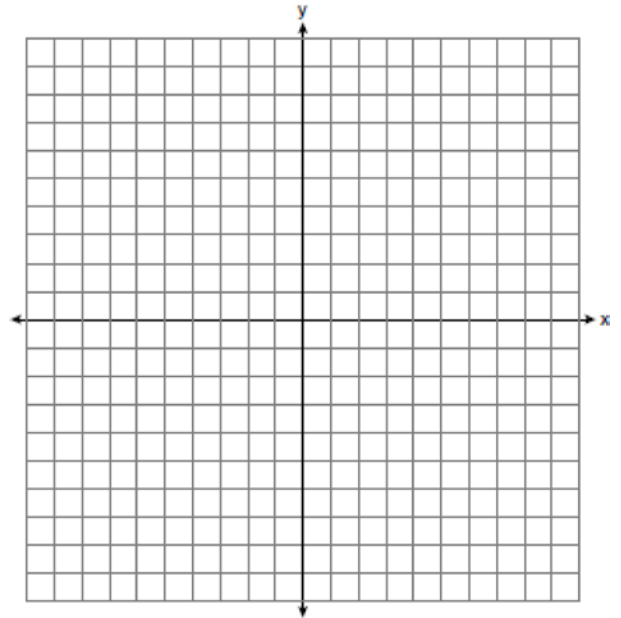371 Which inequality is represented by the graph below?

1    $y < 2x + 1$
2    $y < -2x + 1$
3    $y < \frac{1}{2}x + 1$
4    $y < -\frac{1}{2}x + 1$

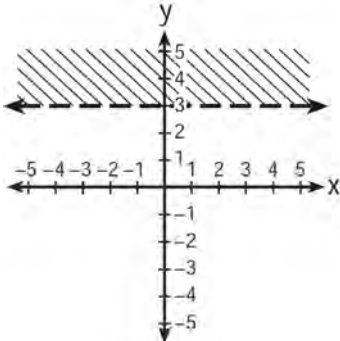372 Which graph represents the solution of $3y - 9 \le 6x$?

1

2

3

4

373 Graph the solution set for the inequality $4x - 3y > 9$ on the set of axes below. Determine if the point $(1, -3)$ is in the solution set. Justify your answer.
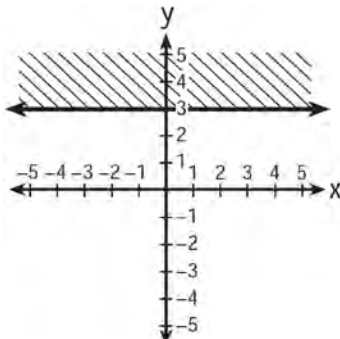
374 Which quadrant will be completely shaded in the graph of the inequality $y \le 2x$?
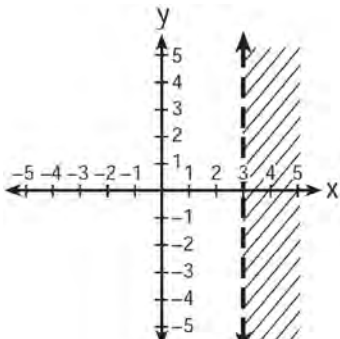
1   Quadrant I
2   Quadrant II
3   Quadrant III
4   Quadrant IV
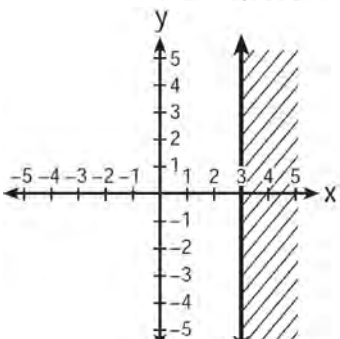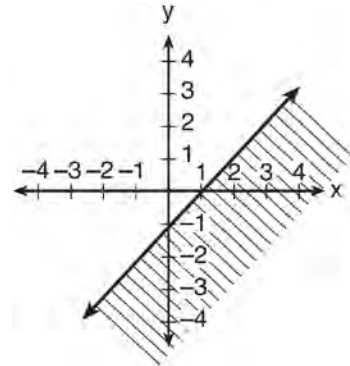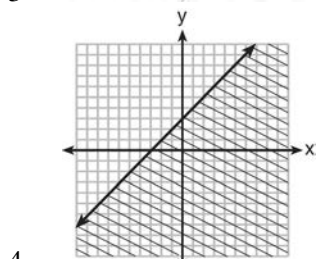
375 Which graph represents the inequality $y > 3$?

1

2
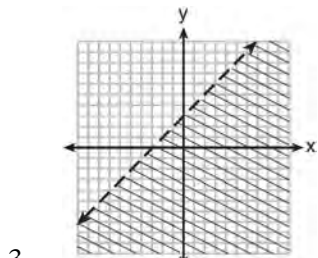
3

4

376 The diagram below shows the graph of which inequality?

1 $y > x - 1$
2 $y \geq x - 1$
3 $y < x - 1$
4 $y \leq x - 1$

61

377 Which graph represents the inequality $y \geq x + 3$?

1

2

3

4
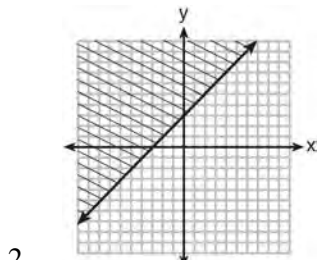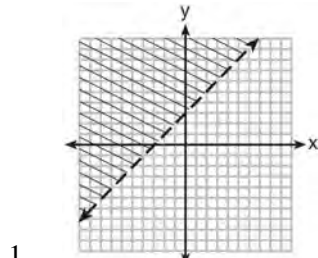
378 Which graph represents the solution of $2y + 6 > 4x$?

1

2

3

4
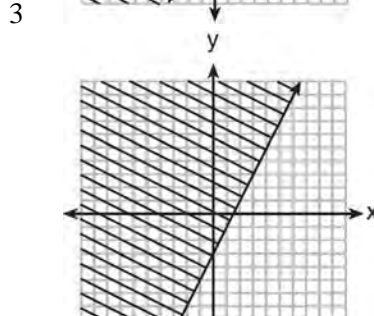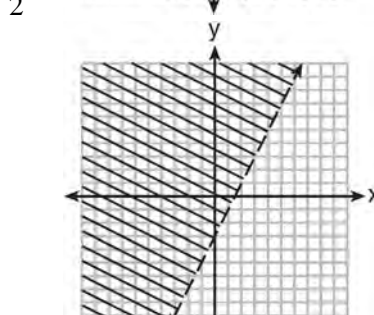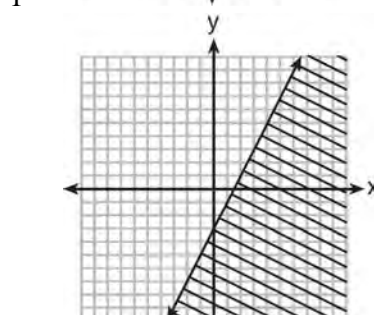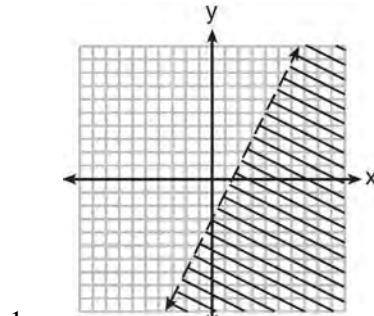
ABSOLUTE VALUE

A.G.4: GRAPHING ABSOLUTE VALUE FUNCTIONS

379 Which is the graph of $y = |x| + 2$?

1

2

3

4
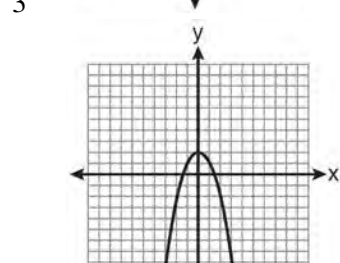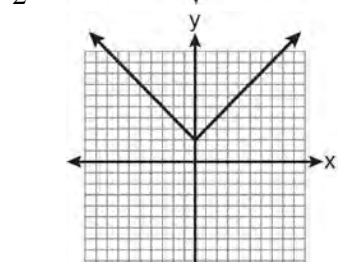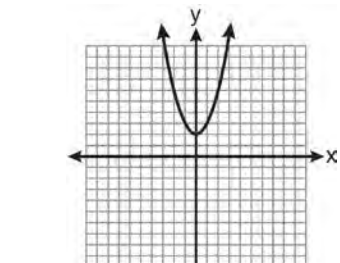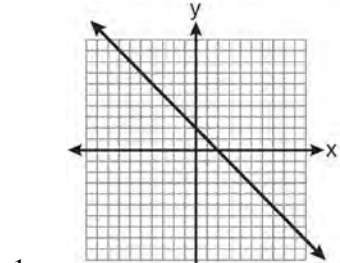
380 On the set of axes below, graph $y = 2|x + 3|$.
Include the interval $-7 \le x \le 1$.
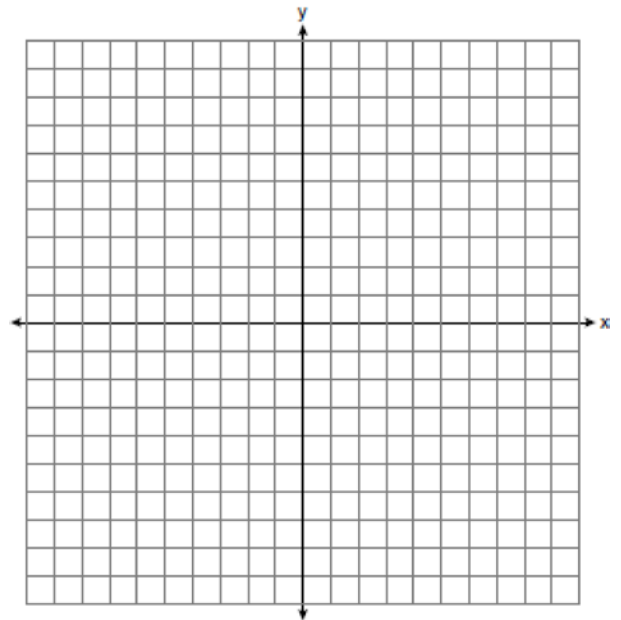
A.G.5: GRAPHING ABSOLUTE VALUE FUNCTIONS

381 The diagram below shows the graph of $y = |x - 3|$.

Which diagram shows the graph of $y = -|x - 3|$?

1

2

3

4
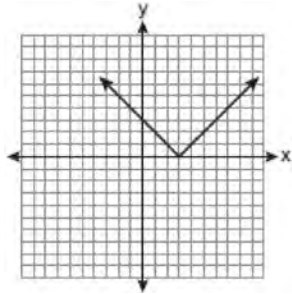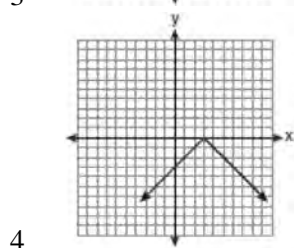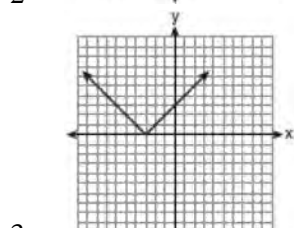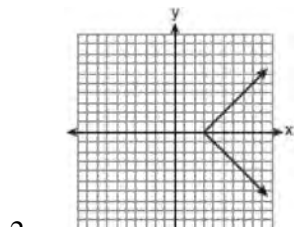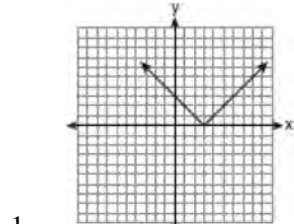
382 The graph of the equation $y = |x|$ is shown in the diagram below.
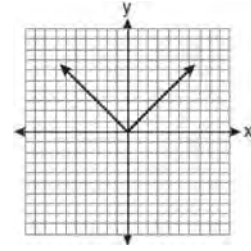
Which diagram could represent a graph of the equation $y = a|x|$ when $-1 < a < 0$?

1

2

3

4
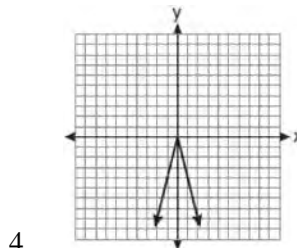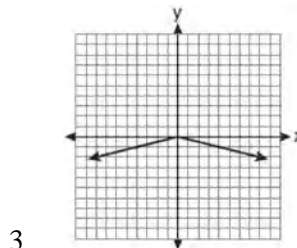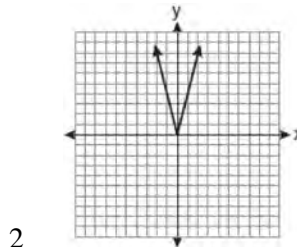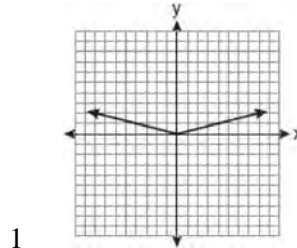
383 Graph and label the following equations on the set of axes below.

$$y = |x|$$

$$y = \left| \frac{1}{2} x \right|$$

Explain how *decreasing* the coefficient of x affects the graph of the equation $y = |x|$.
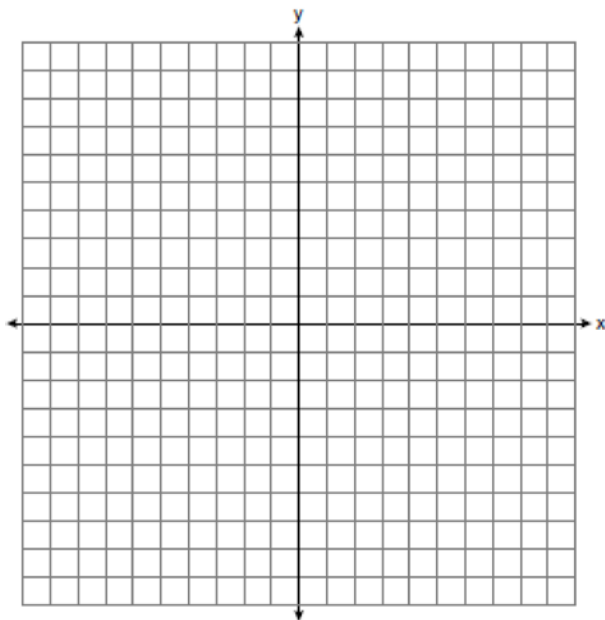
384 On the set of axes below, graph and label the equations $y = |x|$ and $y = 3|x|$ for the interval $-3 \le x \le 3$.
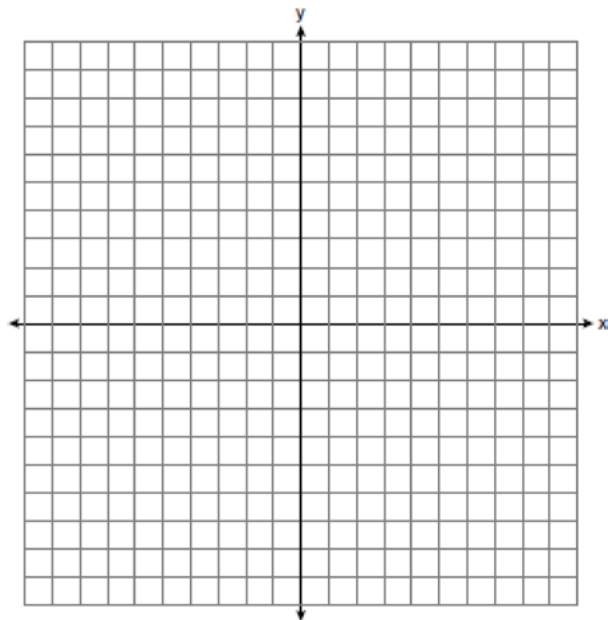
Explain how changing the coefficient of the absolute value from 1 to 3 affects the graph.

385 The graph of $y = |x + 2|$ is shown below.
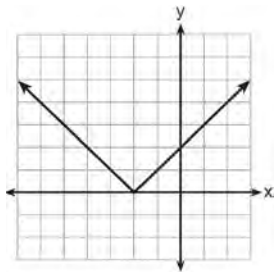
Which graph represents $y = -|x + 2|$?

1

2

3

4
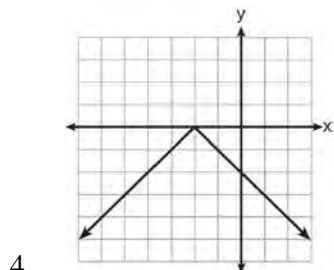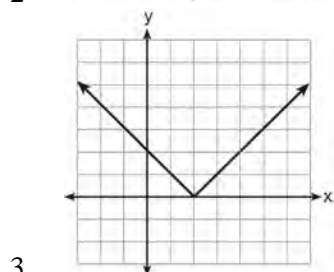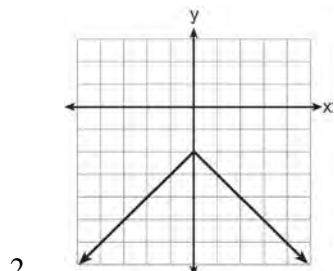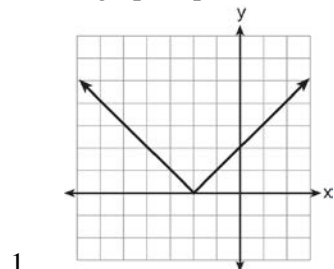
386 Graph and label the functions $y = |x|$ and $y = |2x|$ on the set of axes below.
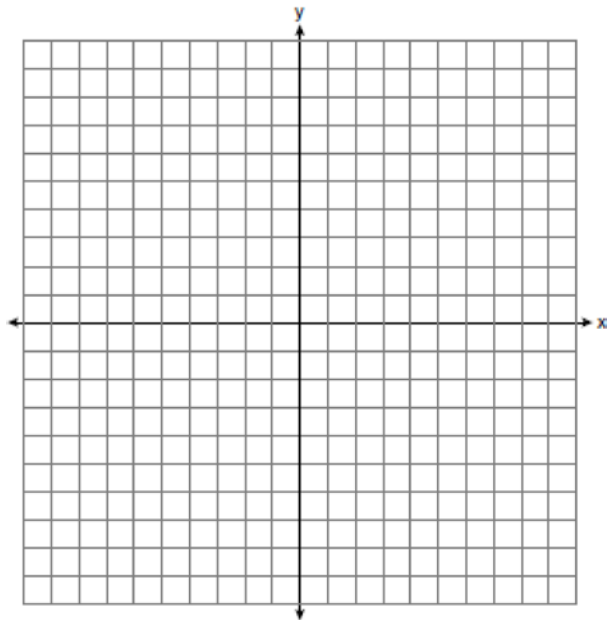
Explain how increasing the coefficient of x affects the graph of $y = |x|$.

QUADRATICS
A.A.20: FACTORING POLYNOMIALS

387 Factored completely, the expression $2x^2 + 10x - 12$ is equivalent to
   1 $2(x - 6)(x + 1)$
   2 $2(x + 6)(x - 1)$
   3 $2(x + 2)(x + 3)$
   4 $2(x - 2)(x - 3)$

388 Factored completely, the expression $3x^2 - 3x - 18$ is equivalent to
   1 $3(x^2 - x - 6)$
   2 $3(x - 3)(x + 2)$
   3 $(3x - 9)(x + 2)$
   4 $(3x + 6)(x - 3)$

389 What are the factors of the expression $x^2 + x - 20$?
1 $(x + 5)$ and $(x + 4)$
2 $(x + 5)$ and $(x - 4)$
3 $(x - 5)$ and $(x + 4)$
4 $(x - 5)$ and $(x - 4)$

390 Factored completely, the expression
$3x^3 - 33x^2 + 90x$ is equivalent to
1 $3x(x^2 - 33x + 90)$
2 $3x(x^2 - 11x + 30)$
3 $3x(x + 5)(x + 6)$
4 $3x(x - 5)(x - 6)$

391 Factor completely: $5x^3 - 20x^2 - 60x$

392 The greatest common factor of $3m^2n + 12mn^2$ is?
1 $3n$
2 $3m$
3 $3mn$
4 $3mn^2$

A.A.19: FACTORING THE DIFFERENCE OF PERFECT SQUARES

393 The expression $x^2 - 16$ is equivalent to
1 $(x + 2)(x - 8)$
2 $(x - 2)(x + 8)$
3 $(x + 4)(x - 4)$
4 $(x + 8)(x - 8)$

394 Factored, the expression $16x^2 - 25y^2$ is equivalent to
1 $(4x - 5y)(4x + 5y)$
2 $(4x - 5y)(4x - 5y)$
3 $(8x - 5y)(8x + 5y)$
4 $(8x - 5y)(8x - 5y)$

395 The expression $9x^2 - 100$ is equivalent to
1 $(9x - 10)(x + 10)$
2 $(3x - 10)(3x + 10)$
3 $(3x - 100)(3x - 1)$
4 $(9x - 100)(x + 1)$

396 Factor completely: $4x^3 - 36x$

397 Which expression is equivalent to $9x^2 - 16$?
1 $(3x + 4)(3x - 4)$
2 $(3x - 4)(3x - 4)$
3 $(3x + 8)(3x - 8)$
4 $(3x - 8)(3x - 8)$

398 If Ann correctly factors an expression that is the difference of two perfect squares, her factors could be
1 $(2x + y)(x - 2y)$
2 $(2x + 3y)(2x - 3y)$
3 $(x - 4)(x - 4)$
4 $(2y - 5)(y - 5)$

399 Which expression is equivalent to $121 - x^2$?
1 $(x - 11)(x - 11)$
2 $(x + 11)(x - 11)$
3 $(11 - x)(11 + x)$
4 $(11 - x)(11 - x)$

400 When $a^3 - 4a$ is factored completely, the result is
1 $(a - 2)(a + 2)$
2 $a(a - 2)(a + 2)$
3 $a^2(a - 4)$
4 $a(a - 2)^2$

401 The expression $x^2 - 36y^2$ is equivalent to
1 $(x - 6y)(x - 6y)$
2 $(x - 18y)(x - 18y)$
3 $(x + 6y)(x - 6y)$
4 $(x + 18y)(x - 18y)$

402 Which expression represents $36x^2 - 100y^6$ factored completely?

1 $2(9x + 25y^3)(9x - 25y^3)$

2 $4(3x + 5y^3)(3x - 5y^3)$

3 $(6x + 10y^3)(6x - 10y^3)$

4 $(18x + 50y^3)(18x - 50y^3)$

403 Which expression is equivalent to $64 - x^2$?

1 $(8 - x)(8 - x)$

2 $(8 - x)(8 + x)$

3 $(x - 8)(x - 8)$

4 $(x - 8)(x + 8)$

404 The expression $9a^2 - 64b^2$ is equivalent to

1 $(9a - 8b)(a + 8b)$

2 $(9a - 8b)(a - 8b)$

3 $(3a - 8b)(3a + 8b)$

4 $(3a - 8b)(3a - 8b)$

405 The expression $100n^2 - 1$ is equivalent to

1 $(10n + 1)(10n - 1)$

2 $(10n - 1)(10n - 1)$

3 $(50n + 1)(50n - 1)$

4 $(50n - 1)(50n - 1)$

A.A.27: SOLVING QUADRATICS BY FACTORING

406 The solution to the equation $x^2 - 6x = 0$ is

1 0, only

2 6, only

3 0 and 6

4 $\pm\sqrt{6}$

407 The solutions of $x^2 = 16x - 28$ are

1 -2 and -14

2 2 and 14

3 -4 and -7

4 4 and 7

A.A.28: ROOTS OF QUADRATICS

408 What are the roots of the equation $x^2 - 10x + 21 = 0$?

1 1 and 21

2 -5 and -5

3 3 and 7

4 -3 and -7

409 What are the roots of the equation $x^2 - 7x + 6 = 0$?

1 1 and 7

2 -1 and 7

3 -1 and -6

4 1 and 6

410 Find the roots of the equation $x^2 - x = 6$ algebraically.

411 Find the roots of the equation $x^2 = 30 - 13x$ algebraically.

412 Which equation has roots of -3 and 5?

1 $x^2 + 2x - 15 = 0$

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

3 $x^2 + 2x + 15 = 0$

4 $x^2 - 2x + 15 = 0$

413 What are the roots of the equation $x^2 - 5x + 6 = 0$?

1 1 and -6

2 2 and 3

3 -1 and 6

4 -2 and -3

414 The roots of the equation $3x^2 - 27x = 0$ are

1 0 and 9

2 0 and -9

3 0 and 3

4 0 and -3

415 The roots of the equation $x^2 - 14x + 48 = 0$ are
    1   −6 and −8
    2   −6 and 8
    3   6 and −8
    4   6 and 8

416 If the roots of a quadratic equation are −2 and 3, the equation can be written as
    1    $(x - 2)(x + 3) = 0$
    2    $(x + 2)(x - 3) = 0$
    3    $(x + 2)(x + 3) = 0$
    4    $(x - 2)(x - 3) = 0$

417 The roots of the equation $2x^2 - 8x = 0$ are
    1   −2 and 2
    2   0, − 2 and 2
    3   0 and −4
    4   0 and 4

A.G.5: GRAPHING QUADRATIC FUNCTIONS

418 Consider the graph of the equation $y = ax^2 + bx + c$, when $a \neq 0$. If a is multiplied by 3, what is true of the graph of the resulting parabola?
    1   The vertex is 3 units above the vertex of the original parabola.
    2   The new parabola is 3 units to the right of the original parabola.
    3   The new parabola is wider than the original parabola.
    4   The new parabola is narrower than the original parabola.

419 The diagram below shows the graph of $y = -x^2 - c$.
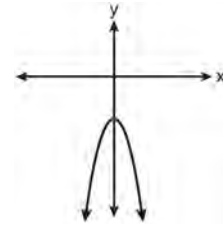
Which diagram shows the graph of $y = x^2 - c$?
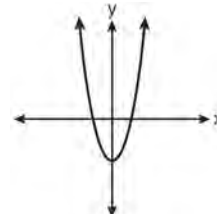
1
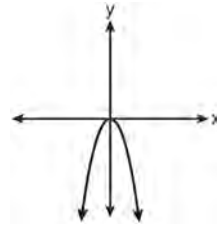
2
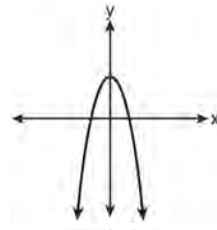
3
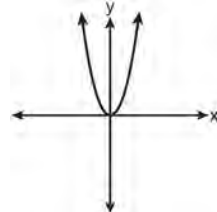
4

420 Melissa graphed the equation $y = x^2$ and Dave graphed the equation $y = -3x^2$ on the same coordinate grid. What is the relationship between the graphs that Melissa and Dave drew?
1   Dave's graph is wider and opens in the opposite direction from Melissa's graph.
2   Dave's graph is narrower and opens in the opposite direction from Melissa's graph.
3   Dave's graph is wider and is three units below Melissa's graph.
4   Dave's graph is narrower and is three units to the left of Melissa's graph.

421 The graph of a parabola is represented by the equation $y = ax^2$ where a is a positive integer. If a is multiplied by 2, the new parabola will become
1   narrower and open downward
2   narrower and open upward
3   wider and open downward
4   wider and open upward

422 How is the graph of $y = x^2 + 4x + 3$ affected when the coefficient of x^2 is changed to a smaller positive number?
1   The graph becomes wider, and the y-intercept changes.
2   The graph becomes wider, and the y-intercept stays the same.
3   The graph becomes narrower, and the y-intercept changes.
4   The graph becomes narrower, and the y-intercept stays the same.

423 Which is the equation of a parabola that has the same vertex as the parabola represented by $y = x^2$, but is wider?
1    $y = x^2 + 2$
2    $y = x^2 - 2$
3    $y = 2x^2$
4    $y = \dfrac{1}{2} x^2$

A.G.8: SOLVING QUADRATICS BY GRAPHING

424 Graph the equation $y = x^2 - 2x - 3$ on the accompanying set of axes. Using the graph, determine the roots of the equation $x^2 - 2x - 3 = 0$.
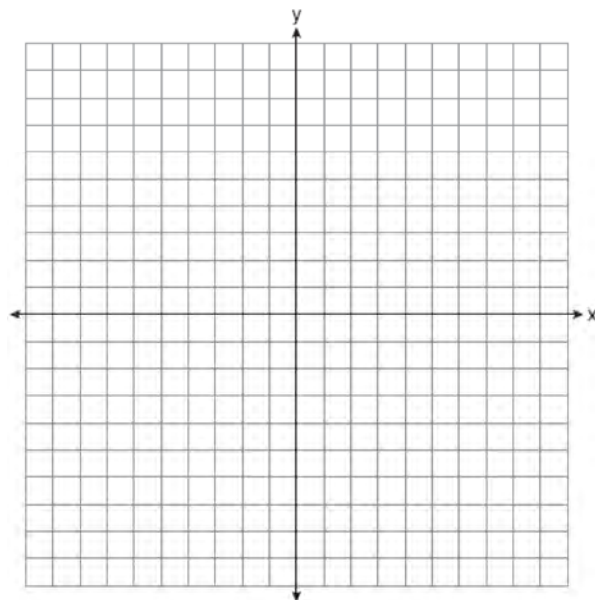
425 The equation $y = x^2 + 3x - 18$ is graphed on the set of axes below.
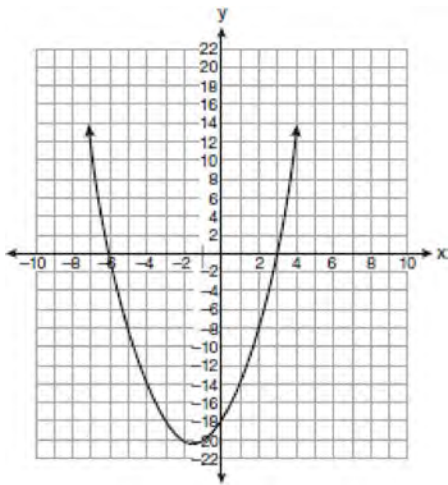
Based on this graph, what are the roots of the equation $x^2 + 3x - 18 = 0$?
1   −3 and 6
2   0 and −18
3   3 and −6
4   3 and −18

426 The equation $y = -x^2 - 2x + 8$ is graphed on the set of axes below.
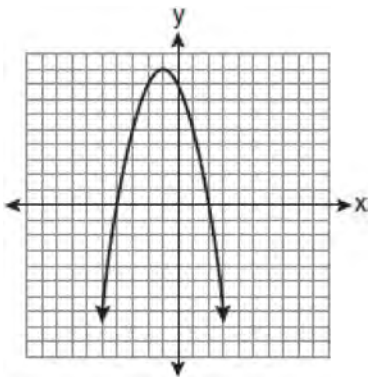
Based on this graph, what are the roots of the equation $-x^2 - 2x + 8 = 0$?
1   8 and 0
2   2 and −4
3   9 and −1
4   4 and −2

427 A student correctly graphed the parabola shown below to solve a given quadratic equation.
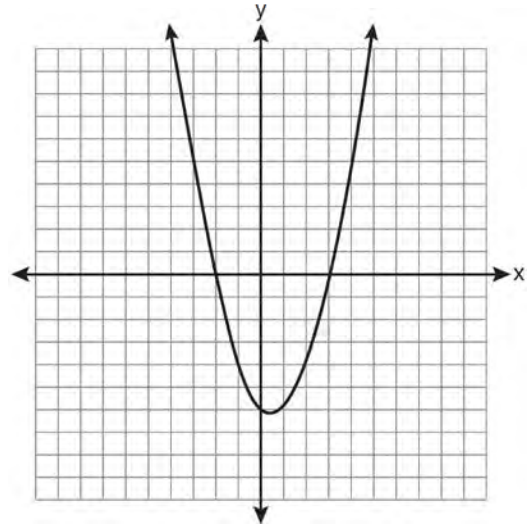
What are the roots of the quadratic equation associated with this graph?
1   −6 and 3
2   −6 and 0
3   −3 and 2
4   −2 and 3

428 On the set of axes below, graph the equation $y = x^2 + 2x - 8$. Using the graph, determine and state the roots of the equation $x^2 + 2x - 8 = 0$.
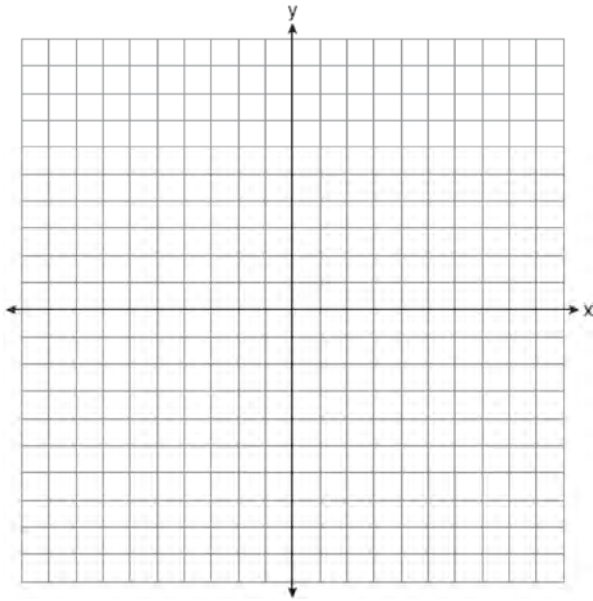
429 The roots of a quadratic equation can be found using the graph below.
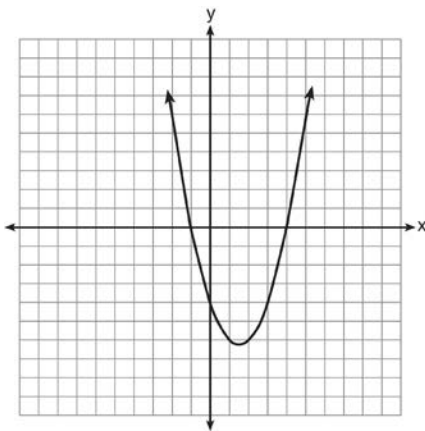
What are the roots of this equation?

1 −4, only
2 −4 and −1
3 −1 and 4
4 −4, −1, and 4

A.A.8: WRITING QUADRATICS

430 Find three consecutive positive even integers such that the product of the second and third integers is twenty more than ten times the first integer. [Only an algebraic solution can receive full credit.]

431 When 36 is subtracted from the square of a number, the result is five times the number. What is the positive solution?

1 9
2 6
3 3
4 4

432 Byron is 3 years older than Doug. The product of their ages is 40. How old is Doug?

1 10
2 8
3 5
4 4

433 Noj is 5 years older than Jacob. The product of their ages is 84. How old is Noj?

1 6
2 7
3 12
4 14

A.A.8: GEOMETRIC APPLICATIONS OF QUADRATICS

434 A contractor needs 54 square feet of brick to construct a rectangular walkway. The length of the walkway is 15 feet more than the width. Write an equation that could be used to determine the dimensions of the walkway. Solve this equation to find the length and width, in feet, of the walkway.

435 A rectangle has an area of 24 square units. The width is 5 units less than the length. What is the length, in units, of the rectangle?

1 6
2 8
3 3
4 19

436 The length of a rectangle is 3 inches more than its width. The area of the rectangle is 40 square inches. What is the length, in inches, of the rectangle?
1 5
2 8
3 8.5
4 11.5

A.G.10: IDENTIFYING THE VERTEX OF A QUADRATIC GIVEN GRAPH

437 What are the vertex and the axis of symmetry of the parabola shown in the diagram below?
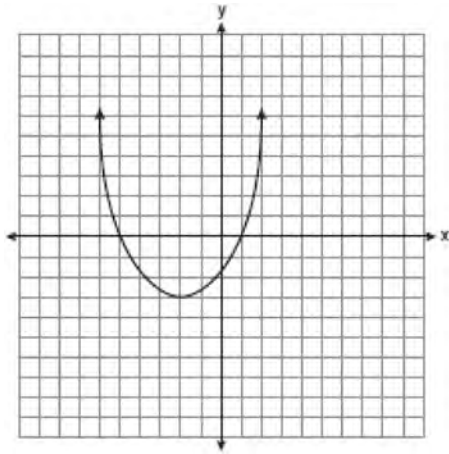
1 The vertex is $(-2, -3)$, and the axis of symmetry is $x = -2$.
2 The vertex is $(-2, -3)$, and the axis of symmetry is $y = -2$.
3 The vertex is $(-3, -2)$, and the axis of symmetry is $y = -2$.
4 The vertex is $(-3, -2)$, and the axis of symmetry is $x = -2$.

438 A swim team member performs a dive from a 14-foot-high springboard. The parabola below shows the path of her dive.
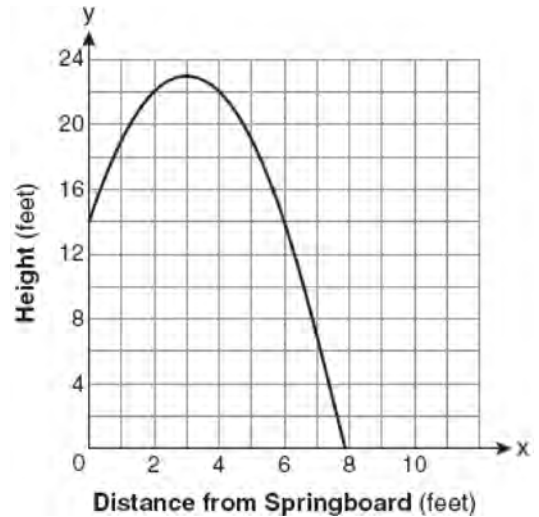
Which equation represents the axis of symmetry?
1 $x = 3$
2 $y = 3$
3 $x = 23$
4 $y = 23$

439 Which equation represents the axis of symmetry of the graph of the parabola below?

1 $y = -3$
2 $x = -3$
3 $y = -25$
4 $x = -25$

73
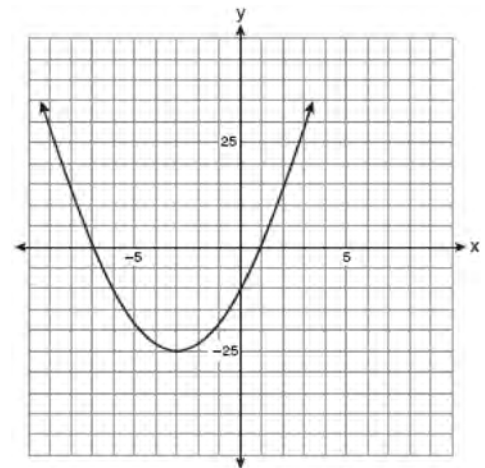
440 What is the equation of the axis of symmetry of the parabola shown in the diagram below?
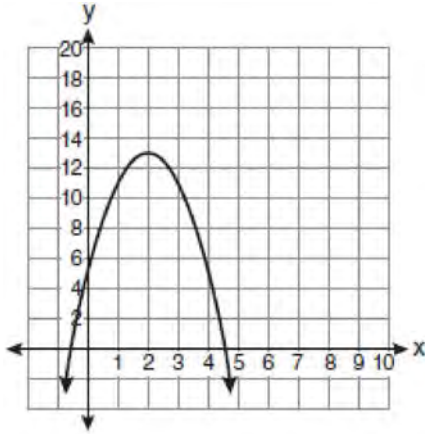
1   $x = -0.5$
2   $x = 2$
3   $x = 4.5$
4   $x = 13$

441 What are the vertex and axis of symmetry of the parabola shown in the diagram below?
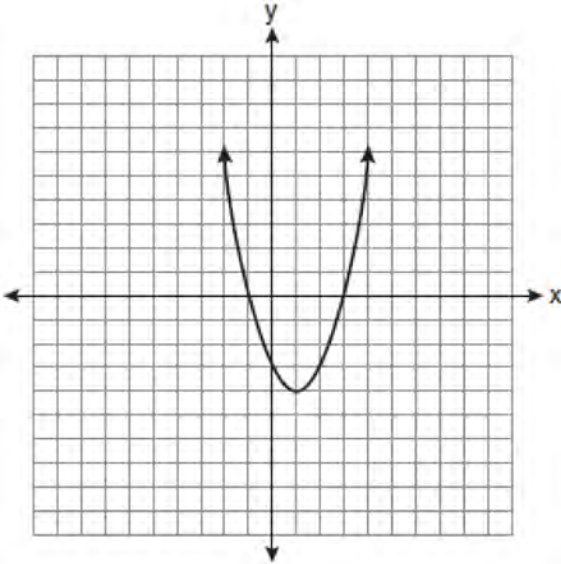
1   vertex: $(1, -4)$; axis of symmetry: $x = 1$
2   vertex: $(1, -4)$; axis of symmetry: $x = -4$
3   vertex: $(-4, 1)$; axis of symmetry: $x = 1$
4   vertex: $(-4, 1)$; axis of symmetry: $x = -4$

442 State the equation of the axis of symmetry and the coordinates of the vertex of the parabola graphed below.
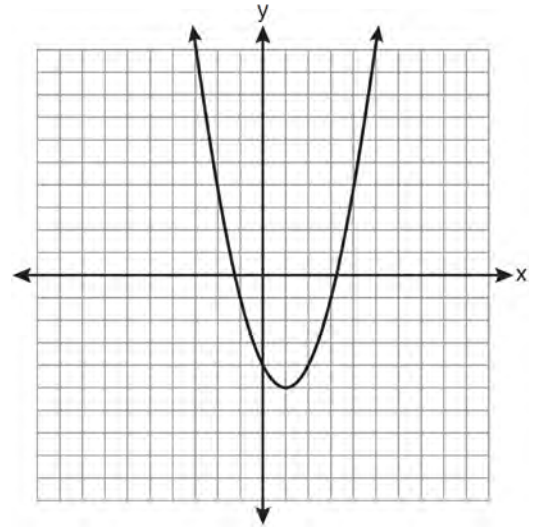
443 What are the vertex and the axis of symmetry of the parabola shown in the graph below?
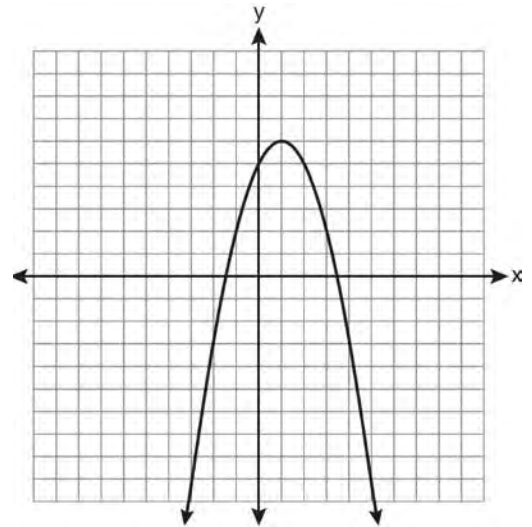
1   vertex: $(1, 6)$; axis of symmetry: $y = 1$
2   vertex: $(1, 6)$; axis of symmetry: $x = 1$
3   vertex: $(6, 1)$; axis of symmetry: $y = 1$
4   vertex: $(6, 1)$; axis of symmetry: $x = 1$

444 What are the coordinates of the vertex and the equation of the axis of symmetry of the parabola shown in the graph below?
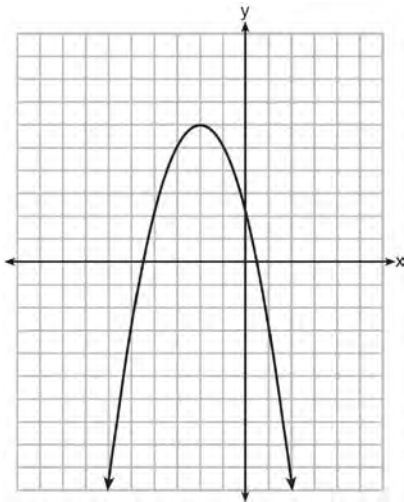
1 $(0,2)$ and $y = 2$
2 $(0,2)$ and $x = 2$
3 $(-2,6)$ and $y = -2$
4 $(-2,6)$ and $x = -2$

A.A.41: IDENTIFYING THE VERTEX OF A QUADRATIC GIVEN EQUATION

445 What are the vertex and axis of symmetry of the parabola $y = x^2 - 16x + 63$?
1 vertex: $(8,-1)$; axis of symmetry: $x = 8$
2 vertex: $(8,1)$; axis of symmetry: $x = 8$
3 vertex: $(-8,-1)$; axis of symmetry: $x = -8$
4 vertex: $(-8,1)$; axis of symmetry: $x = -8$

446 Find algebraically the equation of the axis of symmetry and the coordinates of the vertex of the parabola whose equation is $y = -2x^2 - 8x + 3$.

447 The height, y, of a ball tossed into the air can be represented by the equation $y = -x^2 + 10x + 3$, where x is the elapsed time. What is the equation of the axis of symmetry of this parabola?
1 $y = 5$
2 $y = -5$
3 $x = 5$
4 $x = -5$

448 What is an equation of the axis of symmetry of the parabola represented by $y = -x^2 + 6x - 4$?
1 $x = 3$
2 $y = 3$
3 $x = 6$
4 $y = 6$

449 The equation of the axis of symmetry of the graph of $y = 2x^2 - 3x + 7$ is
1 $x = \dfrac{3}{4}$
2 $y = \dfrac{3}{4}$
3 $x = \dfrac{3}{2}$
4 $y = \dfrac{3}{2}$

450 What is the vertex of the parabola represented by the equation $y = -2x^2 + 24x - 100$?
1 $x = -6$
2 $x = 6$
3 $(6,-28)$
4 $(-6,-316)$

451 The vertex of the parabola $y = x^2 + 8x + 10$ lies in Quadrant
1 I
2 II
3 III
4 IV

452 What is the vertex of the graph of the equation $y = 3x^2 + 6x + 1$?
1 $(-1, -2)$
2 $(-1, 10)$
3 $(1, -2)$
4 $(1, 10)$

SYSTEMS
A.A.10: SOLVING LINEAR SYSTEMS

453 The equations $5x + 2y = 48$ and $3x + 2y = 32$ represent the money collected from school concert ticket sales during two class periods. If x represents the cost for each adult ticket and y represents the cost for each student ticket, what is the cost for each adult ticket?
1 $20
2 $10
3 $8
4 $4

454 Solve the following system of equations algebraically:
$$3x + 2y = 4$$
$$4x + 3y = 7$$
[Only an algebraic solution can receive full credit.]

455 What is the value of the y-coordinate of the solution to the system of equations $x + 2y = 9$ and $x - y = 3$?
1 6
2 2
3 3
4 5

456 What is the value of the y-coordinate of the solution to the system of equations $x - 2y = 1$ and $x + 4y = 7$?
1 1
2 -1
3 3
4 4

457 What is the solution of the system of equations $c + 3d = 8$ and $c = 4d - 6$?
1 $c = -14, d = -2$
2 $c = -2, d = 2$
3 $c = 2, d = 2$
4 $c = 14, d = -2$

458 What is the value of the y-coordinate of the solution to the system of equations $2x + y = 8$ and $x - 3y = -3$?
1 -2
2 2
3 3
4 -3

459 What is the solution of the system of equations $2x - 5y = 11$ and $-2x + 3y = -9$?
1 $(-3, -1)$
2 $(-1, 3)$
3 $(3, -1)$
4 $(3, 1)$

460 Solve the following system of equations algebraically for y:
$$2x + 2y = 9$$
$$2x - y = 3$$

461 Using the substitution method, Ken solves the following system of equations algebraically.
$$2x - y = 5$$
$$3x + 2y = -3$$
Which equivalent equation could Ken use?
1 $3x + 2(2x - 5) = -3$
2 $3x + 2(5 - 2x) = -3$
3 $3\left(y + \dfrac{5}{2}\right) + 2y = -3$
4 $3\left(\dfrac{5}{2} - y\right) + 2y = -3$

462 What is the solution of the system of equations below?

$$2x + 3y = 7$$

$$x + y = 3$$

1   $(1, 2)$
2   $(2, 1)$
3   $(4, -1)$
4   $(4, 1)$

A.G.7: SOLVING LINEAR SYSTEMS

463 On the grid below, solve the system of equations graphically for x and y.

$$4x - 2y = 10$$

$$y = -2x - 1$$
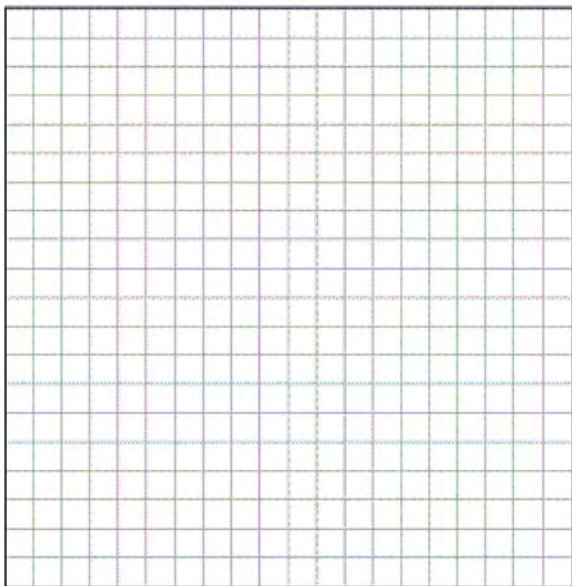
464 On the set of axes below, solve the following system of equations graphically. State the coordinates of the solution.

$$y = 4x - 1$$

$$2x + y = 5$$
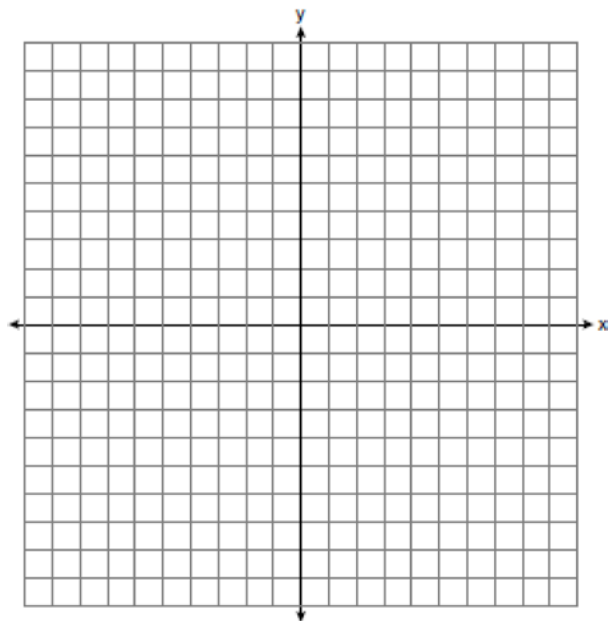
465 A system of equations is graphed on the set of axes below.
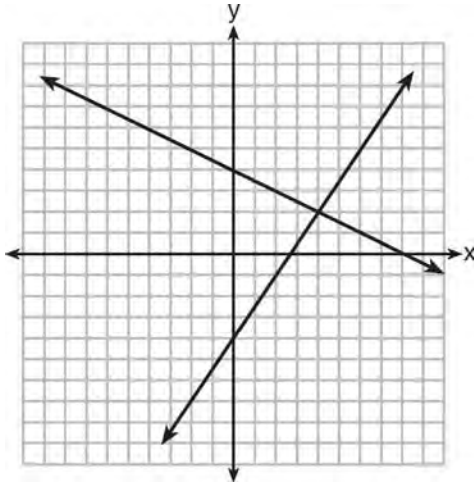
The solution of this system is
1 $(0,4)$
2 $(2,4)$
3 $(4,2)$
4 $(8,0)$

466 What is the solution of the system of equations shown in the graph below?
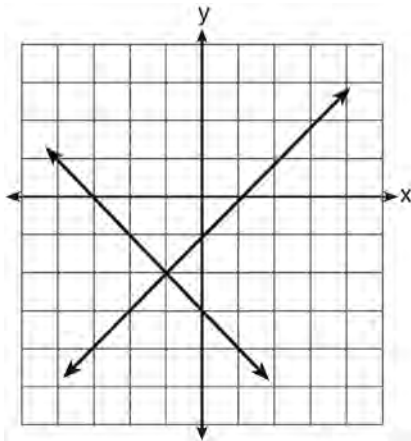
1 $(1,0)$ and $(-3,0)$
2 $(0,-3)$ and $(0,-1)$
3 $(-1,-2)$
4 $(-2,-1)$

A.A.7: WRITING LINEAR SYSTEMS

467 Jack bought 3 slices of cheese pizza and 4 slices of mushroom pizza for a total cost of $12.50. Grace bought 3 slices of cheese pizza and 2 slices of mushroom pizza for a total cost of $8.50. What is the cost of one slice of mushroom pizza?
1 $1.50
2 $2.00
3 $3.00
4 $3.50

468 Pam is playing with red and black marbles. The number of red marbles she has is three more than twice the number of black marbles she has. She has 42 marbles in all. How many red marbles does Pam have?
1 13
2 15
3 29
4 33

469 Sam and Odel have been selling frozen pizzas for a class fundraiser. Sam has sold half as many pizzas as Odel. Together they have sold a total of 126 pizzas. How many pizzas did Sam sell?
1 21
2 42
3 63
4 84

470 The cost of 3 markers and 2 pencils is $1.80. The cost of 4 markers and 6 pencils is $2.90. What is the cost of *each* item? Include appropriate units in your answer.

471 The sum of two numbers is 47, and their difference is 15. What is the larger number?
1 16
2 31
3 32
4 36

472 At Genesee High School, the sophomore class has 60 more students than the freshman class. The junior class has 50 fewer students than twice the students in the freshman class. The senior class is three times as large as the freshman class. If there are a total of 1,424 students at Genesee High School, how many students are in the freshman class?
1   202
2   205
3   235
4   236

473 Julia went to the movies and bought one jumbo popcorn and two chocolate chip cookies for $5.00. Marvin went to the same movie and bought one jumbo popcorn and four chocolate chip cookies for $6.00. How much does one chocolate chip cookie cost?
1   $0.50
2   $0.75
3   $1.00
4   $2.00

474 Josh and Mae work at a concession stand. They each earn $8 per hour. Josh worked three hours more than Mae. If Josh and Mae earned a total of $120, how many hours did Josh work?
1   6
2   9
3   12
4   15

475 Michael is 25 years younger than his father. The sum of their ages is 53. What is Michael's age?
1   14
2   25
3   28
4   39

476 Ben has four more than twice as many CDs as Jake. If they have a total of 31 CDs, how many CDs does Jake have?
1   9
2   13
3   14
4   22

477 The total score in a football game was 72 points. The winning team scored 12 points more than the losing team. How many points did the winning team score?
1   30
2   42
3   54
4   60

478 The cost of three notebooks and four pencils is $8.50. The cost of five notebooks and eight pencils is $14.50. Determine the cost of one notebook and the cost of one pencil. [Only an algebraic solution can receive full credit.]

479 The difference between two numbers is 28. The larger number is 8 less than twice the smaller number. Find *both* numbers. [Only an algebraic solution can receive full credit.]

A.A.40: SYSTEMS OF LINEAR INEQUALITIES

480 Which ordered pair is in the solution set of the following system of inequalities?
$$y < \frac{1}{2}x + 4$$
$$y \geq -x + 1$$
1   $(-5, 3)$
2   $(0, 4)$
3   $(3, -5)$
4   $(4, 0)$

481 Which ordered pair is in the solution set of the following system of linear inequalities?
$$y < 2x + 2$$
$$y \geq -x - 1$$
1   $(0, 3)$
2   $(2, 0)$
3   $(-1, 0)$
4   $(-1, -4)$

482 Which ordered pair is in the solution set of the system of linear inequalities graphed below?
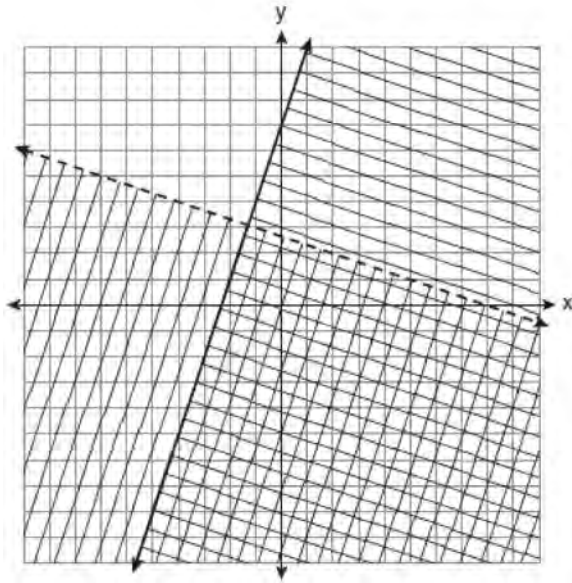
1 $(1,-4)$
2 $(-5,7)$
3 $(5,3)$
4 $(-7,-2)$

483 Which ordered pair is in the solution set of the system of inequalities shown in the graph below?
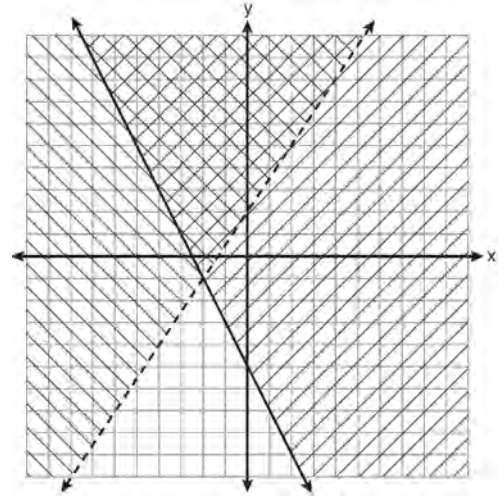
1 $(-2,-1)$
2 $(-2,2)$
3 $(-2,-4)$
4 $(2,-2)$

484 Which coordinates represent a point in the solution set of the system of inequalities shown below?

$$y \le \frac{1}{2}x + 13$$

$$4x + 2y > 3$$

1 $(-4,1)$
2 $(-2,2)$
3 $(1,-4)$
4 $(2,-2)$

485 Which ordered pair is in the solution set of the system of inequalities $y \le 3x + 1$ and $x - y > 1$?
1 $(-1,-2)$
2 $(2,-1)$
3 $(1,2)$
4 $(-1,2)$

A.G.7: SYSTEMS OF LINEAR INEQUALITIES

486   On the set of axes below, graph the following system of inequalities and state the coordinates of a point in the solution set.

$$2x - y \geq 6$$

$$x > 2$$
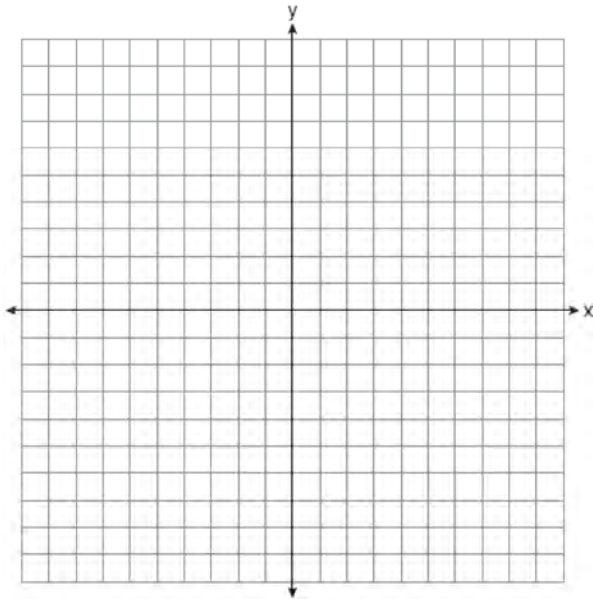
487   On the set of axes below, solve the following system of inequalities graphically.

$$y < 2x + 1$$

$$y \geq -\frac{1}{3}x + 4$$

State the coordinates of a point in the solution set.
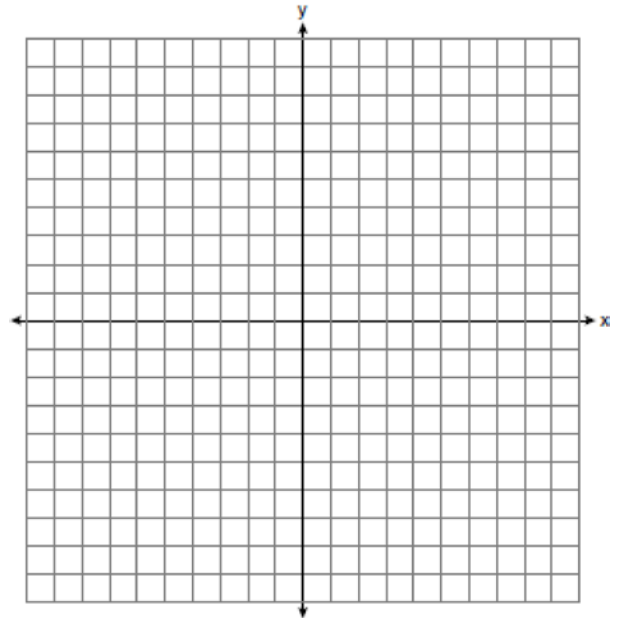
488 Graph the following systems of inequalities on the set of axes shown below and label the solution set S:

$$y > -x + 2$$

$$y \leq \frac{2}{3}x + 5$$
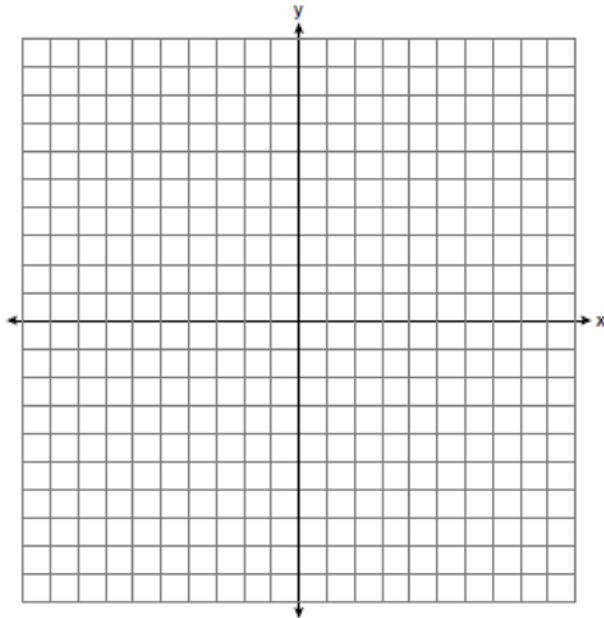
489 Solve the following system of inequalities graphically on the set of axes below.

$$3x + y < 7$$

$$y \geq \frac{2}{3}x - 4$$

State the coordinates of a point in the solution set.
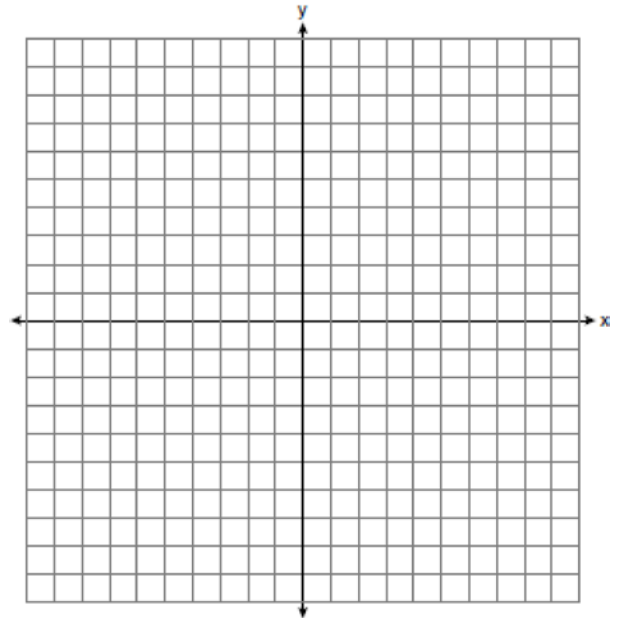
490 On the set of axes below, graph the following system of inequalities.

$$y + x \geq 3$$

$$5x - 2y > 10$$

State the coordinates of *one* point that satisfies $y + x \geq 3$, but does *not* satisfy $5x - 2y > 10$.
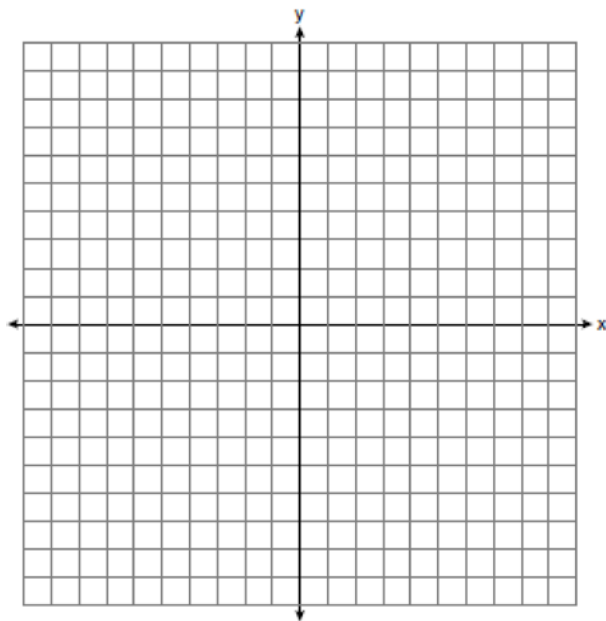
A.A.11: QUADRATIC-LINEAR SYSTEMS

491 Which ordered pair is a solution to the system of equations $y = x$ and $y = x^2 - 2$?
1 $(-2, -2)$
2 $(-1, 1)$
3 $(0, 0)$
4 $(2, 2)$

492 Which ordered pair is in the solution set of the system of equations $y = -x + 1$ and $y = x^2 + 5x + 6$?
1 $(-5, -1)$
2 $(-5, 6)$
3 $(5, -4)$
4 $(5, 2)$

493 Which ordered pair is a solution of the system of equations $y = x^2 - x - 20$ and $y = 3x - 15$?
1 $(-5, -30)$
2 $(-1, -18)$
3 $(0, 5)$
4 $(5, -1)$

494 Which ordered pair is a solution to the system of equations $y = x + 3$ and $y = x^2 - x$?
1 $(6, 9)$
2 $(3, 6)$
3 $(3, -1)$
4 $(2, 5)$

495 What is the solution set of the system of equations $x + y = 5$ and $y = x^2 - 25$?
1 $\{(0, 5), (11, -6)\}$
2 $\{(5, 0), (-6, 11)\}$
3 $\{(-5, 0), (6, 11)\}$
4 $\{(-5, 10), (6, -1)\}$

496 Solve the following system of equations algebraically for *all* values of x and y.

$$y = x^2 + 2x - 8$$

$$y = 2x + 1$$

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

A.G.9: QUADRATIC-LINEAR SYSTEMS

497 Solve the following systems of equations graphically, on the set of axes below, and state the coordinates of the point(s) in the solution set.

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

$$2x + y = 5$$
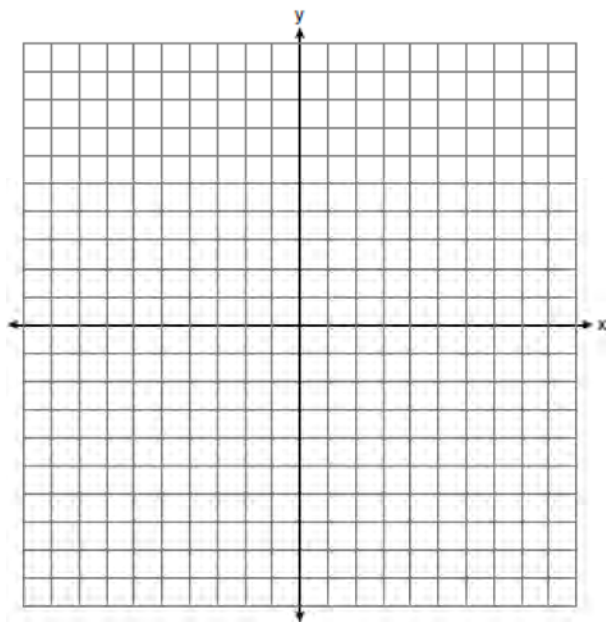
498 On the set of axes below, solve the following system of equations graphically and state the coordinates of all points in the solution set.

$$y = x^2 + 4x - 5$$

$$y = x - 1$$
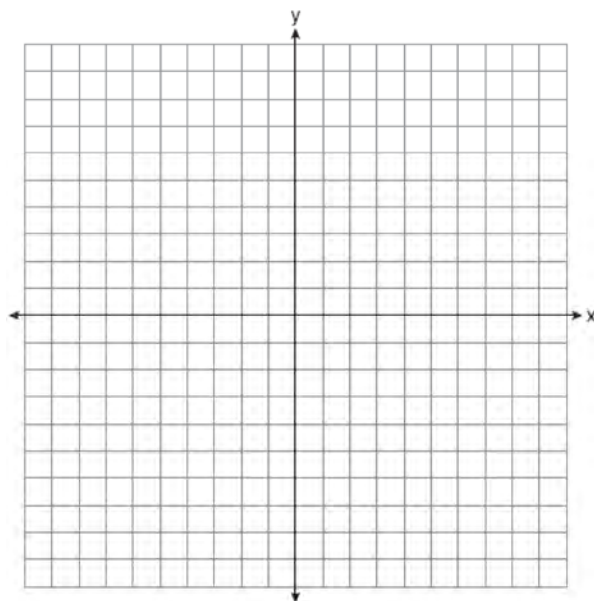
499 On the set of axes below, solve the following system of equations graphically for all values of x and y.

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

$$y + 2x = 6$$
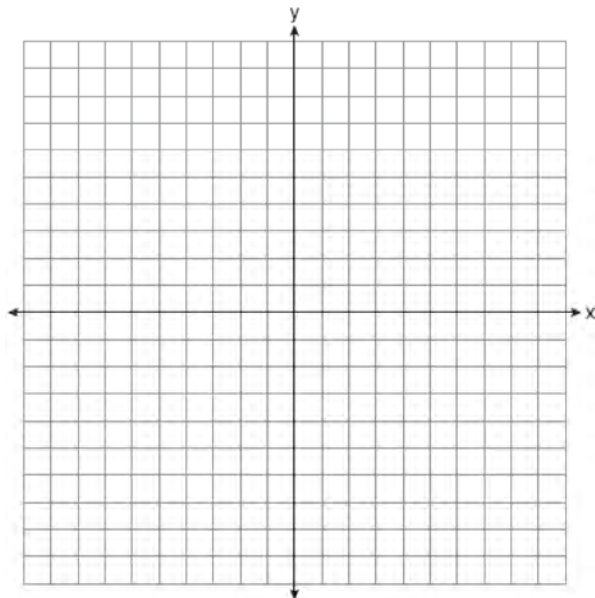
500 Which ordered pair is a solution of the system of equations shown in the graph below?
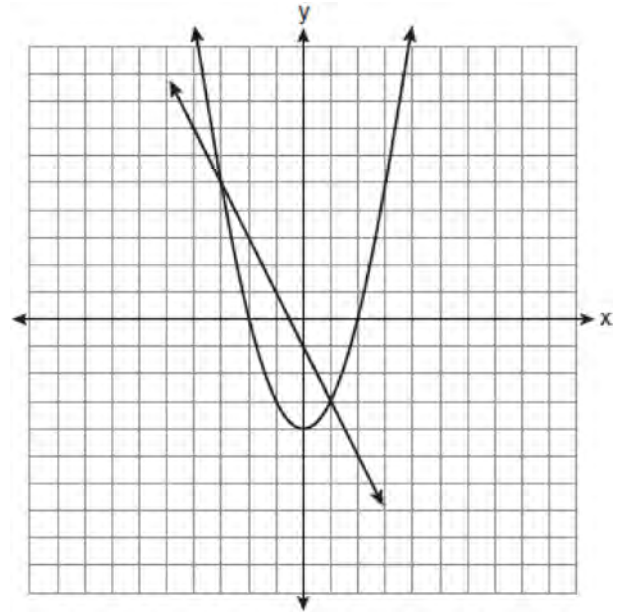
1 $(-3, 1)$
2 $(-3, 5)$
3 $(0, -1)$
4 $(0, -4)$

501 On the set of axes below, solve the following system of equations graphically for all values of x and y.

$$y = -x^2 - 4x + 12$$

$$y = -2x + 4$$
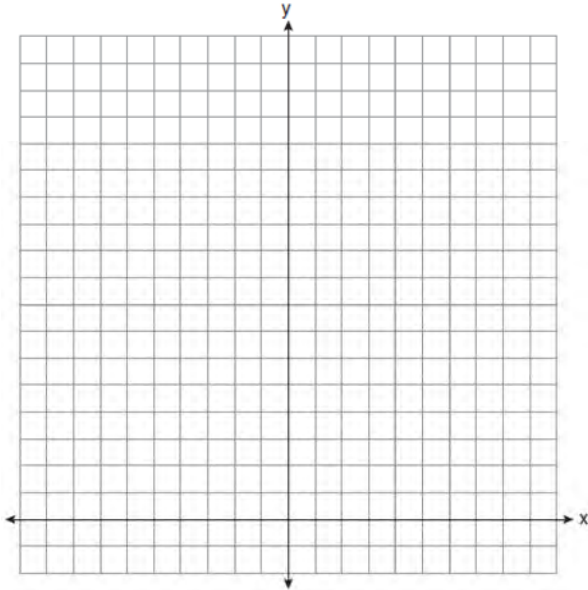
502 Which graph can be used to find the solution of the following system of equations?

$$y = x^2 + 2x + 3$$

$$2y - 2x = 10$$

1

2

3

4
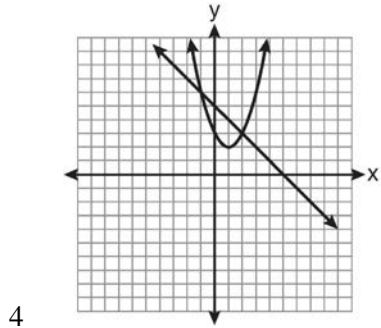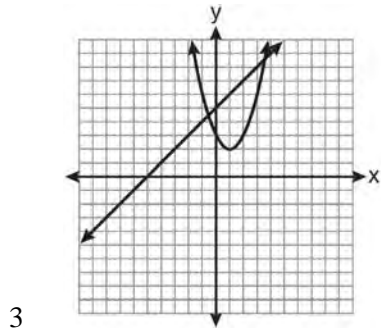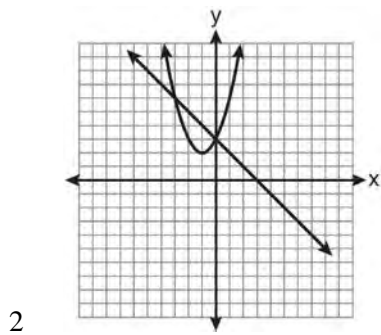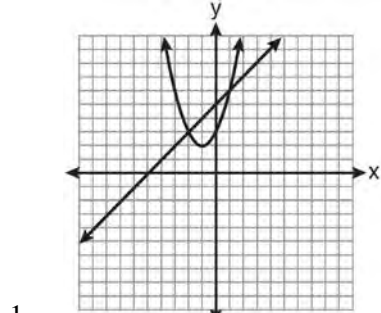
503 Which graph could be used to find the solution of the system of equations $y = 2x + 6$ and $y = x^2 + 4x + 3$?

1

2

3

4
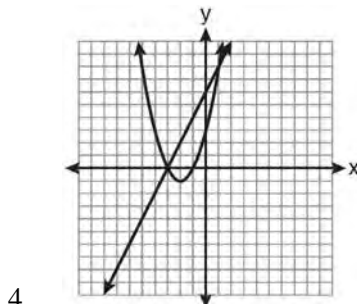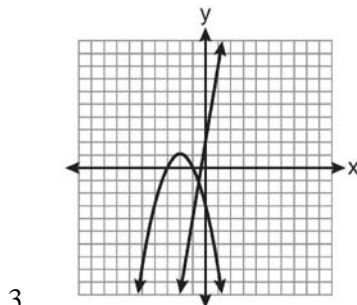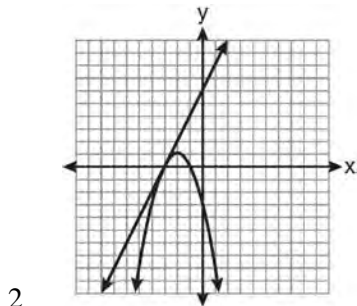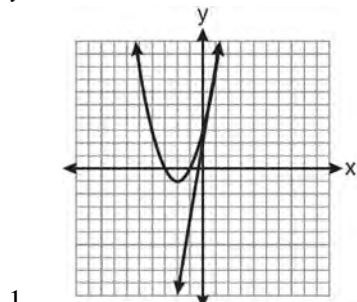
504 On the set of axes below, solve the following system of equations graphically and state the coordinates of *all* points in the solution set.

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

$$x + y = 7$$
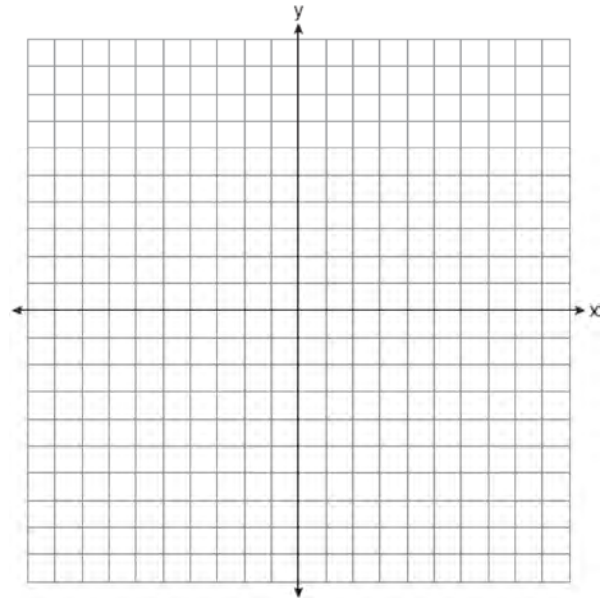
505 Two equations were graphed on the set of axes below.
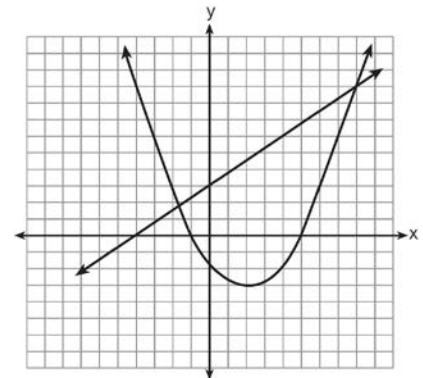
Which point is a solution of the system of equations shown on the graph?

1    $(8, 9)$

2    $(5, 0)$

3    $(0, 3)$

4    $(2, -3)$

506 On the set of axes below, graph the following system of equations.

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

$$y - x = 4$$

Using the graph, determine and state the coordinates of *all* points in the solution set for the system of equations.
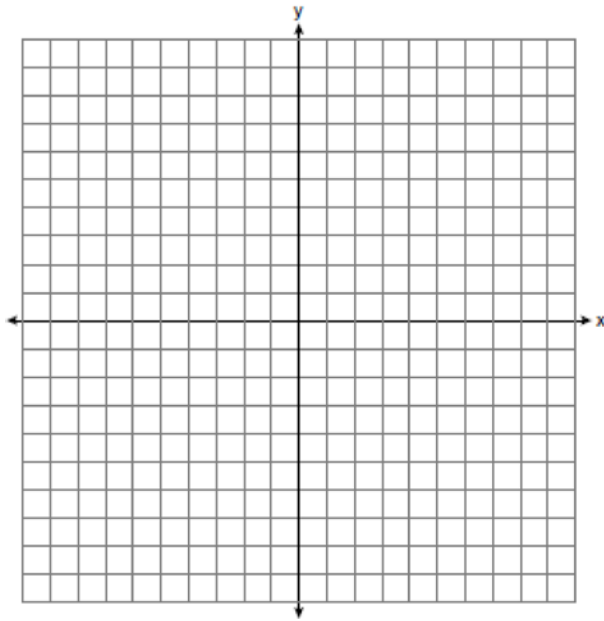
508 On the set of axes below, graph the following system of equations. Using the graph, determine and state *all* solutions of the system of equations.

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

$$y + 1 = -2x$$
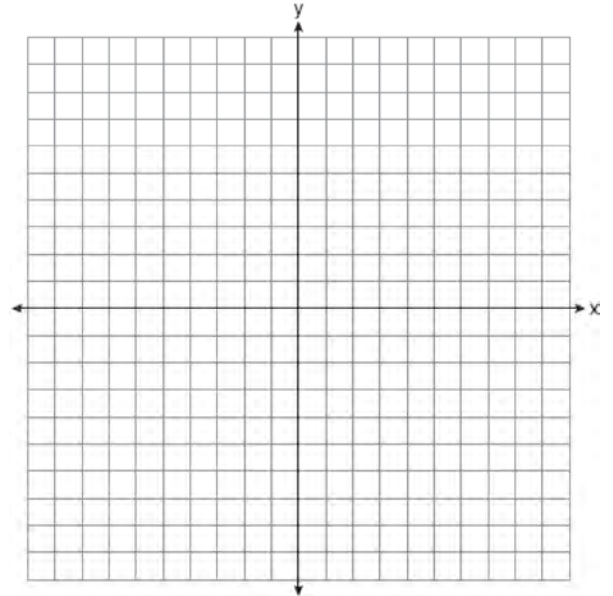
507 How many solutions are there for the following system of equations?

$$y = x^2 - 5x + 3$$

$$y = x - 6$$

1 1
2 2
3 3
4 0

509 On the set of axes below, solve the following system of equations graphically for all values of x and y. State the coordinates of all solutions.

$$y = x^2 + 4x - 5$$

$$y = 2x + 3$$
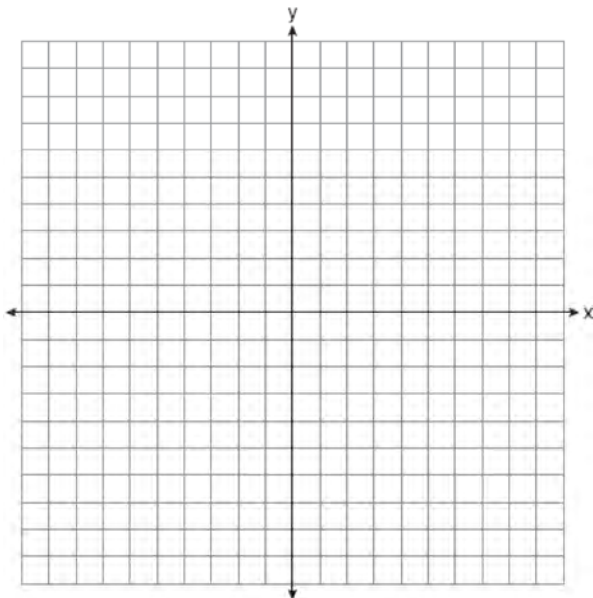
POWERS
A.A.13: ADDITION AND SUBTRACTION OF MONOMIALS

510 Which expression is equivalent to $-3x(x - 4) - 2x(x + 3)$?

1 $-x^2 - 1$

2 $-x^2 + 18x$

3 $-5x^2 - 6x$

4 $-5x^2 + 6x$

A.A.13: ADDITION AND SUBTRACTION OF POLYNOMIALS

511 When $3g^2 - 4g + 2$ is subtracted from $7g^2 + 5g - 1$, the difference is

1 $-4g^2 - 9g + 3$

2 $4g^2 + g + 1$

3 $4g^2 + 9g - 3$

4 $10g^2 + g + 1$

512 When $4x^2 + 7x - 5$ is subtracted from $9x^2 - 2x + 3$, the result is

1 $5x^2 + 5x - 2$

2 $5x^2 - 9x + 8$

3 $-5x^2 + 5x - 2$

4 $-5x^2 + 9x - 8$

513 The sum of $4x^3 + 6x^2 + 2x - 3$ and $3x^3 + 3x^2 - 5x - 5$ is

1 $7x^3 + 3x^2 - 3x - 8$

2 $7x^3 + 3x^2 + 7x + 2$

3 $7x^3 + 9x^2 - 3x - 8$

4 $7x^6 + 9x^4 - 3x^2 - 8$

514 What is the result when $2x^2 + 3xy - 6$ is subtracted from $x^2 - 7xy + 2$?

1 $-x^2 - 10xy + 8$

2 $x^2 + 10xy - 8$

3 $-x^2 - 4xy - 4$

4 $x^2 - 4xy - 4$

515 When $5x + 4y$ is subtracted from $5x - 4y$, the difference is

1 0

2 $10x$

3 $8y$

4 $-8y$

516 What is the sum of $-3x^2 - 7x + 9$ and $-5x^2 + 6x - 4$?
1 $-8x^2 - x + 5$
2 $-8x^4 - x + 5$
3 $-8x^2 - 13x + 13$
4 $-8x^4 - 13x^2 + 13$

517 When $8x^2 + 3x + 2$ is subtracted from $9x^2 - 3x - 4$, the result is
1 $x^2 - 2$
2 $17x^2 - 2$
3 $-x^2 + 6x + 6$
4 $x^2 - 6x - 6$

518 The sum of $3x^2 + 5x - 6$ and $-x^2 + 3x + 9$ is
1 $2x^2 + 8x - 15$
2 $2x^2 + 8x + 3$
3 $2x^4 + 8x^2 + 3$
4 $4x^2 + 2x - 15$

519 When $2x^2 - 3x + 2$ is subtracted from $4x^2 - 5x + 2$, the result is
1 $2x^2 - 2x$
2 $-2x^2 + 2x$
3 $-2x^2 - 8x + 4$
4 $2x^2 - 8x + 4$

520 The sum of $8n^2 - 3n + 10$ and $-3n^2 - 6n - 7$ is
1 $5n^2 - 9n + 3$
2 $5n^2 - 3n - 17$
3 $-11n^2 - 9n - 17$
4 $-11n^2 - 3n + 3$

521 What is the result when $4x^2 - 17x + 36$ is subtracted from $2x^2 - 5x + 25$?
1 $6x^2 - 22x + 61$
2 $2x^2 - 12x + 11$
3 $-2x^2 - 22x + 61$
4 $-2x^2 + 12x - 11$

A.A.13: MULTIPLICATION OF POLYNOMIALS

522 What is the product of $-3x^2 y$ and $(5xy^2 + xy)$?
1 $-15x^3y^3 - 3x^3y^2$
2 $-15x^3y^3 - 3x^3y$
3 $-15x^2y^2 - 3x^2y$
4 $-15x^3y^3 + xy$

523 What is the product of $(3x + 2)$ and $(x - 7)$?
1 $3x^2 - 14$
2 $3x^2 - 5x - 14$
3 $3x^2 - 19x - 14$
4 $3x^2 - 23x - 14$

A.A.14: DIVISION OF POLYNOMIALS

524 Which expression represents $\dfrac{12x^3 - 6x^2 + 2x}{2x}$ in simplest form?
1 $6x^2 - 3x$
2 $10x^2 - 4x$
3 $6x^2 - 3x + 1$
4 $10x^2 - 4x + 1$

525 Express in simplest form: $\dfrac{45a^4b^3 - 90a^3b}{15a^2b}$

526 The quotient of $\dfrac{8x^5 - 2x^4 + 4x^3 - 6x^2}{2x^2}$ is
1 $16x^7 - 4x^6 + 8x^5 - 12x^4$
2 $`4x^7 - x^6 + 2x^5 - 3x^4$
3 $4x^3 - x^2 + 2x - 3x$
4 $4x^3 - x^2 + 2x - 3$

527 What is $24x^2y^6 - 16x^6y^2 + 4xy^2$ divided by $4xy^2$?

1   $6xy^4 - 4x^5$

2   $6xy^4 - 4x^5 + 1$

3   $6x^2y^3 - 4x^6y$

4   $6x^2y^3 - 4x^6y + 1$

528 When $16x^3 - 12x^2 + 4x$ is divided by $4x$, the quotient is

1   $12x^2 - 8x$

2   $12x^2 - 8x + 1$

3   $4x^2 - 3x$

4   $4x^2 - 3x + 1$

A.A.12: MULTIPLICATION OF POWERS

529 Which expression represents $(3x^2y^4)(4xy^2)$ in simplest form?

1   $12x^2y^8$

2   $12x^2y^6$

3   $12x^3y^8$

4   $12x^3y^6$

530 Which expression is equivalent to $3^3 \cdot 3^4$?

1   9^{12}

2   9^7

3   3^{12}

4   3^7

A.A.12: DIVISION OF POWERS

531 Which expression represents $\dfrac{(2x^3)(8x^5)}{4x^6}$ in simplest form?

1   x^2

2   x^9

3   $4x^2$

4   $4x^9$

532 What is half of 2^6?

1   1^3

2   1^6

3   2^3

4   2^5

533 Simplify: $\dfrac{27k^5m^8}{(4k^3)(9m^2)}$

534 Which expression represents $\dfrac{27x^{18}y^5}{9x^6y}$ in simplest form?

1   $3x^{12}y^4$

2   $3x^3y^5$

3   $18x^{12}y^4$

4   $18x^3y^5$

535 Which expression represents $\dfrac{-14a^2c^8}{7a^3c^2}$ in simplest form?

1   $-2ac^4$

2   $-2ac^6$

3   $\dfrac{-2c^4}{a}$

4   $\dfrac{-2c^6}{a}$

536 The expression $\dfrac{12w^9y^3}{-3w^3y^3}$ is equivalent to

1   $-4w^6$

2   $-4w^3y$

3   $9w^6$

4   $9w^3y$

537 What is one-third of 3^6?

1 1^2

2 3^2

3 3^5

4 9^6

538 The product of $\dfrac{4x^2}{7y^2}$ and $\dfrac{21y^3}{20x^4}$, expressed in simplest form, is

1 $0.6x^2y$

2 $\dfrac{3y}{5x^2}$

3 $\dfrac{12x^2y^3}{20x^4y^2}$

4 $\dfrac{84x^2y^3}{140x^4y^2}$

A.A.12: POWERS OF POWERS

539 Which expression is equivalent to $(3x^2)^3$?

1 $9x^5$

2 $9x^6$

3 $27x^5$

4 $27x^6$

540 The expression $\dfrac{(10w^3)^2}{5w}$ is equivalent to

1 $2w^5$

2 $2w^8$

3 $20w^5$

4 $20w^8$

541 The expression $\dfrac{\left(4x^3\right)^2}{2x}$ is equivalent to

1 $4x^4$

2 $4x^5$

3 $8x^4$

4 $8x^5$

542 If the expression $(2y^a)^4$ is equivalent to $16y^8$, what is the value of a?

1 12

2 2

3 32

4 4

543 Which equation is true?

1 $\dfrac{c^5}{d^7} \div \dfrac{d^3}{c} = \dfrac{c^4}{d^4}$

2 $(-2m^2p)^3 = -8m^6p^3$

3 $\left(\dfrac{s^3t^8}{s^4t^5}\right)^2 = \dfrac{t^5}{s^2}$

4 $(-2a^2b^3)(3ab^2) = a^3b^5$

A.N.4: OPERATIONS WITH SCIENTIFIC NOTATION

544 What is the quotient of 8.05×10^6 and 3.5×10^2?

1 2.3×10^3

2 2.3×10^4

3 2.3×10^8

4 2.3×10^{12}

545 What is the product of 8.4×10^8 and 4.2×10^3 written in scientific notation?

1 2.0×10^5

2 12.6×10^{11}

3 35.28×10^{11}

4 3.528×10^{12}

546 What is the product of 12 and 4.2×10^6 expressed in scientific notation?
   1   50.4×10^6
   2   50.4×10^7
   3   5.04×10^6
   4   5.04×10^7

547 The quotient of (9.2×10^6) and (2.3×10^2) expressed in scientific notation is
   1   4,000
   2   40,000
   3   4×10^3
   4   4×10^4

548 What is the product of (6×10^3), (4.6×10^5), and (2×10^{-2}) expressed in scientific notation?
   1   55.2×10^6
   2   5.52×10^7
   3   55.2×10^7
   4   5.52×10^{10}

549 State the value of the expression
$$\frac{(4.1 \times 10^2)(2.4 \times 10^3)}{(1.5 \times 10^7)}$$ in scientific notation.

550 The expression $\dfrac{6 \times 10^{-7}}{3 \times 10^{-3}}$ is equivalent to
   1   2×10^4
   2   2×10^{10}
   3   2×10^{-4}
   4   2×10^{-10}

A.A.9: EXPONENTIAL FUNCTIONS

551 Daniel's Print Shop purchased a new printer for $35,000. Each year it depreciates (loses value) at a rate of 5%. What will its approximate value be at the end of the fourth year?
   1   $33,250.00
   2   $30,008.13
   3   $28,507.72
   4   $27,082.33

552 Kathy plans to purchase a car that depreciates (loses value) at a rate of 14% per year. The initial cost of the car is $21,000. Which equation represents the value, v, of the car after 3 years?
   1   $v = 21,000(0.14)^3$
   2   $v = 21,000(0.86)^3$
   3   $v = 21,000(1.14)^3$
   4   $v = 21,000(0.86)(3)$

553 The New York Volleyball Association invited 64 teams to compete in a tournament. After each round, half of the teams were eliminated. Which equation represents the number of teams, t, that remained in the tournament after r rounds?
   1   $t = 64(r)^{0.5}$
   2   $t = 64(-0.5)^r$
   3   $t = 64(1.5)^r$
   4   $t = 64(0.5)^r$

554 A bank is advertising that new customers can open a savings account with a $3\frac{3}{4}$ % interest rate compounded annually. Robert invests $5,000 in an account at this rate. If he makes no additional deposits or withdrawals on his account, find the amount of money he will have, to the *nearest cent*, after three years.

555 Cassandra bought an antique dresser for $500. If the value of her dresser increases 6% annually, what will be the value of Cassandra's dresser at the end of 3 years to the *nearest dollar*?
1 $415
2 $590
3 $596
4 $770

556 In a science fiction novel, the main character found a mysterious rock that decreased in size each day. The table below shows the part of the rock that remained at noon on successive days.

Day	Fractional Part of the Rock Remaining
1	1
2	$\frac{1}{2}$
3	$\frac{1}{4}$
4	$\frac{1}{8}$

Which fractional part of the rock will remain at noon on day 7?

1 $\frac{1}{128}$

2 $\frac{1}{64}$

3 $\frac{1}{14}$

4 $\frac{1}{12}$

557 The value, y, of a $15,000 investment over x years

is represented by the equation $y = 15000(1.2)^{\frac{x}{3}}$.
What is the profit (interest) on a 6-year investment?
1 $6,600
2 $10,799
3 $21,600
4 $25,799

558 The Booster Club raised $30,000 for a sports fund. No more money will be placed into the fund. Each year the fund will decrease by 5%. Determine the amount of money, to the *nearest cent*, that will be left in the sports fund after 4 years.

559 The value of a car purchased for $20,000 decreases at a rate of 12% per year. What will be the value of the car after 3 years?
1 $12,800.00
2 $13,629.44
3 $17,600.00
4 $28,098.56

560 The current student population of the Brentwood Student Center is 2,000. The enrollment at the center increases at a rate of 4% each year. To the *nearest whole number*, what will the student population be closest to in 3 years'?
1 2,240
2 2,250
3 5,488
4 6,240

561 Mr. Smith invested $2,500 in a savings account that earns 3% interest compounded annually. He made no additional deposits or withdrawals. Which expression can be used to determine the number of dollars in this account at the end of 4 years?
1 $2500(1 + 0.03)^4$
2 $2500(1 + 0.3)^4$
3 $2500(1 + 0.04)^3$
4 $2500(1 + 0.4)^3$

562 A car depreciates (loses value) at a rate of 4.5% annually. Greg purchased a car for $12,500. Which equation can be used to determine the value of the car, V, after 5 years?
1 $V = 12,500(0.55)^5$
2 $V = 12,500(0.955)^5$
3 $V = 12,500(1.045)^5$
4 $V = 12,500(1.45)^5$

563 Is the equation $A = 21000(1 - 0.12)^t$ a model of exponential growth or exponential decay, and what is the rate (percent) of change per time period?
1   exponential growth and 12%
2   exponential growth and 88%
3   exponential decay and 12%
4   exponential decay and 88%

564 The current population of a town is 10,000. If the population, P, increases by 20% each year, which equation could be used to find the population after t years?
1    $P = 10,000(0.2)^t$
2    $P = 10,000(0.8)^t$
3    $P = 10,000(1.2)^t$
4    $P = 10,000(1.8)^t$

565 Adrianne invested $2000 in an account at a 3.5% interest rate compounded annually. She made no deposits or withdrawals on the account for 4 years. Determine, to the *nearest dollar*, the balance in the account after the 4 years.

566 Kirsten invested $1000 in an account at an annual interest rate of 3%. She made no deposits or withdrawals on the account for 5 years. The interest was compounded annually. Find the balance in the account, to the *nearest cent*, at the end of 5 years.

A.G.4: GRAPHING EXPONENTIAL FUNCTIONS

567 On the set of axes below, draw the graph of $y = 2^x$ over the interval $-1 \le x \le 3$. Will this graph ever intersect the *x*-axis? Justify your answer.
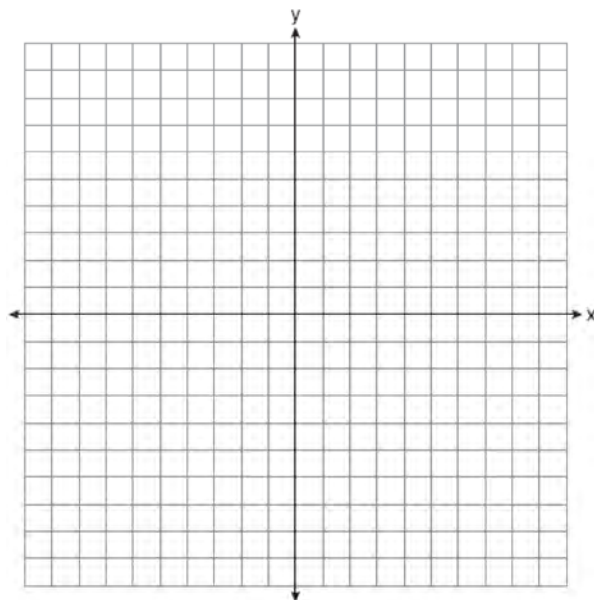
568 On the set of axes below, graph $y = 3^x$ over the interval $-1 \le x \le 2$.
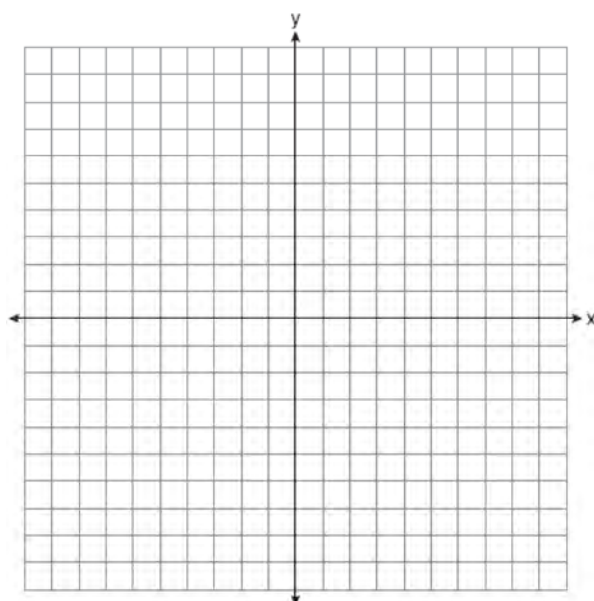
569 Which graph represents the exponential decay of a radioactive element?

1

2

3

4
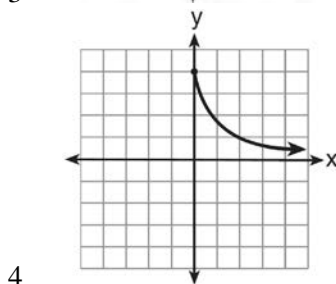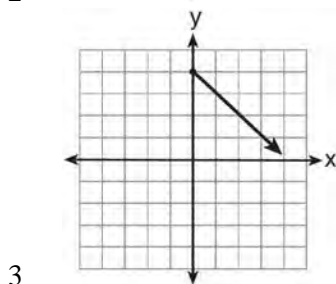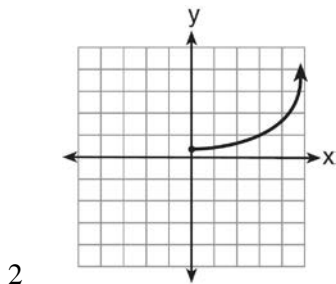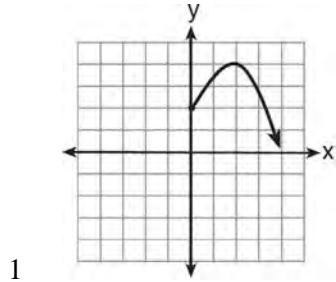
RADICALS
A.N.2: SIMPLIFYING RADICALS

570 Express $5\sqrt{72}$ in simplest radical form.

571 What is $\dfrac{\sqrt{32}}{4}$ expressed in simplest radical form?

1 $\sqrt{2}$
2 $4\sqrt{2}$
3 $\sqrt{8}$
4 $\dfrac{\sqrt{8}}{2}$

572 What is $\sqrt{72}$ expressed in simplest radical form?

1 $2\sqrt{18}$
2 $3\sqrt{8}$
3 $6\sqrt{2}$
4 $8\sqrt{3}$

573 What is $\sqrt{32}$ expressed in simplest radical form?

1 $16\sqrt{2}$
2 $4\sqrt{2}$
3 $4\sqrt{8}$
4 $2\sqrt{8}$

574 When $5\sqrt{20}$ is written in simplest radical form, the result is $k\sqrt{5}$. What is the value of k?

1 20
2 10
3 7
4 4

575 Express $-3\sqrt{48}$ in simplest radical form.

576 What is $3\sqrt{250}$ expressed in simplest radical form?

1 $5\sqrt{10}$
2 $8\sqrt{10}$
3 $15\sqrt{10}$
4 $75\sqrt{10}$

577 What is $2\sqrt{45}$ expressed in simplest radical form?

1 $3\sqrt{5}$
2 $5\sqrt{5}$
3 $6\sqrt{5}$
4 $18\sqrt{5}$

578 Express $4\sqrt{75}$ in simplest radical form.

579 Express $2\sqrt{108}$ in simplest radical form.

A.N.3: OPERATIONS WITH RADICALS

580 Express the product of $3\sqrt{20}(2\sqrt{5}-7)$ in simplest radical form.

581 The expression $6\sqrt{50}+6\sqrt{2}$ written in simplest radical form is

1 $6\sqrt{52}$
2 $12\sqrt{52}$
3 $17\sqrt{2}$
4 $36\sqrt{2}$

582 The expression $\sqrt{72}-3\sqrt{2}$ written in simplest radical form is

1 $5\sqrt{2}$
2 $3\sqrt{6}$
3 $3\sqrt{2}$
4 $\sqrt{6}$

583 What is $3\sqrt{2}+\sqrt{8}$ expressed in simplest radical form?

1 $3\sqrt{10}$
2 $3\sqrt{16}$
3 $5\sqrt{2}$
4 $7\sqrt{2}$

584 Express $\dfrac{16\sqrt{21}}{2\sqrt{7}}-5\sqrt{12}$ in simplest radical form.

585 Express $\dfrac{3\sqrt{75}+\sqrt{27}}{3}$ in simplest radical form.

586 Express $\sqrt{25}-2\sqrt{3}+\sqrt{27}+2\sqrt{9}$ in simplest radical form.

587 Express $\dfrac{\sqrt{84}}{2\sqrt{3}}$ in simplest radical form.

RATIONALS
A.A.16: RATIONAL EXPRESSIONS

588 The expression $\dfrac{9x^4-27x^6}{3x^3}$ is equivalent to

1 $3x(1-3x)$
2 $3x(1-3x^2)$
3 $3x(1-9x^5)$
4 $9x^3(1-x)$

589 Which expression represents $\dfrac{2x^2-12x}{x-6}$ in simplest form?

1 0
2 $2x$
3 $4x$
4 $2x+2$

590 Which expression represents $\dfrac{25x-125}{x^2-25}$ in simplest form?

1 $\dfrac{5}{x}$
2 $\dfrac{-5}{x}$
3 $\dfrac{25}{x-5}$
4 $\dfrac{25}{x+5}$

591 Which expression represents $\dfrac{x^2 - 2x - 15}{x^2 + 3x}$ in simplest form?

1 -5

2 $\dfrac{x-5}{x}$

3 $\dfrac{-2x-5}{x}$

4 $\dfrac{-2x-15}{3x}$

592 Which expression represents $\dfrac{x^2 - x - 6}{x^2 - 5x + 6}$ in simplest form?

1 $\dfrac{x+2}{x-2}$

2 $\dfrac{-x-6}{-5x+6}$

3 $\dfrac{1}{5}$

4 -1

593 The area of a rectangle is represented by $x^2 - 5x - 24$. If the width of the rectangle is represented by $x - 8$, express the length of the rectangle as a binomial.

594 Express in simplest form: $\dfrac{x^2 - 1}{x^2 + 3x + 2}$

595 Which expression represents $\dfrac{x^2 - 3x - 10}{x^2 - 25}$ in simplest form?

1 $\dfrac{2}{5}$

2 $\dfrac{x+2}{x+5}$

3 $\dfrac{x-2}{x-5}$

4 $\dfrac{-3x-10}{-25}$

596 Which expression is equivalent to $\dfrac{2x^6 - 18x^4 + 2x^2}{2x^2}$?

1 $x^3 - 9x^2$

2 $x^4 - 9x^2$

3 $x^3 - 9x^2 + 1^`$

4 $x^4 - 9x^2 + 1$

597 The expression $\dfrac{2x^2 + 10x - 28}{4x + 28}$ is equivalent to

1 $\dfrac{x-2}{2}$

2 $x - 1$

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

4 $\dfrac{x+5}{2}$

598 If the area of a rectangle is represented by $x^2 + 8x + 15$ and its length is represented by $x + 5$, which expression represents the width of the rectangle?

1 $x + 3$

2 $x - 3$

3 $x^2 + 6x + 5$

4 $x^2 + 7x + 10$

599 Which fraction represents $\dfrac{x^2 - 25}{x^2 - x - 20}$ expressed in simplest form?

1 $\dfrac{5}{4}$

2 $\dfrac{x-5}{x-4}$

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

4 $\dfrac{25}{x+20}$

<u>A.A.15: UNDEFINED RATIONALS</u>

600 For which value of x is $\frac{x-3}{x^2-4}$ undefined?

1   −2
2   0
3   3
4   4

601 Which value of x makes the expression $\frac{x+4}{x-3}$ undefined?

1   −4
2   −3
3   3
4   0

602 The function $y = \frac{x}{x^2-9}$ is undefined when the value of x is

1   0 or 3
2   3 or −3
3   3, only
4   −3, only

603 Which value of n makes the expression $\frac{5n}{2n-1}$ undefined?

1   1
2   0
3   $-\frac{1}{2}$
4   $\frac{1}{2}$

604 Which value of x makes the expression

$\frac{x^2-9}{x^2+7x+10}$ undefined?

1   −5
2   2
3   3
4   −3

605 The algebraic expression $\frac{x-2}{x^2-9}$ is undefined when x is

1   0
2   2
3   3
4   9

606 For which set of values of x is the algebraic

expression $\frac{x^2-16}{x^2-4x-12}$ undefined?

1   $\{-6, 2\}$
2   $\{-4, 3\}$
3   $\{-4, 4\}$
4   $\{-2, 6\}$

607 For which values of x is the fraction $\frac{x^2+x-6}{x^2+5x-6}$ undefined?

1   1 and −6
2   2 and −3
3   3 and −2
4   6 and −1

608 The expression $\frac{14+x}{x^2-4}$ is undefined when x is

1   −14, only
2   2, only
3   −2 or 2
4   −14, −2, or 2

609 The expression $\frac{x-3}{x+2}$ is undefined when the value of x is

1   −2, only
2   −2 and 3
3   3, only
4   −3 and 2

610 A value of x that makes the expression

$\dfrac{x^2 + 4x - 12}{x^2 - 2x - 15}$ undefined is

1   −6
2   −2
3   3
4   5

A.A.18: MULTIPLICATION AND DIVISION OF RATIONALS

611 What is the product of $\dfrac{x^2 - 1}{x + 1}$ and $\dfrac{x + 3}{3x - 3}$ expressed in simplest form?

1   x

2   $\dfrac{x}{3}$

3   $x + 3$

4   $\dfrac{x + 3}{3}$

612 What is the product of $\dfrac{4x}{x - 1}$ and $\dfrac{x^2 - 1}{3x + 3}$ expressed in simplest form?

1   $\dfrac{4x}{3}$

2   $\dfrac{4x^2}{3}$

3   $\dfrac{4x^2}{3(x + 1)}$

4   $\dfrac{4(x + 1)}{3}$

613 Perform the indicated operation and simplify:

$\dfrac{3x + 6}{4x + 12} \div \dfrac{x^2 - 4}{x + 3}$

614 Express in simplest form: $\dfrac{2x^2 - 8x - 42}{6x^2} \div \dfrac{x^2 - 9}{x^2 - 3x}$

615 Express in simplest form:

$\dfrac{x^2 + 9x + 14}{x^2 - 49} \div \dfrac{3x + 6}{x^2 + x - 56}$

616 What is the quotient of $\dfrac{x}{x + 4}$ divided by $\dfrac{2x}{x^2 - 16}$?

1   $\dfrac{2}{x - 4}$

2   $\dfrac{2x^2}{x - 4}$

3   $\dfrac{2x^2}{x^2 - 16}$

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

617 Express the product of $\dfrac{x + 2}{2}$ and $\dfrac{4x + 20}{x^2 + 6x + 8}$ in simplest form.

618 Express $\dfrac{3x^2 + 9x}{x^2 + 5x + 6} \div \dfrac{x^2 - 9}{x^2 - x - 6}$ in simplest form.

A.A.17: ADDITION AND SUBTRACTION OF RATIONALS

619 What is the sum of $\dfrac{d}{2}$ and $\dfrac{2d}{3}$ expressed in simplest form?

1   $\dfrac{3d}{5}$

2   $\dfrac{3d}{6}$

3   $\dfrac{7d}{5}$

4   $\dfrac{7d}{6}$

620 What is $\dfrac{6}{5x} - \dfrac{2}{3x}$ in simplest form?

1   $\dfrac{8}{15x^2}$

2   $\dfrac{8}{15x}$

3   $\dfrac{4}{15x}$

4   $\dfrac{4}{2x}$

621 What is $\dfrac{6}{4a} - \dfrac{2}{3a}$ expressed in simplest form?

1   $\dfrac{4}{a}$

2   $\dfrac{5}{6a}$

3   $\dfrac{8}{7a}$

4   $\dfrac{10}{12a}$

622 What is the sum of $\dfrac{3}{2x}$ and $\dfrac{4}{3x}$ expressed in simplest form?

1   $\dfrac{12}{6x^2}$

2   $\dfrac{17}{6x}$

3   $\dfrac{7}{5x}$

4   $\dfrac{17}{12x}$

623 What is the sum of $\dfrac{3x^2}{x-2}$ and $\dfrac{x^2}{x-2}$?

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

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

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

4   $\dfrac{4x^2}{x-2}$

624 What is the sum of $\dfrac{-x+7}{2x+4}$ and $\dfrac{2x+5}{2x+4}$?

1   $\dfrac{x+12}{2x+4}$

2   $\dfrac{3x+12}{2x+4}$

3   $\dfrac{x+12}{4x+8}$

4   $\dfrac{3x+12}{4x+8}$

625 What is $\dfrac{2+x}{5x} - \dfrac{x-2}{5x}$ expressed in simplest form?

1   0

2   $\dfrac{2}{5}$

3   $\dfrac{4}{5x}$

4   $\dfrac{2x+4}{5x}$

626 What is the sum of $\dfrac{3}{2x}$ and $\dfrac{7}{4x}$?

1   $\dfrac{21}{8x^2}$

2   $\dfrac{13}{4x}$

3   $\dfrac{10}{6x}$

4   $\dfrac{13}{8x}$

627 What is $\dfrac{7}{12x} - \dfrac{y}{6x^2}$ expressed in simplest form?

1   $\dfrac{7-y}{6x}$

2   $\dfrac{7-y}{12x-6x^2}$

3   $-\dfrac{7y}{12x^2}$

4   $\dfrac{7x-2y}{12x^2}$

628 What is the sum of $\frac{2y}{y+5}$ and $\frac{10}{y+5}$ expressed in simplest form?

1 1

2 2

3 $\frac{12y}{y+5}$

4 $\frac{2y+10}{y+5}$

629 The expression $\frac{2x+13}{2x+6} - \frac{3x-6}{2x+6}$ is equivalent to

1 $\frac{-x+19}{2(x+3)}$

2 $\frac{-x+7}{2(x+3)}$

3 $\frac{5x+19}{2(x+3)}$

4 $\frac{5x+7}{4x+12}$

630 Which fraction is equivalent to $\frac{4}{3a} - \frac{5}{2a}$?

1 $-\frac{1}{a}$

2 $-\frac{1}{5a}$

3 $-\frac{7}{6a}$

4 $-\frac{7}{6a^2}$

631 The expression $\frac{2n}{5} + \frac{3n}{2}$ is equivalent to

1 $\frac{5n}{7}$

2 $\frac{6n^2}{10}$

3 $\frac{19n}{10}$

4 $\frac{7n}{10}$

A.A.26: SOLVING RATIONALS

632 Solve for x: $\frac{x+1}{x} = \frac{-7}{x-12}$

633 Which value of x is a solution of $\frac{5}{x} = \frac{x+13}{6}$?

1 −2

2 −3

3 −10

4 −15

634 What is the solution of $\frac{k+4}{2} = \frac{k+9}{3}$?

1 1

2 5

3 6

4 14

635 What is the value of x in the equation $\frac{2}{x} - 3 = \frac{26}{x}$?

1 −8

2 $-\frac{1}{8}$

3 $\frac{1}{8}$

4 8

636 What is the solution set of $\frac{x+2}{x-2} = \frac{-3}{x}$?

1 {−2, 3}

2 {−3, −2}

3 {−1, 6}

4 {−6, 1}

637 Which value of x is the solution of $\frac{2x-3}{x-4} = \frac{2}{3}$?

1 $-\frac{1}{4}$

2 $\frac{1}{4}$

3 −4

4 4

638 Solve algebraically for x: $\dfrac{x+2}{6} = \dfrac{3}{x-1}$

639 Solve algebraically for x: $\dfrac{3}{4} = \dfrac{-(x+11)}{4x} + \dfrac{1}{2x}$

640 What is the solution of $\dfrac{2}{x+1} = \dfrac{x+1}{2}$?

   1   -1 and -3
   2   -1 and 3
   3   1 and -3
   4   1 and 3

641 What is the solution of the equation $\dfrac{x+2}{2} = \dfrac{4}{x}$?

   1   1 and -8
   2   2 and -4
   3   -1 and 8
   4   -2 and 4

642 Solve algebraically: $\dfrac{2}{3x} + \dfrac{4}{x} = \dfrac{7}{x+1}$

[Only an algebraic solution can receive full credit.]

643 Solve algebraically for all values of x:

$$\dfrac{3}{x+5} = \dfrac{2x}{x^2 - 8}$$

FUNCTIONS

A.G.4: FAMILIES OF FUNCTIONS

644 Which type of graph is shown in the diagram below?
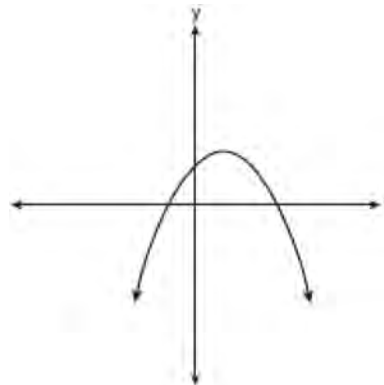
   1   absolute value
   2   exponential
   3   linear
   4   quadratic

645 Which graph represents a linear function?

1

2

3

4
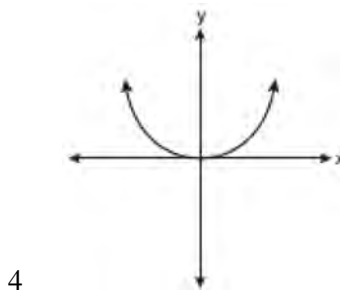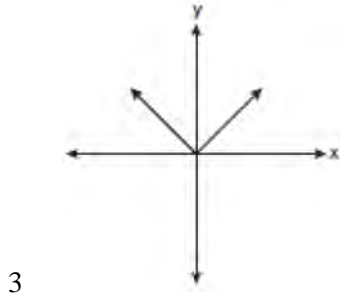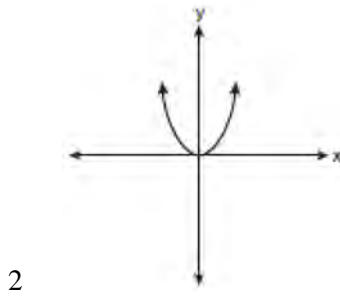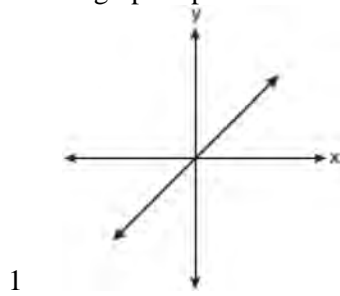
646 Antwaan leaves a cup of hot chocolate on the counter in his kitchen. Which graph is the best representation of the change in temperature of his hot chocolate over time?

1

2

3

4
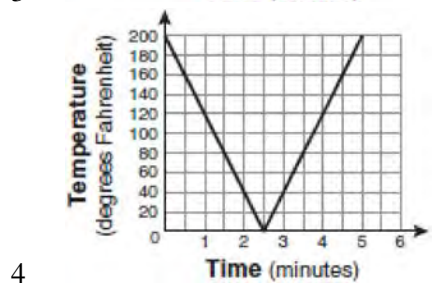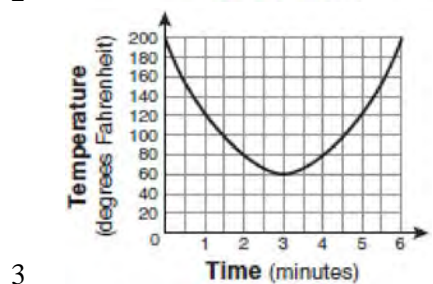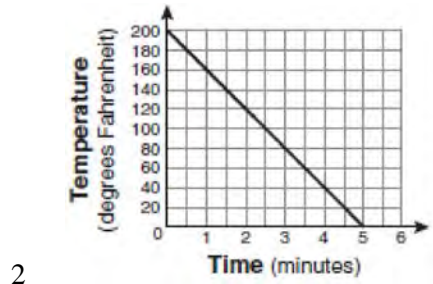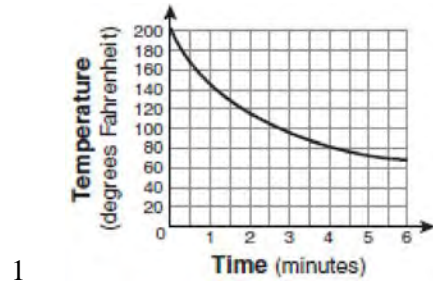
647 Which graph represents an exponential equation?

1

2

3

4
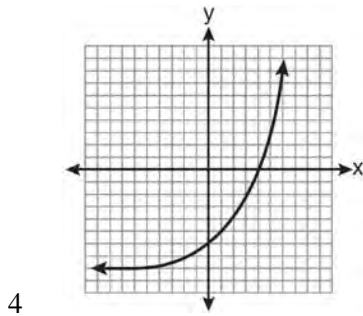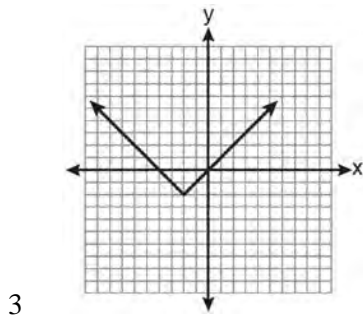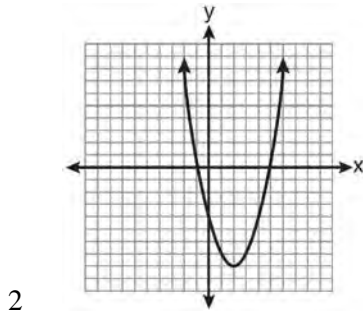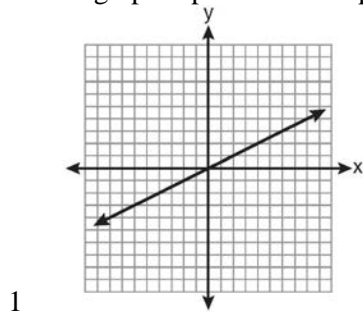
648 Which type of function is represented by the graph shown below?
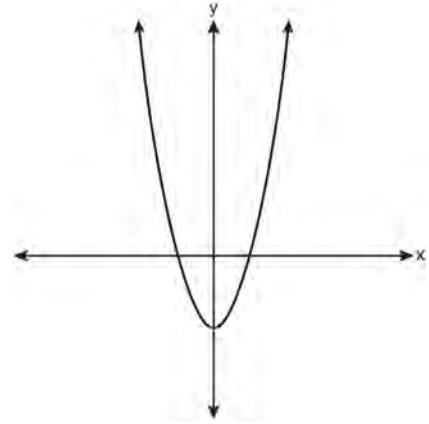
1   absolute value
2   exponential
3   linear
4   quadratic

649 Which equation represents a quadratic function?
1     $y = x + 2$
2     $y = |x + 2|$
3     $y = x^2$
4     $y = 2^x$

650 Which type of function is graphed below?
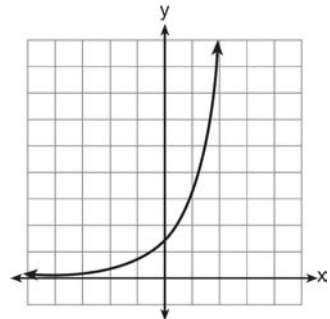
1   linear
2   quadratic
3   exponential
4   absolute value

A.G.4: IDENTIFYING THE EQUATION OF A GRAPH

651 Which equation is represented by the graph below?
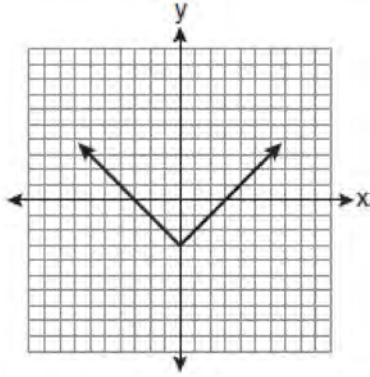
1 $y = x^2 - 3$
2 $y = (x - 3)^2$
3 $y = |x| - 3$
4 $y = |x - 3|$

652 Which equation is represented by the graph below?
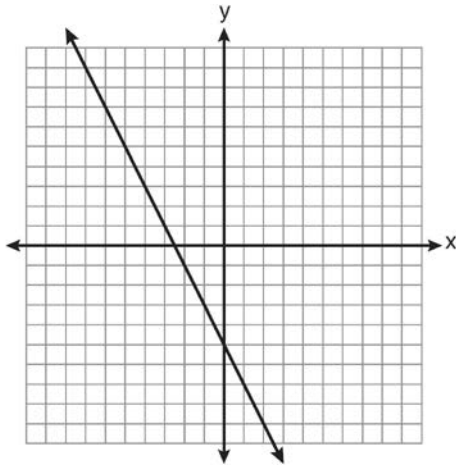
1 $2y + x = 10$
2 $y - 2x = -5$
3 $-2y = 10x - 4$
4 $2y = -4x - 10$

A.G.3: DEFINING FUNCTIONS

653 Which graph represents a function?

1

2

3

4
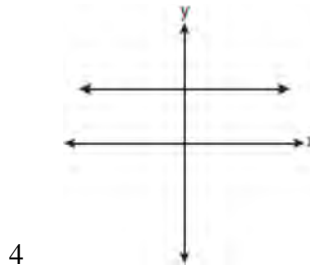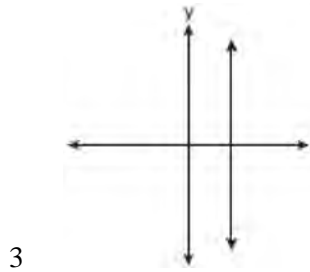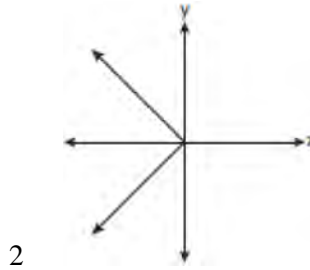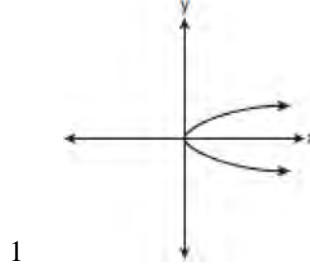
654 Which graph represents a function?

1

2

3

4
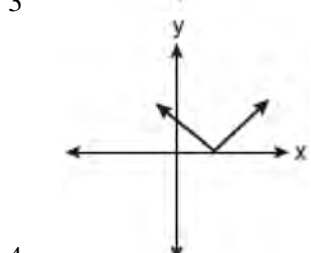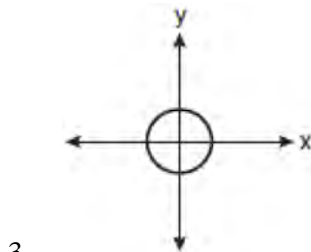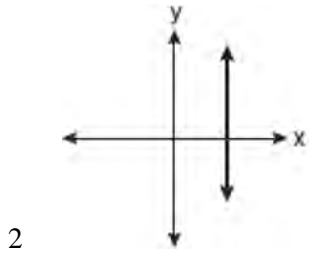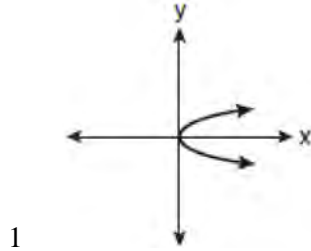
655 Which statement is true about the relation shown on the graph below?
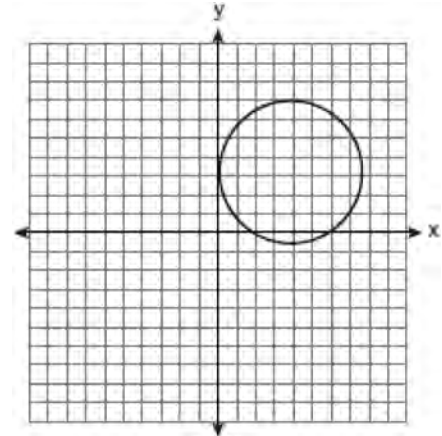
1 It is a function because there exists one x-coordinate for each y-coordinate.
2 It is a function because there exists one y-coordinate for each x-coordinate.
3 It is *not* a function because there are multiple y-values for a given x-value.
4 It is *not* a function because there are multiple x-values for a given y-value.

656 Which relation is *not* a function?
1 $\{(1,5),(2,6),(3,6),(4,7)\}$
2 $\{(4,7),(2,1),(-3,6),(3,4)\}$
3 $\{(-1,6),(1,3),(2,5),(1,7)\}$
4 $\{(-1,2),(0,5),(5,0),(2,-1)\}$

657 Which relation represents a function?
1 $\{(0,3),(2,4),(0,6)\}$
2 $\{(-7,5),(-7,1),(-10,3),(-4,3)\}$
3 $\{(2,0),(6,2),(6,-2)\}$
4 $\{(-6,5),(-3,2),(1,2),(6,5)\}$

658 Which graph represents a function?

1

2

3

4
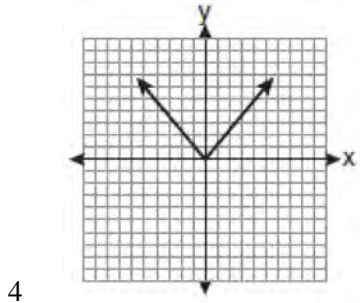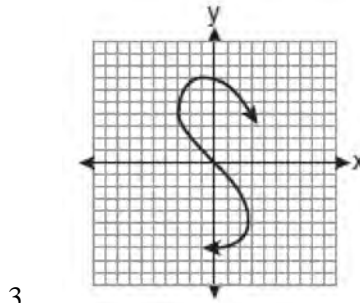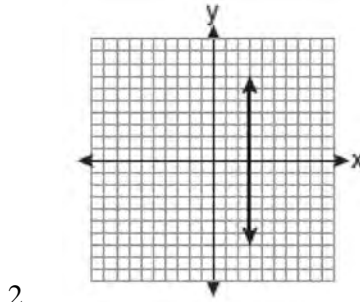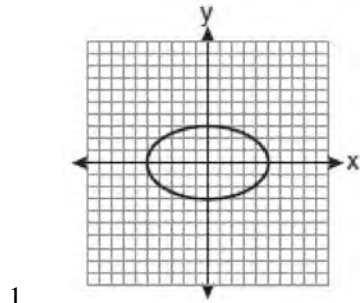
659 Which relation is a function?

1 $\left\{ \left(\frac{3}{4} , 0 \right), (0,1), \left(\frac{3}{4} , 2 \right) \right\}$

2 $\left\{ (-2,2), \left(-\frac{1}{2} , 1 \right), (-2,4) \right\}$

3 $\{ (-1,4), (0,5), (0,4) \}$

4 $\{ (2,1), (4,3), (6,5) \}$

660 Which set of ordered pairs represents a function?

1 $\{ (0,4), (2,4), (2,5) \}$

2 $\{ (6,0), (5,0), (4,0) \}$

3 $\{ (4,1), (6,2), (6,3), (5,0) \}$

4 $\{ (0,4), (1,4), (0,5), (1,5) \}$

661 Which graph does *not* represent a function?

1

2

3

4
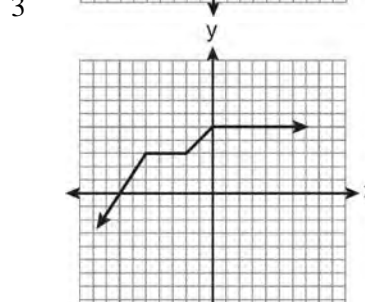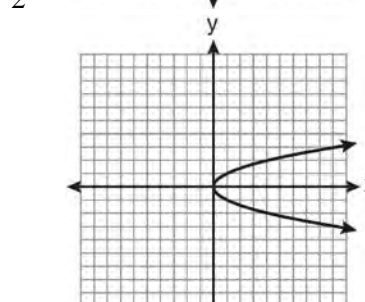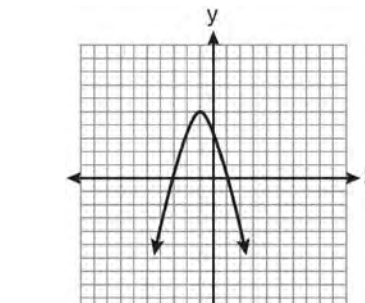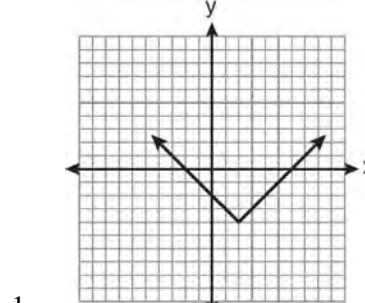
662 Which graph represents a function?

1

2

3

4
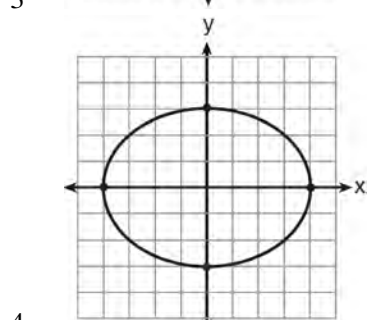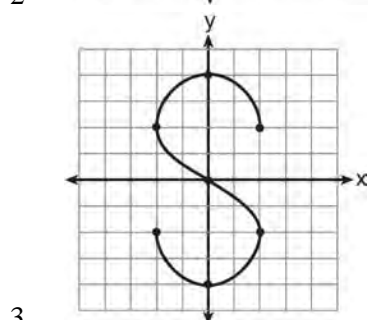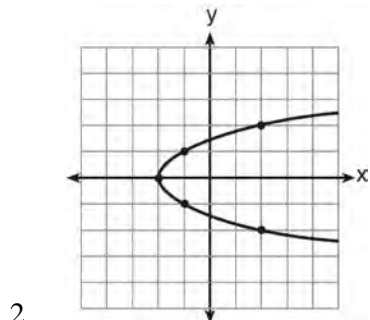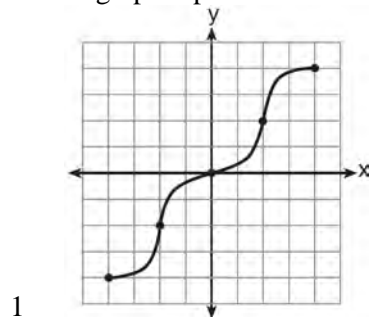
663 Which graph represents a function?

1

2

3

4
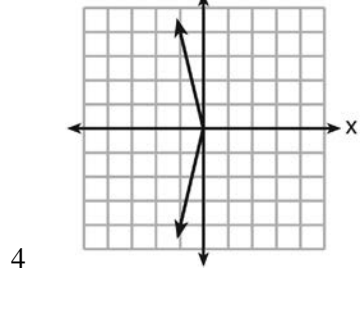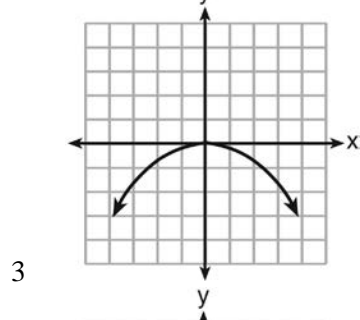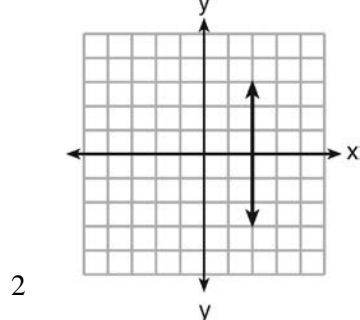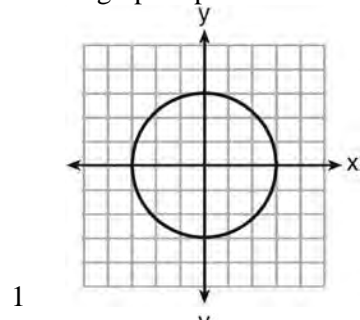
664 Which graph does *not* represent the graph of a function?

1

2

3

4
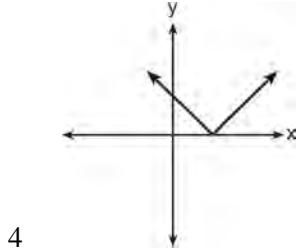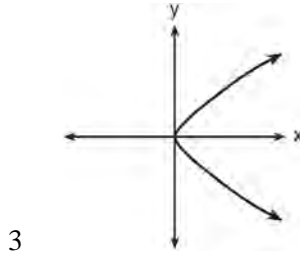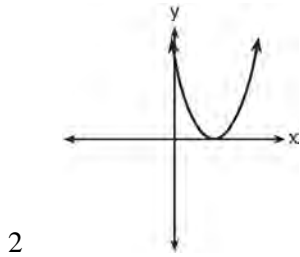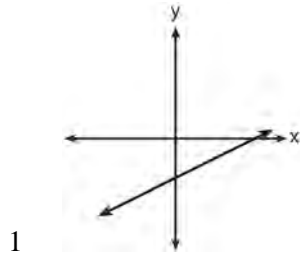
665 Which relation is *not* a function?

1 $\{(2,4),(1,2),(0,0),(-1,2),(-2,4)\}$
2 $\{(2,4),(1,1),(0,0),(-1,1),(-2,4)\}$
3 $\{(2,2),(1,1),(0,0),(-1,1),(-2,2)\}$
4 $\{(2,2),(1,1),(0,0),(1,-1),(2,-2)\}$

TRIANGLES
A.A.45: PYTHAGOREAN THEOREM

666 Tanya runs diagonally across a rectangular field that has a length of 40 yards and a width of 30 yards, as shown in the diagram below.
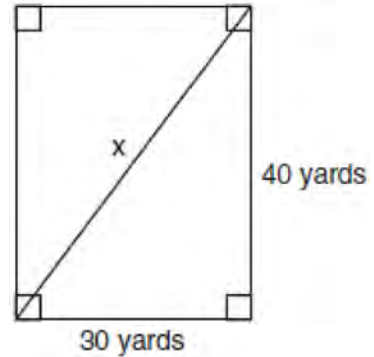
What is the length of the diagonal, in yards, that Tanya runs?

1 50
2 60
3 70
4 80

667 Don placed a ladder against the side of his house as shown in the diagram below.
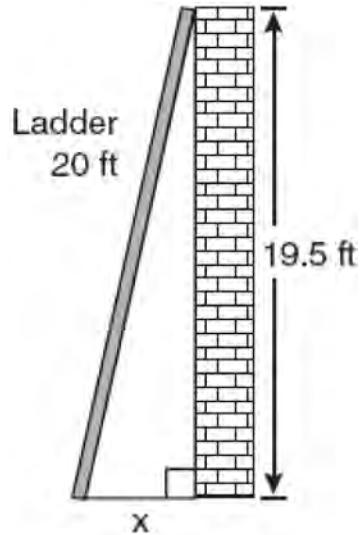
Which equation could be used to find the distance, x, from the foot of the ladder to the base of the house?

1   $x = 20 - 19.5$

2   $x = 20^2 - 19.5^2$

3   $x = \sqrt{20^2 - 19.5^2}$

4   $x = \sqrt{20^2 + 19.5^2}$

668 The length of the hypotenuse of a right triangle is 34 inches and the length of one of its legs is 16 inches. What is the length, in inches, of the other leg of this right triangle?

1   16

2   18

3   25

4   30

669 What is the value of x, in inches, in the right triangle below?
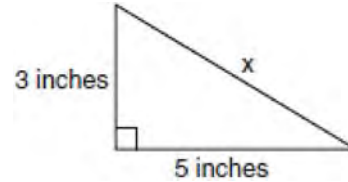
1   $\sqrt{15}$

2   8

3   $\sqrt{34}$

4   4

670 Nancy's rectangular garden is represented in the diagram below.
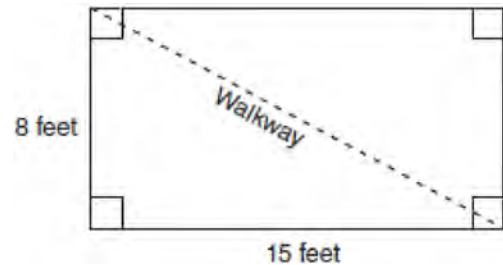
If a diagonal walkway crosses her garden, what is its length, in feet?

1   17

2   22

3   $\sqrt{161}$

4   $\sqrt{529}$

671 The end of a dog's leash is attached to the top of a 5-foot-tall fence post, as shown in the diagram below. The dog is 7 feet away from the base of the fence post.
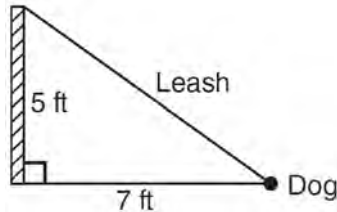
How long is the leash, to the *nearest tenth of a foot*?
1 4.9
2 8.6
3 9.0
4 12.0

672 The rectangle shown below has a diagonal of 18.4 cm and a width of 7 cm.
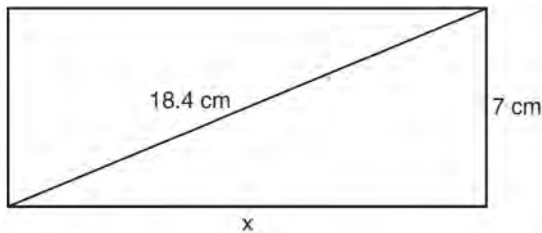
To the *nearest centimeter*, what is the length, *x*, of the rectangle?
1 11
2 17
3 20
4 25

673 The legs of an isosceles right triangle each measure 10 inches. What is the length of the hypotenuse of this triangle, to the *nearest tenth of an inch*?
1 6.3
2 7.1
3 14.1
4 17.1

674 Campsite *A* and campsite *B* are located directly opposite each other on the shores of Lake Omega, as shown in the diagram below. The two campsites form a right triangle with Sam's position, *S*. The distance from campsite *B* to Sam's position is 1,300 yards, and campsite *A* is 1,700 yards from his position.
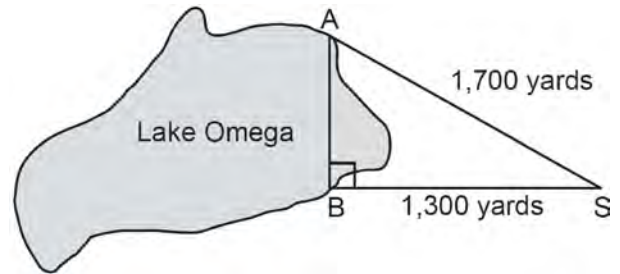
What is the distance from campsite *A* to campsite *B*, to the *nearest yard*?
1 1,095
2 1,096
3 2,140
4 2,141

675 The length of one side of a square is 13 feet. What is the length, to the *nearest foot*, of a diagonal of the square?
1 13
2 18
3 19
4 26

676 In triangle *RST*, angle *R* is a right angle. If $TR = 6$ and $TS = 8$, what is the length of $\overline{RS}$?
1 10
2 2
3 $2\sqrt{7}$
4 $7\sqrt{2}$

677 In right triangle *ABC*, m$\angle C = 90$, $AC = 7$, and $AB = 13$. What is the length of $\overline{BC}$?
1 6
2 20
3 $\sqrt{120}$
4 $\sqrt{218}$

678 The length and width of a rectangle are 48 inches and 40 inches. To the *nearest inch*, what is the length of its diagonal?
1   27
2   62
3   88
4   90

TRIGONOMETRY

A.A.42: TRIGONOMETRIC RATIOS

679 In triangle *MCT*, the measure of $\angle T = 90°$, *MC* = 85 cm, *CT* = 84 cm, and *TM* = 13cm. Which ratio represents the sine of $\angle C$?
1   $\dfrac{13}{85}$

2   $\dfrac{84}{85}$

3   $\dfrac{13}{84}$

4   $\dfrac{84}{13}$

680 The diagram below shows right triangle *UPC*.
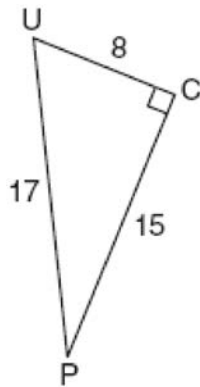
Which ratio represents the sine of $\angle U$?
1   $\dfrac{15}{8}$

2   $\dfrac{15}{17}$

3   $\dfrac{8}{15}$

4   $\dfrac{8}{17}$

681 Which equation shows a correct trigonometric ratio for angle *A* in the right triangle below?
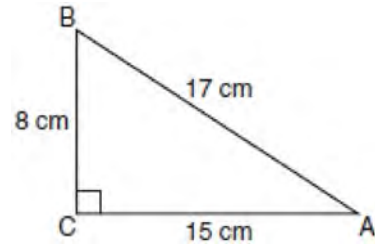
1   $\sin A = \dfrac{15}{17}$

2   $\tan A = \dfrac{8}{17}$

3   $\cos A = \dfrac{15}{17}$

4   $\tan A = \dfrac{5}{8}$

682 In $\triangle ABC$, the measure of $\angle B = 90°$, *AC* = 50, *AB* = 48, and *BC* = 14. Which ratio represents the tangent of $\angle A$?
1   $\dfrac{14}{50}$

2   $\dfrac{14}{48}$

3   $\dfrac{48}{50}$

4   $\dfrac{48}{14}$

683 Right triangle *ABC* has legs of 8 and 15 and a hypotenuse of 17, as shown in the diagram below.
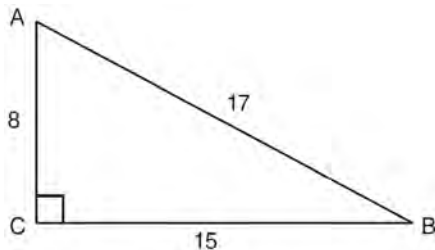
The value of the tangent of ∠*B* is
1 0.4706
2 0.5333
3 0.8824
4 1.8750

684 Which ratio represents sin *x* in the right triangle shown below?
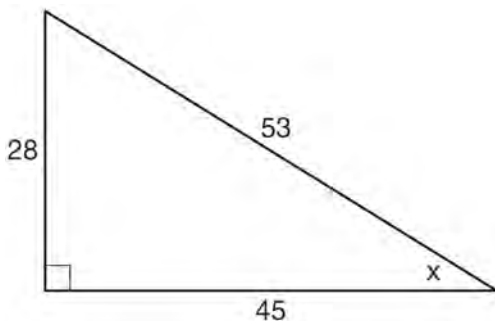
1 $\frac{28}{53}$

2 $\frac{28}{45}$

3 $\frac{45}{53}$

4 $\frac{53}{28}$

685 The diagram below shows right triangle *ABC*.
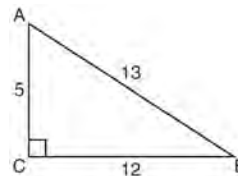
Which ratio represents the tangent of ∠*ABC*?

1 $\frac{5}{13}$

2 $\frac{5}{12}$

3 $\frac{12}{13}$

4 $\frac{12}{5}$

686 The diagram below shows right triangle *LMP*.
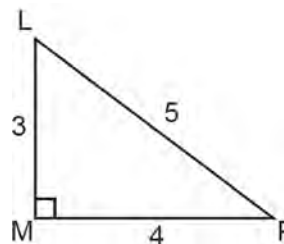
Which ratio represents the tangent of ∠*PLM*?

1 $\frac{3}{4}$

2 $\frac{3}{5}$

3 $\frac{4}{3}$

4 $\frac{5}{4}$

114

687 In $\triangle ABC$, $m\angle C = 90$. If $AB = 5$ and $AC = 4$, which statement is *not* true?

1 $\cos A = \dfrac{4}{5}$

2 $\tan A = \dfrac{3}{4}$

3 $\sin B = \dfrac{4}{5}$

4 $\tan B = \dfrac{5}{3}$

688 In right triangle ABC shown below, what is the value of $\cos A$?
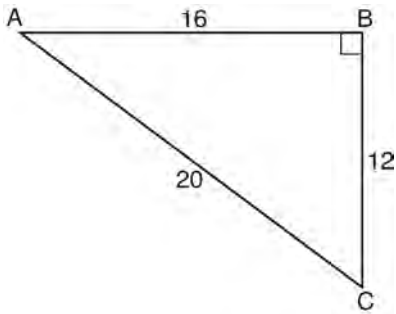
1 $\dfrac{12}{20}$

2 $\dfrac{16}{20}$

3 $\dfrac{20}{12}$

4 $\dfrac{20}{16}$

689 Which ratio represents the cosine of angle A in the right triangle below?
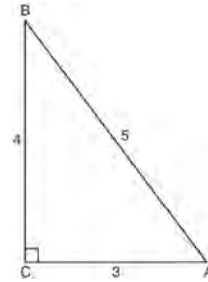
1 $\dfrac{3}{5}$

2 $\dfrac{5}{3}$

3 $\dfrac{4}{5}$

4 $\dfrac{4}{3}$

A.A.44: USING TRIGONOMETRY TO FIND A SIDE

690 In the right triangle shown in the diagram below, what is the value of x to the *nearest whole number*?
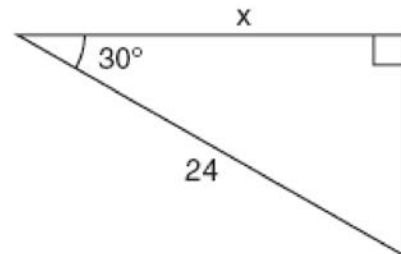
1 12
2 14
3 21
4 28

691 A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of 52°.
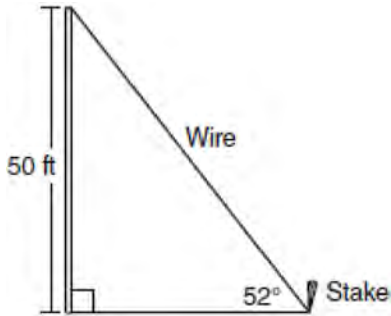
How far away from the base of the pole should the stake be driven in, to the *nearest foot*? What will be the length of the wire from the stake to the top of the pole, to the *nearest foot*?

692 A tree casts a 25-foot shadow on a sunny day, as shown in the diagram below.
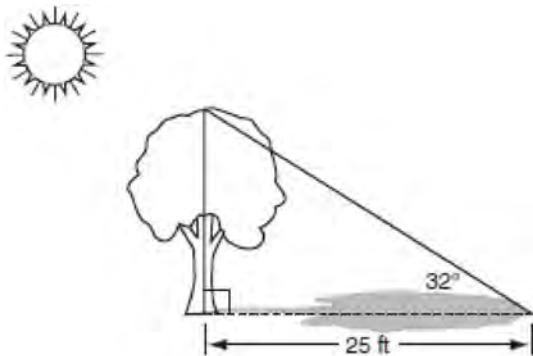
If the angle of elevation from the tip of the shadow to the top of the tree is 32°, what is the height of the tree to the *nearest tenth of a foot*?
1   13.2
2   15.6
3   21.2
4   40.0

693 A hot-air balloon is tied to the ground with two taut (straight) ropes, as shown in the diagram below. One rope is directly under the balloon and makes a right angle with the ground. The other rope forms an angle of 50° with the ground.
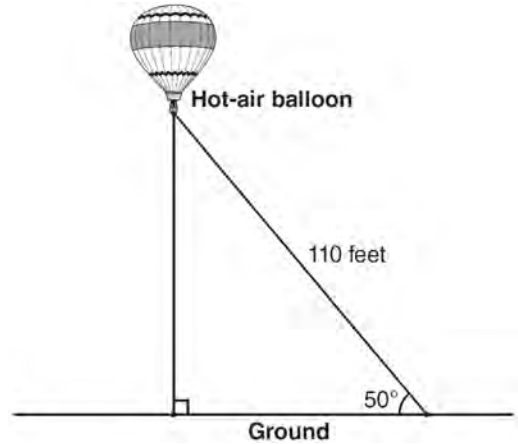
Determine the height, to the *nearest foot,* of the balloon directly above the ground. Determine the distance, to the *nearest foot,* on the ground between the two ropes.

694 As shown in the diagram below, a ladder 5 feet long leans against a wall and makes an angle of 65° with the ground. Find, to the *nearest tenth of a foot*, the distance from the wall to the base of the ladder.
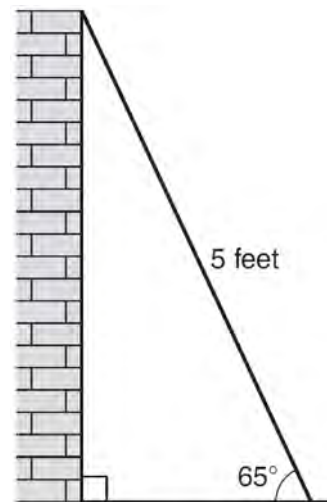
695 An 8-foot rope is tied from the top of a pole to a stake in the ground, as shown in the diagram below.
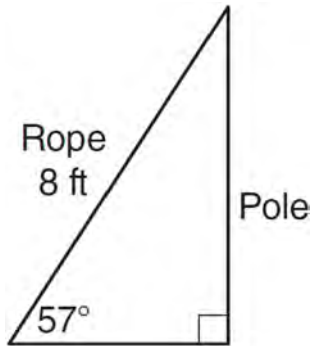
If the rope forms a 57° angle with the ground, what is the height of the pole, to the *nearest tenth of a foot*?
1   4.4
2   6.7
3   9.5
4   12.3

696 A right triangle contains a 38° angle whose adjacent side measures 10 centimeters. What is the length of the hypotenuse, to the *nearest hundredth of a centimeter*?
1   7.88
2   12.69
3   12.80
4   16.24

697 A metal pipe is used to hold up a 9-foot fence, as shown in the diagram below. The pipe makes an angle of 48° with the ground.
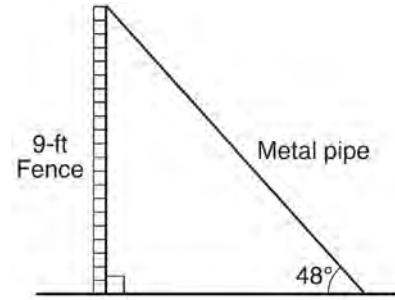
Determine, to the *nearest foot*, how far the bottom of the pipe is from the base of the fence. Determine, to the *nearest foot*, the length of the metal pipe.

698 From the top of an apartment building, the angle of depression to a car parked on the street below is 38 degrees, as shown in the diagram below. The car is parked 80 feet from the base of the building. Find the height of the building, to the *nearest tenth of a foot*.
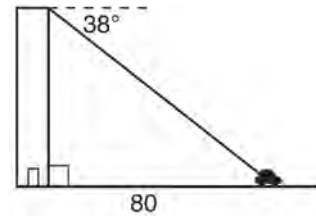
A.A.43: USING TRIGONOMETRY TO FIND AN ANGLE

699 The center pole of a tent is 8 feet long, and a side of the tent is 12 feet long as shown in the diagram below.
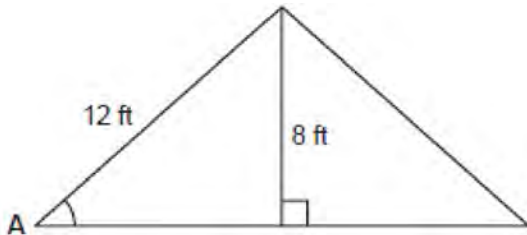
If a right angle is formed where the center pole meets the ground, what is the measure of angle *A* to the *nearest degree*?
1   34
2   42
3   48
4   56

700 Which equation could be used to find the measure of one acute angle in the right triangle shown below?
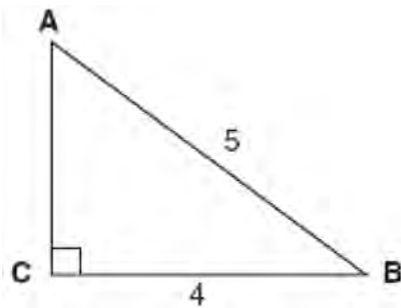
1    $\sin A = \dfrac{4}{5}$

2    $\tan A = \dfrac{5}{4}$

3    $\cos B = \dfrac{5}{4}$

4    $\tan B = \dfrac{4}{5}$

701 In the diagram of $\triangle ABC$ shown below, $BC = 10$ and $AB = 16$.
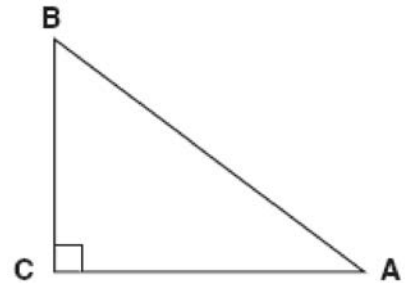
To the *nearest tenth of a degree*, what is the measure of the largest acute angle in the triangle?
1   32.0
2   38.7
3   51.3
4   90.0

702 In right triangle *ABC*, $AB = 20$, $AC = 12$, $BC = 16$, and $m\angle C = 90$. Find, to the *nearest degree*, the measure of $\angle A$.

703 A communications company is building a 30-foot antenna to carry cell phone transmissions. As shown in the diagram below, a 50-foot wire from the top of the antenna to the ground is used to stabilize the antenna.
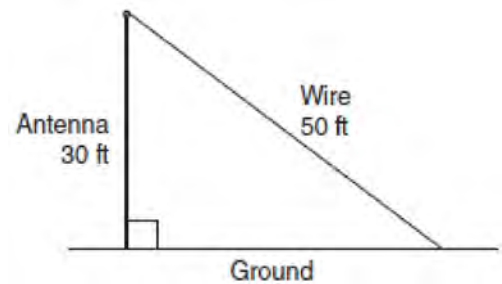
Find, to the *nearest degree,* the measure of the angle that the wire makes with the ground.

704 In right triangle *ABC* shown below, *AB* = 18.3 and *BC* = 11.2.
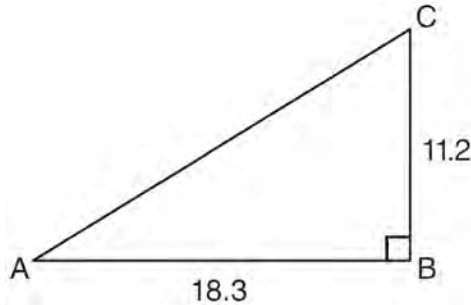
What is the measure of ∠*A*, to the *nearest tenth of a degree*?

1   31.5
2   37.7
3   52.3
4   58.5

705 A trapezoid is shown below.
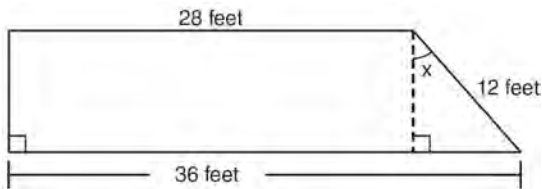
Calculate the measure of angle *x*, to the *nearest tenth of a degree*.

706 A 28-foot ladder is leaning against a house. The bottom of the ladder is 6 feet from the base of the house. Find the measure of the angle formed by the ladder and the ground, to the *nearest degree*.

707 In right triangle *ABC* shown below, *AC* = 29 inches, *AB* = 17 inches, and m∠*ABC* = 90. Find the number of degrees in the measure of angle *BAC*, to the *nearest degree*.
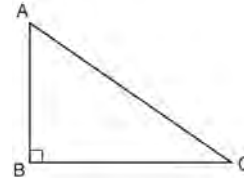
Find the length of $\overline{BC}$ to the *nearest inch*.

708 Which equation could be used to find the measure of angle *D* in the right triangle shown in the diagram below?
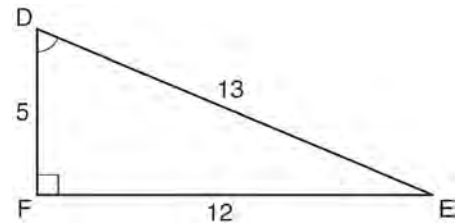
1   $\cos D = \dfrac{12}{13}$

2   $\cos D = \dfrac{13}{12}$

3   $\sin D = \dfrac{5}{13}$

4   $\sin D = \dfrac{12}{13}$

709 A man standing on level ground is 1000 feet away from the base of a 350-foot-tall building. Find, to the *nearest degree*, the measure of the angle of elevation to the top of the building from the point on the ground where the man is standing.

MEASURING IN THE PLANE AND SPACE
A.G.1: COMPOSITIONS OF POLYGONS AND CIRCLES

710 Serena's garden is a rectangle joined with a semicircle, as shown in the diagram below. Line segment *AB* is the diameter of semicircle *P*. Serena wants to put a fence around her garden.
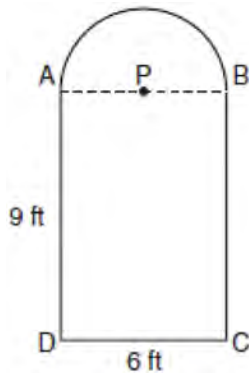
Calculate the length of fence Serena needs to the *nearest tenth of a foot*.

711 A designer created the logo shown below. The logo consists of a square and four quarter-circles of equal size.
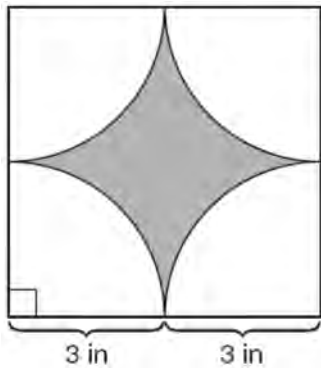
Express, in terms of π, the exact area, in square inches, of the shaded region.

712 Luis is going to paint a basketball court on his driveway, as shown in the diagram below. This basketball court consists of a rectangle and a semicircle.
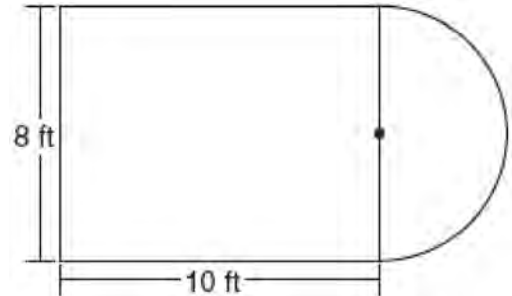
Which expression represents the area of this basketball court, in square feet?
1   80
2   $80 + 8\pi$
3   $80 + 16\pi$
4   $80 + 64\pi$

713 A window is made up of a single piece of glass in the shape of a semicircle and a rectangle, as shown in the diagram below. Tess is decorating for a party and wants to put a string of lights all the way around the outside edge of the window.
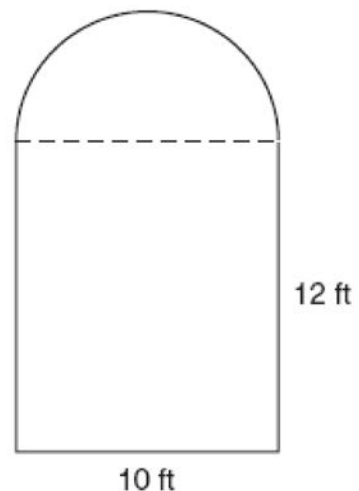
To the *nearest foot*, what is the length of the string of lights that Tess will need to decorate the window?

714 In the diagram below, the circumference of circle O is 16π inches. The length of $\overline{BC}$ is three-quarters of the length of diameter $\overline{AD}$ and $CE = 4$ inches. Calculate the area, in square inches, of trapezoid $ABCD$.

716 A figure is made up of a rectangle and a semicircle as shown in the diagram below.

What is the area of the figure, to the *nearest tenth of a square centimeter?*
1   39.4
2   44.1
3   48.8
4   58.3
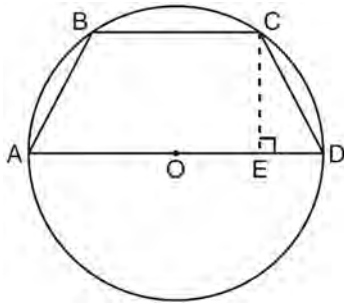
715 A playground in a local community consists of a rectangle and two semicircles, as shown in the diagram below.

717 In the diagram below, *MATH* is a rectangle, $GB = 4.6$, $MH = 6$, and $HT = 15$.
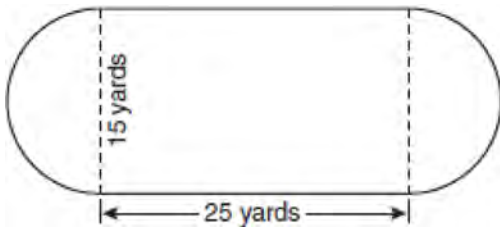
Which expression represents the amount of fencing, in yards, that would be needed to completely enclose the playground?
1   $15\pi + 50$
2   $15\pi + 80$
3   $30\pi + 50$
4   $30\pi + 80$
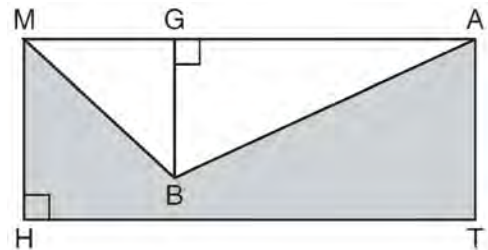
What is the area of polygon *MBATH*?
1   34.5
2   55.5
3   90.0
4   124.5

718 The figure shown below is composed of two rectangles and a quarter circle.
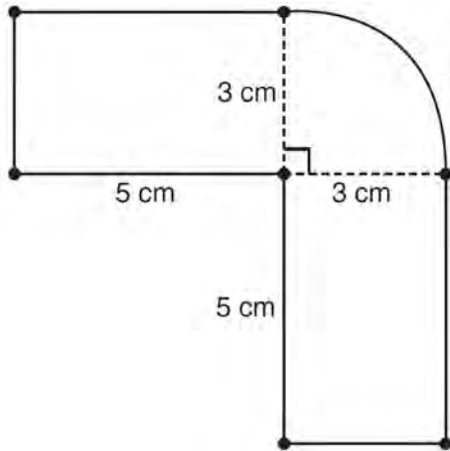
What is the area of this figure, to the *nearest square centimeter?*
1   33
2   37
3   44
4   58

719 A garden is in the shape of an isosceles trapezoid and a semicircle, as shown in the diagram below. A fence will be put around the perimeter of the entire garden.
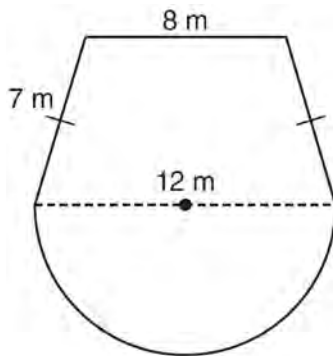
Which expression represents the length of fencing, in meters, that will be needed?
1   $22 + 6\pi$
2   $22 + 12\pi$
3   $15 + 6\pi$
4   $15 + 12\pi$

720 In the diagram below, circle O is inscribed in square $ABCD$. The square has an area of 36.
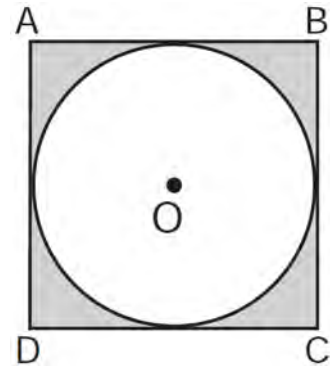
What is the area of the circle?
1   9?
2   6?
3   3?
4   36?

721 What is the perimeter of the figure shown below, which consists of an isosceles trapezoid and a semicircle?
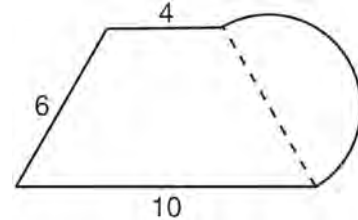
1   $20 + 3\pi$
2   $20 + 6\pi$
3   $26 + 3\pi$
4   $26 + 6\pi$

722 In the figure below, *ABCD* is a square and semicircle *O* has a radius of 6.
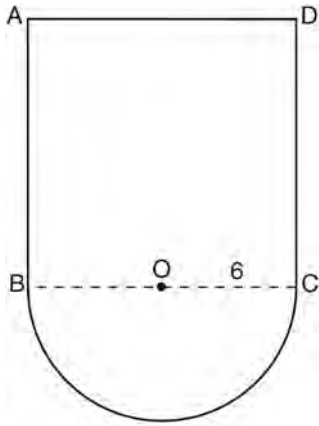
What is the area of the figure?
1   $36 + 6\pi$
2   $36 + 18\pi$
3   $144 + 18\pi$
4   $144 + 36\pi$

723 In the diagram below of rectangle *AFEB* and a semicircle with diameter $\overline{CD}$, *AB* = 5 inches, *AB = BC = DE = FE*, and *CD* = 6 inches. Find the area of the shaded region, to the *nearest hundredth of a square inch*.
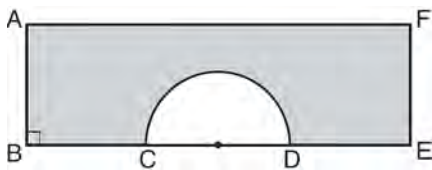
724 A designer created a garden, as shown in the diagram below. The garden consists of four quarter-circles of equal size inside a square. The designer put a fence around both the inside and the outside of the garden.

5 yd   5 yd
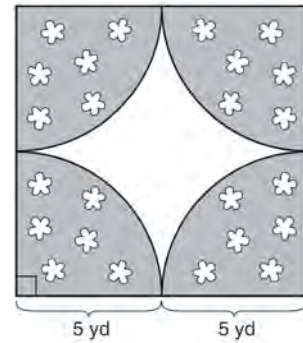
Which expression represents the amount of fencing, in yards, that the designer used for the fence?
1   $40 + 10\pi$
2   $40 + 25\pi$
3   $100 + 10\pi$
4   $100 + 25\pi$

725 A figure consists of a square and a semicircle, as shown in the diagram below.
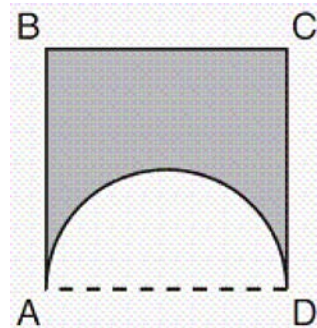
If the length of a side of the square is 6, what is the area of the shaded region?
1   $36 - 3\pi$
2   $36 - 4.5\pi$
3   $36 - 6\pi$
4   $36 - 9\pi$

A.G.2: VOLUME

726 A cylindrical container has a diameter of 12 inches and a height of 15 inches, as illustrated in the diagram below.

15 in

12 in
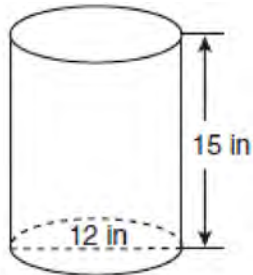
(Not drawn to scale)

What is the volume of this container to the *nearest tenth* of a cubic inch?
1   6,785.8
2   4,241.2
3   2,160.0
4   1,696.5

727 Lenny made a cube in technology class. Each edge measured 1.5 cm. What is the volume of the cube in cubic centimeters?
1   2.25
2   3.375
3   9.0
4   13.5

728 A soup can is in the shape of a cylinder. The can has a volume of 342 cm^3 and a diameter of 6 cm. Express the height of the can in terms of π. Determine the maximum number of soup cans that can be stacked on their base between two shelves if the distance between the shelves is exactly 36 cm. Explain your answer.

729 The diagram below represents Joe's two fish tanks.
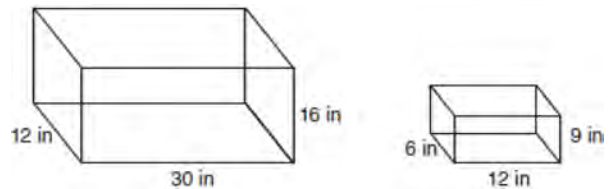
Joe's larger tank is completely filled with water. He takes water from it to completely fill the small tank. Determine how many cubic inches of water will remain in the larger tank.

730 A cylinder has a diameter of 10 inches and a height of 2.3 inches. What is the volume of this cylinder, to the *nearest tenth of a cubic inch*?
1   72.3
2   83.1
3   180.6
4   722.6

731 Mike buys his ice cream packed in a rectangular prism-shaped carton, while Carol buys hers in a cylindrical-shaped carton. The dimensions of the prism are 5 inches by 3.5 inches by 7 inches. The cylinder has a diameter of 5 inches and a height of 7 inches. Which container holds more ice cream? Justify your answer. Determine, to the *nearest tenth of a cubic inch*, how much more ice cream the larger container holds.

732 The volume of a cylindrical can in 32π cubic inches. If the height of the can is 2 inches, what is its radius, in inches?
1   8
2   2
3   16
4   4

733 How many cubes with 5-inch sides will completely fill a cube that is 10 inches on a side?
1   50
2   25
3   8
4   4

734 Oatmeal is packaged in a cylindrical container, as shown in the diagram below.
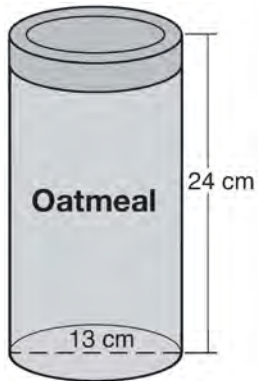
The diameter of the container is 13 centimeters and its height is 24 centimeters. Determine, in terms of π, the volume of the cylinder, in cubic centimeters.

A.G.2: SURFACE AREA

735 Mrs. Ayer is painting the outside of her son's toy box, including the top and bottom. The toy box measures 3 feet long, 1.5 feet wide, and 2 feet high. What is the total surface area she will paint?

1   9.0 ft^2
2   13.5 ft^2
3   22.5 ft^2
4   27.0 ft^2

736 How many square inches of wrapping paper are needed to entirely cover a box that is 2 inches by 3 inches by 4 inches?

1   18
2   24
3   26
4   52

737 Find the volume, in cubic centimeters, *and* the surface area, in square centimeters, of the rectangular prism shown below.
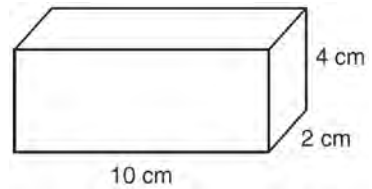
738 A plastic storage box in the shape of a rectangular prism has a length of $x + 3$, a width of $x - 4$, and a height of 5. Represent the surface area of the box as a trinomial in terms of x.

739 The length and width of the base of a rectangular prism are 5.5 cm and 3 cm. The height of the prism is 6.75 cm. Find the *exact* value of the surface area of the prism, in square centimeters.

740 The rectangular prism shown below has a length of 3.0 cm, a width of 2.2 cm, and a height of 7.5 cm.
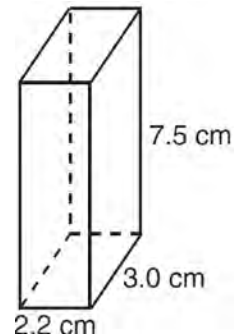
What is the surface area, in square centimeters?

1   45.6
2   49.5
3   78.0
4   91.2

741 If the volume of a cube is 8 cubic centimeters, what is its surface area, in square centimeters?

1   32
2   24
3   12
4   4

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic
Answer Section

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

   PTS: 2   REF: 080923ia   STA: A.N.6   TOP: Evaluating Expressions
2 ANS: 1
$$-\left|a-b\right| = -\left|7-(-3)\right| = -\left|-10\right| = -10$$

   PTS: 2   REF: 011010ia   STA: A.N.6   TOP: Evaluating Expressions
3 ANS: 2   PTS: 2   REF: 011110ia   STA: A.N.6
   TOP: Evaluating Expressions
4 ANS: 1
$$-3(-4)^2(2)+4(-4) = -96-16 = -112$$

   PTS: 2   REF: 081113ia   STA: A.N.6   TOP: Evaluating Expressions
5 ANS: 1
$$\left|\frac{4(-6)+18}{4!}\right| = \left|\frac{-6}{24}\right| = \frac{1}{4}$$

   PTS: 2   REF: 081220ia   STA: A.N.6   TOP: Evaluating Expressions
6 ANS: 2
$$\left|-3-4\right| - (-3)^2 = 7-9 = -2$$

   PTS: 2   REF: 011321ia   STA: A.N.6   TOP: Evaluating Expressions
7 ANS: 3
$$6!+\frac{5!(3!)}{4!}-10 = 720+5(6)-10 = 740$$

   PTS: 2   REF: 061309ia   STA: A.N.6   TOP: Evaluating Expressions
8 ANS: 3
$$2(4)^0 + (4)! = 2+24 = 26$$

   PTS: 2   REF: 011421ia   STA: A.N.6   TOP: Evaluating Expressions
9 ANS: 3   PTS: 2   REF: fall0705ia   STA: A.N.1
   TOP: Identifying Properties
10 ANS: 2   PTS: 2   REF: 080802ia   STA: A.N.1
   TOP: Identifying Properties
11 ANS:
   (1) Distributive; (2) Commutative

   PTS: 2   REF: 061132ia   STA: A.N.1   TOP: Identifying Properties
12 ANS: 1   PTS: 2   REF: 081319ia   STA: A.N.1
   TOP: Identifying Properties

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

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

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

15 ANS: 4   PTS: 2   REF: 011114ia   STA: A.N.1
TOP: Properties of Reals

16 ANS: 3   PTS: 2   REF: 011224ia   STA: A.N.1
TOP: Properties of Reals

17 ANS: 1   PTS: 2   REF: 081209ia   STA: A.N.1
TOP: Properties of Reals

18 ANS: 3   PTS: 2   REF: 011428ia   STA: A.N.1
TOP: Properties of Reals

19 ANS: 4   PTS: 2   REF: fall0704ia   STA: A.A.29
TOP: Set Theory

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

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

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

23 ANS: 4   PTS: 2   REF: 081022ia   STA: A.A.29
TOP: Set Theory

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

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

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

27 ANS: 4   PTS: 2   REF: 011222ia   STA: A.A.29
TOP: Set Theory

28 ANS: 3   PTS: 2   REF: 061217ia   STA: A.A.29
TOP: Set Theory

29 ANS: 4   PTS: 2   REF: 011318ia   STA: A.A.29
TOP: Set Theory

30 ANS: 1   PTS: 2   REF: 061310ia   STA: A.A.29
TOP: Set Theory

31 ANS: 4   PTS: 2   REF: 081321ia   STA: A.A.29
TOP: Set Theory

32 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

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

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

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

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

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

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

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

38 ANS: 2
$A = \{4, 9, 16, 25, 36, 49, 64, 81, 100\}$

PTS: 2 REF: 011326ia STA: A.A.30 TOP: Set Theory

39 ANS: 4
$A = \{1, 3, 5, 7, 9, 11, 13, 15, 17, 19\}$

PTS: 2 REF: 081306ia STA: A.A.30 TOP: Set Theory

40 ANS: 4 PTS: 2 REF: 011426ia STA: A.A.30
TOP: Set Theory

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

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

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

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

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

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

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

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

48 ANS: 3 PTS: 2 REF: 061208ia STA: A.A.31
TOP: Set Theory

49 ANS: 3
$A \cup C = \{1, 2, 3, 5, 7, 9\}$

PTS: 2 REF: 081221ia STA: A.A.31 TOP: Set Theory

50 ANS: 3   PTS: 2   REF: 061324ia   STA: A.A.31
TOP: Set Theory

51 ANS:

Number of Days Outside

Interval	Tally	Frequency
0–1	III	3
2–3	HT II	7
4–5	HT II	7
6–7	III	3

Number of Days Outside

Interval	Cumulative Frequency
0–1	3
0–3	10
0–5	17
0–7	20
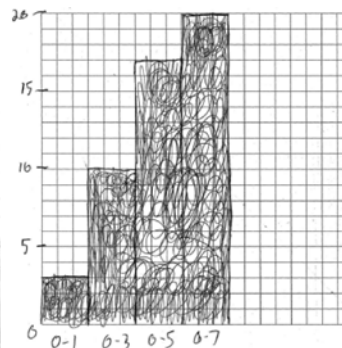
PTS: 4   REF: 080838ia   STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables   KEY: cumulative frequency histograms

52 ANS:

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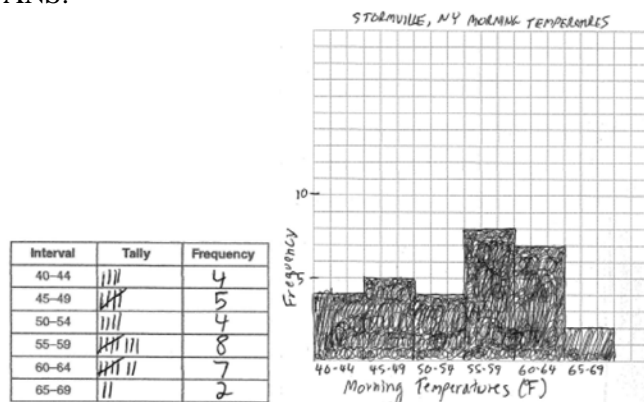
PTS: 4   REF: 060938ia   STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables   KEY: frequency histograms

53 ANS:

Interval	Tally	Frequency
51–60	||	2
61–70	||	2
71–80	||||	4
81–90	|||||	6
91–100	||||	4
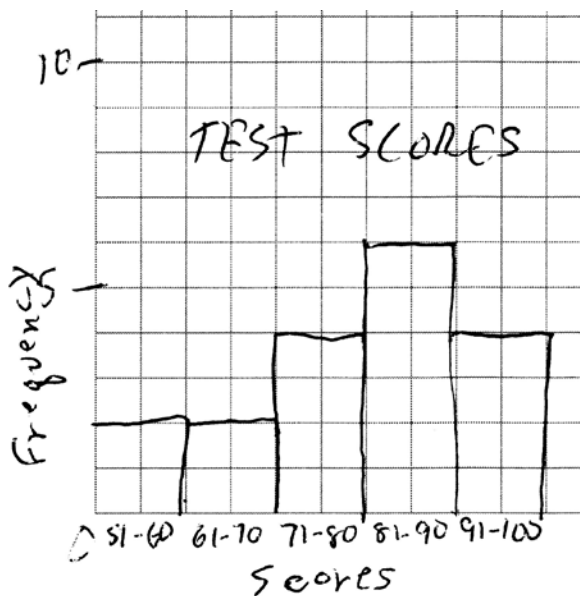
PTS: 3   REF: 011135ia   STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables   KEY: frequency histograms

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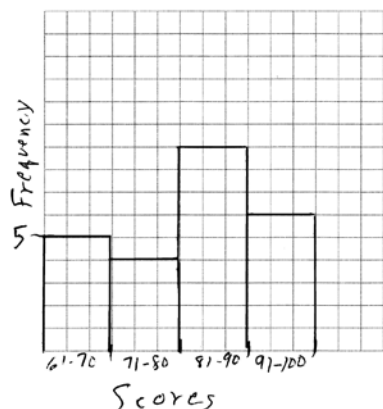
PTS: 2   REF: 081132ia   STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables   KEY: frequency histograms

55 ANS: 3
25 − 18 = 7

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

56 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

57 ANS: 3   PTS: 2   REF: 061230ia   STA: A.S.9
TOP: Frequency Histograms, Bar Graphs and Tables

58 ANS:
   3, 0, 20. 15 – 12 = 3. 12 – 12 = 0

   PTS: 3   REF: 081234ia   STA: A.S.9
   TOP: Frequency Histograms, Bar Graphs and Tables
59 ANS:
   If there are 31 students. the 16th student's time represents the median. The 16th time is in the 41-80 interval on the cumulative frequency table and the 71-80 interval on the related frequency table.

   PTS: 2   REF: 011432ia   STA: A.S.9
   TOP: Frequency Histograms, Bar Graphs and Tables
60 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
61 ANS:
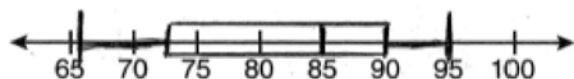
   PTS: 4   REF: 080939ia   STA: A.S.5   TOP: Box-and-Whisker Plots
62 ANS:
   minimum is 120, 1st quartile is 145, median is 292, 3rd quartile is 407, and maximum is 452
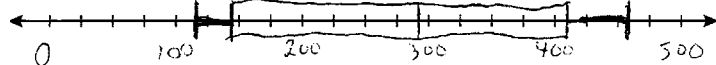
   PTS: 3   REF: 081034ia   STA: A.S.5   TOP: Box-and-Whisker Plots
63 ANS:
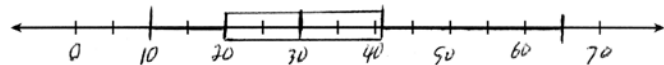
 . Three scores are above 41.

   PTS: 4   REF: 011337ia   STA: A.S.5   TOP: Box-and-Whisker Plots
64 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
65 ANS: 4   PTS: 2   REF: 010929ia   STA: A.S.6
   TOP: Box-and-Whisker Plots
66 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
67 ANS: 1   PTS: 2   REF: 011001ia   STA: A.S.6
   TOP: Box-and-Whisker Plots
68 ANS: 3
   75 – 15 = 60

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

69 ANS: 2   PTS: 2   REF: 081106ia   STA: A.S.6
    TOP: Box-and-Whisker Plots
70 ANS: 3   PTS: 2   REF: 011220ia   STA: A.S.6
    TOP: Box-and-Whisker Plots
71 ANS: 2   PTS: 2   REF: 061314ia   STA: A.S.6
    TOP: Box-and-Whisker Plots
72 ANS: 4   PTS: 2   REF: 081312ia   STA: A.S.6
    TOP: Box-and-Whisker Plots
73 ANS: 3   PTS: 2   REF: 011408ia   STA: A.S.6
    TOP: Box-and-Whisker Plots
74 ANS: 3   PTS: 2   REF: 061017ia   STA: A.S.11
    TOP: Quartiles and Percentiles
75 ANS: 4

$\dfrac{95000}{125000} = .76$

    PTS: 2   REF: 061207ia   STA: A.S.11   TOP: Quartiles and Percentiles
76 ANS: 2   PTS: 2   REF: fall0701ia   STA: A.S.7
    TOP: Scatter Plots
77 ANS: 3   PTS: 2   REF: 081001ia   STA: A.S.7
    TOP: Scatter Plots
78 ANS: 2   PTS: 2   REF: 061115ia   STA: A.S.7
    TOP: Scatter Plots
79 ANS: 4

    PTS: 2   REF: 080822ia   STA: A.S.8   TOP: Scatter Plots
80 ANS:
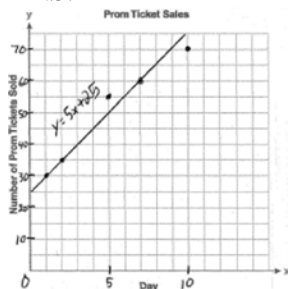
    PTS: 3   REF: 060936ia   STA: A.S.8   TOP: Scatter Plots
81 ANS: 4   PTS: 2   REF: 011229ia   STA: A.S.8
    TOP: Scatter Plots

7

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

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

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

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

86 ANS: 2   PTS: 2   REF: 061205ia   STA: A.S.12
   TOP: Scatter Plots

87 ANS: 1   PTS: 2   REF: 081204ia   STA: A.S.12
   TOP: Scatter Plots

88 ANS: 1   PTS: 2   REF: 011301ia   STA: A.S.12
   TOP: Scatter Plots

89 ANS: 1   PTS: 2   REF: 081301ia   STA: A.S.12
   TOP: Scatter Plots

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

91 ANS:
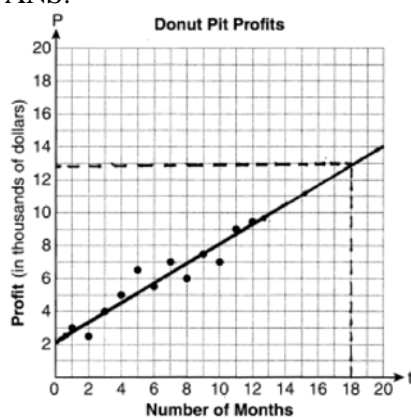
They will not reach their goal in 18 months.

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

92 ANS: 3   PTS: 2   REF: 081208ia   STA: A.S.17
   TOP: Scatter Plots

93 ANS: 3   PTS: 2   REF: 061303ia   STA: A.S.17
   TOP: Scatter Plots

94 ANS: 2   PTS: 2   REF: 011411ia   STA: A.S.17
   TOP: Scatter Plots

95 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

96 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

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

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

98 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

99 ANS: 3
mean $= 81\dfrac{7}{11}$, median $= 81$ and mode $= 76$

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

100 ANS: 2
mean = 7, median = 6 and mode = 6

PTS: 2   REF: 011329ia   STA: A.S.4   TOP: Central Tendency

101 ANS:
81.3, 80, both increase

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

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

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

103 ANS: 2   PTS: 2   REF: 081327ia   STA: A.S.16
TOP: Central Tendency

104 ANS: 4
$$\dfrac{2+3+0+1+3+2+4+0+2+3}{10} = \dfrac{20}{10} = 2 \quad \dfrac{x}{10} = 2 + 0.5$$
$$x = 25$$

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

105 ANS: 3
The other situations are quantitative.

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

106 ANS: 3
The other situations are quantitative.

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

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

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

108 ANS: 4
The other situations are quantitative.

PTS: 2   REF: 081122ia STA: A.S.1 TOP: Analysis of Data

109 ANS: 2
The other sets of data are qualitative.

PTS: 2   REF: 011211ia STA: A.S.1 TOP: Analysis of Data

110 ANS: 3
The other situations are qualitative.

PTS: 2   REF: 081213ia STA: A.S.1 TOP: Analysis of Data

111 ANS: 1
The other situations are quantitative.

PTS: 2   REF: 061308ia STA: A.S.1 TOP: Analysis of Data

112 ANS: 3
The other situations are quantitative.

PTS: 2   REF: 081313ia STA: A.S.1 TOP: Analysis of Data

113 ANS: 3
The other situations are qualitative.

PTS: 2   REF: 011414ia STA: A.S.1 TOP: Analysis of Data

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

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

115 ANS: 3
Frequency is not a variable.

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

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

117 ANS: 3   PTS: 2   REF: 061206ia STA: A.S.2
TOP: Analysis of Data

118 ANS: 3
Due to lack of specificity in the wording, this 13th question was removed from the June, 2013 Regents Exam.

PTS: 2   REF: 061313ia STA: A.S.2 TOP: Analysis of Data

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

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

120 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
121 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
122 ANS: 4   PTS: 2   REF: 061022ia   STA: A.S.3
TOP: Analysis of Data
123 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
124 ANS: 2
People at a gym or football game and members of a soccer team are more biased towards sports.

PTS: 2   REF: 061202ia   STA: A.S.3   TOP: Analysis of Data
125 ANS: 2
To determine student opinion, survey the widest range of students.

PTS: 2   REF: 011313ia   STA: A.S.3   TOP: Analysis of Data
126 ANS: 3   PTS: 2   REF: 011404ia   STA: A.S.3
TOP: Analysis of Data
127 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
128 ANS: 2   PTS: 2   REF: 081104ia   STA: A.S.13
TOP: Analysis of Data
129 ANS: 1
A rooster crows before sunrise, not because of the sun.

PTS: 2   REF: fall0707ia   STA: A.S.14   TOP: Analysis of Data
130 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
131 ANS: 3   PTS: 2   REF: 081017a   STA: A.S.14
TOP: Analysis of Data
132 ANS: 2   PTS: 2   REF: 061122ia   STA: A.S.14
TOP: Analysis of Data
133 ANS: 1   PTS: 2   REF: fall0723ia   STA: A.M.3
TOP: Error   KEY: area

134 ANS:

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

than 1% would seem to be insignificant.

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

135 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

136 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

137 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 $\left| \dfrac{9.261 - 8}{9.261} \right| \approx 0.14$.

PTS: 2   REF: 060928ia   STA: A.M.3   TOP: Error
KEY: volume and surface area

138 ANS: 2

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

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

139 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

140 ANS:

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

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

141 ANS: 2

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

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

142 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

143 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

144 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

145 ANS: 2

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

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

146 ANS:

$$\frac{8100 - 7678.5}{7678.5} \approx 0.055$$

PTS: 2   REF: 061233ia   STA: A.M.3   TOP: Error
KEY: area

147 ANS:

$$\frac{(5.9 \times 10.3 \times 1.7) - (6 \times 10 \times 1.5)}{5.9 \times 10.3 \times 1.7} \approx 0.129$$

PTS: 3   REF: 081235ia   STA: A.M.3   TOP: Error
KEY: volume and surface area

148 ANS:

$$\left| \frac{(24.2 \times 14.1) - (24 \times 14)}{(24.2 \times 14.1)} \right| = \frac{5.22}{341.22} \approx 0.015$$

PTS: 3   REF: 011336ia   STA: A.M.3   TOP: Error
KEY: area

149 ANS:

$$\frac{(10.75)(12.5) - (10.5)(12.25)}{(10.75)(12.5)} \approx 0.043$$

PTS: 3   REF: 081336ia   STA: A.M.3   TOP: Error
KEY: area

150 ANS:

$$\frac{6(5.2)^2 - 6(5)^2}{6(5.2)^2} \approx .075$$

PTS: 3   REF: 011435ia   STA: A.M.3   TOP: Error
KEY: volume and surface area

151 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

152 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

153 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

154 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

155 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

156 ANS:
(C,B,T), (C,B,5), (C,N,T), (C,N,5), (C,2,T), (C,2,5), (F,B,T), (F,B,5), (F,N,T), (F,N,5), (F,2,T), (F,2,5). 1, 2.

PTS: 4   REF: 081237ia   STA: A.S.19   TOP: Sample Space

157 ANS:
(1,A), (1,B), (1,C), (3,A), (3,B), (3,C), (5,A), (5,B), (5,C), (7,A), (7,B), (7,C), (9,A), (9,B), (9,C). 6

PTS: 3   REF: 011334ia   STA: A.S.19   TOP: Sample Space

158 ANS: 3
$(2, T), (4, T), (6, T)$

PTS: 2   REF: 081324ia   STA: A.S.19   TOP: Sample Space

159 ANS:
cap-jacket: TT, TR, TW, BB, BR, BW, RB, RR, RW, GB, GR, GW, 10, 6.

PTS: 4   REF: 011439ia   STA: A.S.19   TOP: Sample Space

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

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

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

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

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

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

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

164 ANS: 2   PTS: 2   REF: 011415ia   STA: A.S.21
TOP: Experimental Probability

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

166 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

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

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

168 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

169 ANS: 3

$P(O) = \dfrac{5}{10}$, $P(P) = \dfrac{4}{10}$, $P(\le 5) = \dfrac{6}{10}$, $P(/3) = \dfrac{4}{10}$

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

170 ANS:
White. There are 31 white blocks, 30 red blocks and 29 blue blocks.

PTS: 2   REF: 061232ia   STA: A.S.22   TOP: Theoretical Probability

171 ANS: 4

$P(\text{odd}) = \dfrac{7 + 14 + 20}{75} = \dfrac{41}{75}$. $P(\text{even}) = \dfrac{22 + 6 + 6}{75} = \dfrac{34}{75}$. $P(3 \text{ or less}) = \dfrac{14 + 22 + 7}{75} = \dfrac{43}{75}$.

$P(2 \text{ or } 4) = \dfrac{22 + 6}{75} = \dfrac{28}{75}$

PTS: 2   REF: 011325ia   STA: A.S.22   TOP: Theoretical Probability

172 ANS: 4   PTS: 2   REF: 081303ia   STA: A.S.22
TOP: Theoretical Probability

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

174 ANS: 2

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

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

PTS: 2   REF: 080830ia   STA: A.S.23   TOP: Theoretical Probability
KEY: not mutually exclusive events

175 ANS: 3

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

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

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

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

176 ANS:

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

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

177 ANS: 2   PTS: 2   REF: 011212ia   STA: A.S.23
     TOP: Theoretical Probability   KEY: independent events
178 ANS: 4   PTS: 2   REF: 081229ia   STA: A.S.23
     TOP: Theoretical Probability   KEY: independent events
179 ANS:

$$\frac{5}{8} \times \frac{3}{7} = \frac{15}{56}. \quad \frac{5}{8} \times \frac{4}{7} = \frac{20}{56}. \quad \frac{20}{56} + \frac{3}{8} \times \frac{2}{7} = \frac{26}{56}$$

     PTS: 4   REF: 061338ia   STA: A.S.23   TOP: Theoretical Probability
     KEY: dependent events
180 ANS:

$$\frac{12}{20} \times \frac{8}{19} + \frac{8}{20} \times \frac{12}{19} = \frac{192}{380}. \quad 1 - P(BB) = 1 - \left(\frac{8}{20} \times \frac{7}{19} \right) = \frac{380}{380} - \frac{56}{380} = \frac{324}{380}$$

     PTS: 4   REF: 081339ia   STA: A.S.23   TOP: Theoretical Probability
     KEY: dependent events
181 ANS: 3   PTS: 2   REF: 080907ia   STA: A.S.20
     TOP: Geometric Probability
182 ANS:

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

     PTS: 2   REF: 011132ia   STA: A.S.20   TOP: Geometric Probability
183 ANS: 3   PTS: 2   REF: 061218ia   STA: A.S.20
     TOP: Geometric Probability
184 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
185 ANS: 3

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

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

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

     PTS: 2   REF: 080832ia   STA: A.S.23   TOP: Geometric Probability
187 ANS: 1

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

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

188 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

189 ANS: 4   PTS: 2   REF: 011308ia   STA: A.S.18

TOP: Conditional Probability

190 ANS: 1

$$\frac{20-6}{(20-6)+15+7+8} = \frac{14}{44}$$

PTS: 2   REF: 061302ia   STA: A.S.18   TOP: Conditional Probability

191 ANS: 3

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

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

192 ANS: 4

$5 \times 2 \times 3 = 30$

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

193 ANS:

$5 \times 3 \times 5 \times 3 = 225$. $1 \times 3 \times 5 \times 3 = 45$. $1 \times 2 \times 5 \times 3 = 30$

PTS: 4   REF: 061334ia   STA: A.N.7   TOP: Multiplication Counting Principle

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

TOP: Permutations

195 ANS: 1

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

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

196 ANS:

60. $_5P_3 = 60$

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

197 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

198 ANS: 4

$_8P_3 = 336$

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

199 ANS: 3

$_6P_4 = 360$

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

200 ANS: 4

$_5P_5 = 5 \times 4 \times 3 \times 2 \times 1 = 120$

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

201 ANS:

$26 \times 25 \times 24 \times 23 = 358,800.$ $10^6 = 1,000,000.$ Use the numeric password since there are over 500,000 employees

PTS: 4 REF: 061239ia STA: A.N.8 TOP: Permutations

202 ANS: 3

$_{18}P_3 = 4896$

PTS: 2 REF: 061328ia STA: A.N.8 TOP: Permutations

203 ANS: 4

$25(x - 3) = 25x - 75$

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

204 ANS: 4

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

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

205 ANS: 2 PTS: 2 REF: 060904ia STA: A.A.1

TOP: Expressions

206 ANS: 4

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

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

207 ANS: 3 PTS: 2 REF: 011104ia STA: A.A.1

TOP: Expressions

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

TOP: Expressions

209 ANS: 3 PTS: 2 REF: 011205ia STA: A.A.1

TOP: Expressions

210 ANS: 1 PTS: 2 REF: 061204ia STA: A.A.1

TOP: Expressions

211 ANS: 2 PTS: 2 REF: 081215ia STA: A.A.1

TOP: Expressions

212 ANS: 1 PTS: 2 REF: 011303ia STA: A.A.1

TOP: Expressions

213 ANS: 1 PTS: 2 REF: 061301ia STA: A.A.1

TOP: Expressions

214 ANS: 3 PTS: 2 REF: 061323ia STA: A.A.1

TOP: Expressions

215 ANS: 2 PTS: 2 REF: 081305ia STA: A.A.1

TOP: Expressions

216 ANS: 4
$x + x + 2 + x + 4 = 3x + 6$

PTS: 2   REF: 011430ia   STA: A.A.1   TOP: Expressions

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

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

219 ANS: 3   PTS: 2   REF: 061119ia   STA: A.A.2
TOP: Expressions

220 ANS: 1   PTS: 2   REF: 011311ia   STA: A.A.2
TOP: Expressions

221 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

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

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

224 ANS: 2   PTS: 2   REF: 061121ia   STA: A.A.3
TOP: Expressions

225 ANS: 2   PTS: 2   REF: 011227ia   STA: A.A.3
TOP: Expressions

226 ANS: 4   PTS: 2   REF: 011401ia   STA: A.A.3
TOP: Expressions

227 ANS:
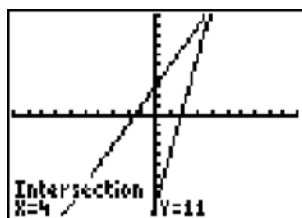
4. $3 + 2g = 5g - 9$

     $12 = 3g$

      $g = 4$

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

228 ANS: 4
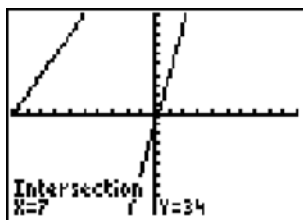
$5p - 1 = 2p + 20$

$3p = 21$

$p = 7$

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

229 ANS: 2

Debbie failed to distribute the 3 properly.

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

230 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

231 ANS:

4. $3(x + 1) - 5x = 12 - (6x - 7)$

$3x + 3 - 5x = 12 - 6x + 7$

$-2x + 3 = -6x + 19$

$4x = 16$

$x = 4$

PTS: 4   REF: 061238ia   STA: A.A.22   TOP: Solving Equations

232 ANS: 4

$5 - 2x = -4x - 7$

$2x = -12$

$x = -6$

PTS: 2   REF: 011305ia   STA: A.A.22   TOP: Solving Equations

233   ANS: 4
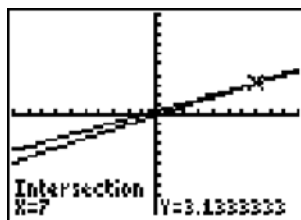
$$\frac{2x}{5} + \frac{1}{3} = \frac{7x - 2}{15}$$

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

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

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

$$x = 7$$

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

234   ANS: 1
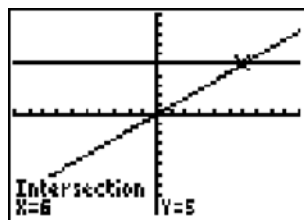
$$\frac{(2x \times 6) + (3 \times x)}{3 \times 6} = 5$$

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

$$15x = 90$$

$$x = 6$$

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

235   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

236 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

237 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

238 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

239 ANS: 1

$$\frac{1}{7} + \frac{2x}{3} = \frac{15x - 3}{21}$$

$$\frac{14x + 3}{21} = \frac{15x - 3}{21}$$

$$14x + 3 = 15x - 3$$

$$x = 6$$

PTS: 2 REF: 011328ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions

23

240 ANS: 3

$0.06y + 200 = 0.03y + 350$

$0.03y = 150$

$y = 5,000$

PTS: 2   REF: 081203ia   STA: A.A.25   TOP: Solving Equations with Decimals

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

242 ANS: 3   PTS: 2   REF: 011413ia   STA: A.A.4
TOP: Modeling Equations

243 ANS: 4

$w(w + 5) = 36$

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

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

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

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

246 ANS: 3   PTS: 2   REF: 061225ia   STA: A.A.5
TOP: Modeling Equations

247 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

248 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

249 ANS: 4

$3 + 2 - 1 = 4$

PTS: 2   REF: 081320ia   STA: A.A.6   TOP: Venn Diagrams

250 ANS: 3

$3ax + b = c$

$3ax = c - b$

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

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

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic
Answer Section

251 ANS: 2

$$P = 2l + 2w$$

$$P - 2l = 2w$$

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

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

252 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

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

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

255 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

256 ANS:

$$bc + ac = ab$$

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

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

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

257 ANS: 1

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

$$rs = 2x + t$$

$$rs - t = 2x$$

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

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

258 ANS: 1

$$k = am + 3mx$$

$$k = m(a + 3x)$$

$$\frac{k}{a + 3x} = m$$

PTS: 2   REF: 061215ia   STA: A.A.23   TOP: Transforming Formulas

259 ANS: 3   PTS: 2   REF: 081230ia   STA: A.A.23
TOP: Transforming Formulas

260 ANS: 1

$$rx - st = r$$

$$rx = r + st$$

$$x = \frac{r + st}{r}$$

PTS: 2   REF: 061316ia   STA: A.A.23   TOP: Transforming Formulas

261 ANS: 2

$$2y + 2w = x$$

$$2w = x - 2y$$

$$w = \frac{x - 2y}{2}$$

PTS: 2   REF: 081330ia   STA: A.A.23   TOP: Transforming Formulas

262 ANS: 1

$$abx - 5 = 0$$

$$abx = 5$$

$$x = \frac{5}{ab}$$

PTS: 2   REF: 011425ia   STA: A.A.23   TOP: Transforming Formulas

263 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

2

264 ANS: 3

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

$\qquad\qquad\qquad\qquad x = 5400$

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

265 ANS:

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

$\qquad\quad 25x = 54,000$

$\qquad\qquad x = 2,160$

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

266 ANS: 3

$\dfrac{120}{60} = \dfrac{m}{150}$

$\quad m = 300$

PTS: 2 REF: 081202ia STA: A.M.1 TOP: Using Rate

267 ANS: 2

$\dfrac{20}{3.98} = \dfrac{180}{x}$

$\quad 20x = 716.4$

$\qquad x = 35.82 \approx 36$

PTS: 2 REF: 011302ia STA: A.M.1 TOP: Using Rate

268 ANS:

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

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

269 ANS:

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

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

270 ANS: 4

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

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

271 ANS: 4

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

$$5x = 360$$

$$x = 72$$

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

272 ANS:

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

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

273 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

274 ANS: 1

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

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

275 ANS:

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

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

276 ANS: 1

$$\frac{\text{distance}}{\text{time}} = \frac{350.7}{4.2} = 83.5$$

PTS: 2 REF: 061201ia STA: A.M.1 TOP: Speed

277 ANS:

$$t = \frac{d}{s} = \frac{136,000,000}{31,000} \approx 4387.1 \text{ hours.} \quad \frac{4387.1}{24} \approx 183$$

PTS: 2 REF: 061333ia STA: A.M.1 TOP: Speed

278 ANS: 2

$$d = st = 45 \times 3 = 135 \text{ miles.} \quad t = \frac{d}{s} = \frac{135}{55} \approx 2.5 \text{ hours}$$

PTS: 2 REF: 011419ia STA: A.M.1 TOP: Speed

279 ANS: 3

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

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

280 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
KEY: dimensional analysis

281 ANS:
16. 12 feet equals 4 yards. $4 \times 4 = 16$.

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

282 ANS:

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

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

283 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
KEY: dimensional analysis

284 ANS: 1

$\frac{3}{4} \times 5 = \frac{15}{4} \text{ teaspoons} \times \frac{1 \text{ tablespoon}}{3 \text{ teaspoons}} = \frac{5}{4} = 1\frac{1}{4} \text{ tablespoon}$

PTS: 2   REF: 061228ia   STA: A.M.2   TOP: Conversions
KEY: dimensional analysis

285 ANS: 4

$8900 \text{ ft} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \approx 1.7 \text{ mi}$

PTS: 2   REF: 081210ia   STA: A.M.2   TOP: Conversions
KEY: dimensional analysis

286 ANS: 3   PTS: 2   REF: 011317ia   STA: A.M.2
TOP: Conversions   KEY: dimensional analysis

287 ANS: 4

$$5.5 \text{ g} \times \frac{4 \text{ q}}{1 \text{ g}} \times \frac{32 \text{ oz}}{1 \text{ q}} = 704 \text{ oz}$$

PTS: 2   REF: 061305ia   STA: A.M.2   TOP: Conversions
KEY: dimensional analysis
288 ANS:

$$\frac{5.4 \text{ miles}}{\text{hour}} \times \frac{5280 \text{ feet}}{\text{mile}} \times \frac{1 \text{ hour}}{60 \text{ min}} = \frac{475.2 \text{ ft}}{\text{min}}$$

PTS: 2   REF: 081331ia   STA: A.M.2   TOP: Conversions
KEY: dimensional analysis
289 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
290 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
291 ANS: 2
Candidate *B* received 45%. $45\% \times 1860 = 837$

PTS: 2   REF: 081007ia   STA: A.N.5   TOP: Percents
292 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
293 ANS:
$800 - (895)(0.75)(1.08) = 75.05$

PTS: 3   REF: 081334ia   STA: A.N.5   TOP: Percents
294 ANS:
$d = 6.25h$, 250. $d = 6.25(40) = 250$

PTS: 2   REF: 010933ia   STA: A.N.5   TOP: Direct Variation
295 ANS: 4

$$\frac{150}{20} = \frac{x}{30}$$
$$20x = 4500$$
$$x = 225$$

PTS: 2   REF: 081101ia   STA: A.N.5   TOP: Direct Variation
296 ANS: 2   PTS: 2   REF: 080823ia   STA: A.A.32
TOP: Slope

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

298 ANS: 2   PTS: 2   REF: 081223ia   STA: A.A.32
    TOP: Slope

299 ANS: 3

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

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

300 ANS: 3

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

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

301 ANS: 2

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

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

302 ANS: 1

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

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

303 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

304 ANS: 2

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

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

305 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

306 ANS: 3

$$m = \frac{6 - 4}{3 - (-2)} = \frac{2}{5}$$

    PTS: 2   REF: 061110ia   STA: A.A.33   TOP: Slope

307 ANS: 4

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

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

308 ANS: 2

$$m = \frac{-7 - 1}{4 - 9} = \frac{-8}{-5} = \frac{8}{5}$$

PTS: 2   REF: 081310ia   STA: A.A.33   TOP: Slope

309 ANS: 2

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

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

310 ANS: 4

$$m = \frac{-A}{B} = \frac{-(-3)}{2} = \frac{3}{2}$$

PTS: 2   REF: 061212ia   STA: A.A.37   TOP: Slope

311 ANS: 4

$$m = \frac{-A}{B} = \frac{-4}{3}$$

PTS: 2   REF: 061319ia   STA: A.A.37   TOP: Slope

312 ANS: 2

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

PTS: 2   REF: 011409ia   STA: A.A.37   TOP: Slope

313 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

314 ANS: 1

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

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

315 ANS: 4

$y = mx + b$

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

$b = -7$

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

316 ANS:

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

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

$4 = -6 + b$

$10 = b$

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

317 ANS: 1

$y = mx + b$

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

$b = 7$

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

318 ANS: 3

$y = mx + b$ $y = \dfrac{3}{4} x - \dfrac{1}{2}$

$1 = \left(\dfrac{3}{4}\right)(2) + b$ $4y = 3x - 2$

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

$b = -\dfrac{1}{2}$

PTS: 2   REF: 081219ia   STA: A.A.34   TOP: Writing Linear Equations

319 ANS: 1

$y = mx + b$

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

$b = -2$

PTS: 2   REF: 011406ia   STA: A.A.34   TOP: Writing Linear Equations

320 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

321 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

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

323 ANS: 3

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

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

$$3 = -2 + b$$

$$5 = b$$

PTS: 2   REF: 011013ia   STA: A.A.35   TOP: Writing Linear Equations

324 ANS: 2

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

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

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

325 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

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

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

327 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

328 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

329 ANS: 4

$$2(2) - (-7) = 11$$

PTS: 2　　　　REF: 081217ia　　STA: A.A.39　　TOP: Identifying Points on a Line

330 ANS: 3

$$2(5) + k = 9$$

$$10 + k = 9$$

$$k = -1$$

PTS: 2　　　　REF: 061304ia　　STA: A.A.39　　TOP: Identifying Points on a Line

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

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

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

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

335 ANS: 3　　　　PTS: 2　　　　REF: 011324ia　　STA: A.A.36
TOP: Parallel and Perpendicular Lines

336 ANS: 2　　　　PTS: 2　　　　REF: 061327ia　　STA: A.A.36
TOP: Parallel and Perpendicular Lines

337 ANS: 1

The slope of both is −4.

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

338 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

339 ANS: 1

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

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

340 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

341 ANS: 1

Using $m = -\dfrac{A}{B}$, the slope of $2x - 3y = 9$ is $\dfrac{2}{3}$.

PTS: 2   REF: 011322ia   STA: A.A.38   TOP: Parallel and Perpendicular Lines

342 ANS: 1
$m = -3$

PTS: 2   REF: 081307ia   STA: A.A.38   TOP: Parallel and Perpendicular Lines

343 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

344 ANS: 4
$-6x - 17 \ge 8x + 25$

$-42 \ge 14x$

$-3 \ge x$

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

345 ANS:

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

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

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

$7x \ge 21$

$x \ge 3$

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

346 ANS:
$-5(x - 7) < 15$

$x - 7 > -3$

$x > 4$

PTS: 2   REF: 061331ia   STA: A.A.24   TOP: Solving Inequalities

347 ANS: 1   PTS: 2   REF: 011418ia   STA: A.A.24
TOP: Solving Inequalities

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

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

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

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

350 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

351 ANS: 4
$$-2(x - 5) < 4$$
$$-2x + 10 < 4$$
$$-2x < -6$$
$$x > 3$$

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

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

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

353 ANS: 1

$-3x + 8 \geq 14$

$\qquad -3x \geq 6$

$\qquad x \leq -2$

PTS: 2 REF: 081309ia STA: A.A.21 TOP: Interpreting Solutions

354 ANS: 3 PTS: 2 REF: 081317ia STA: A.A.21
TOP: Interpreting Solutions

355 ANS: 1 PTS: 2 REF: 080803ia STA: A.A.4
TOP: Modeling Inequalities

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

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

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

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

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

361 ANS: 2 PTS: 2 REF: 081212ia STA: A.A.5
TOP: Modeling Inequalities

362 ANS: 4 PTS: 2 REF: 061321ia STA: A.A.5
TOP: Modeling Inequalities

363 ANS: 1 PTS: 2 REF: 011403ia STA: A.A.5
TOP: Modeling Inequalities

364 ANS:

7. $15x + 22 \geq 120$

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

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

365 ANS:

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

$\qquad d \geq 32.5$

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

366 ANS: 1

$0.07m + 19 \leq 29.50$

$\qquad 0.07m \leq 10.50$

$\qquad m \leq 150$

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

367 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

368 ANS:

$0.65x + 35 \le 45$

$0.65x \le 10$

$x \le 15$

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

369 ANS: 3

$5x < 55$

$x < 11$

PTS: 2 REF: 061211ia STA: A.A.6 TOP: Modeling Inequalities

370 ANS: 4

$375 + 155w \ge 900$

$155w \ge 525$

$w \ge 3.4$

PTS: 2 REF: 081206ia STA: A.A.6 TOP: Modeling Inequalities

371 ANS: 2

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

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

372 ANS: 1 PTS: 2 REF: 060920ia STA: A.G.6

TOP: Linear Inequalities

373 ANS:
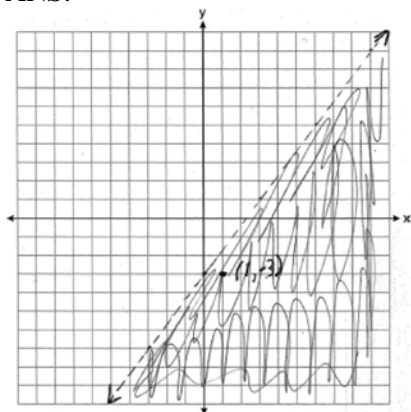
(1, −3) is in the solution set. 4(1) − 3(−3) > 9

$$4 + 9 > 9$$

PTS: 4   REF: 011038ia   STA: A.G.6   TOP: Linear Inequalities
374 ANS: 4   PTS: 2   REF: 061028ia   STA: A.G.6
TOP: Linear Inequalities
375 ANS: 1   PTS: 2   REF: 011210ia   STA: A.G.6
TOP: Linear Inequalities
376 ANS: 4   PTS: 2   REF: 061320ia   STA: A.G.6
TOP: Linear Inequalities
377 ANS: 2   PTS: 2   REF: 081314ia   STA: A.G.6
TOP: Linear Inequalities
378 ANS: 3
$y > 2x − 3$

PTS: 2   REF: 011422ia   STA: A.G.6   TOP: Linear Inequalities
379 ANS: 3   PTS: 2   REF: 011117ia   STA: A.G.4
TOP: Graphing Absolute Value Functions
380 ANS:
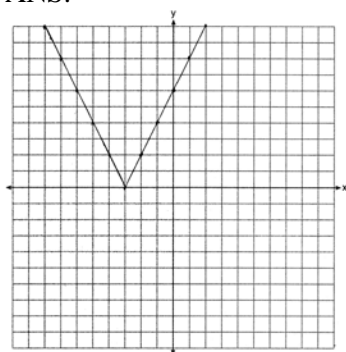
PTS: 2   REF: 011333ia   STA: A.G.4   TOP: Graphing Absolute Value Functions
381 ANS: 4
The transformation is a reflection in the *x*-axis.

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

382 ANS: 3   PTS: 2   REF: 011017ia   STA: A.G.5
     TOP: Graphing Absolute Value Functions

383 ANS:
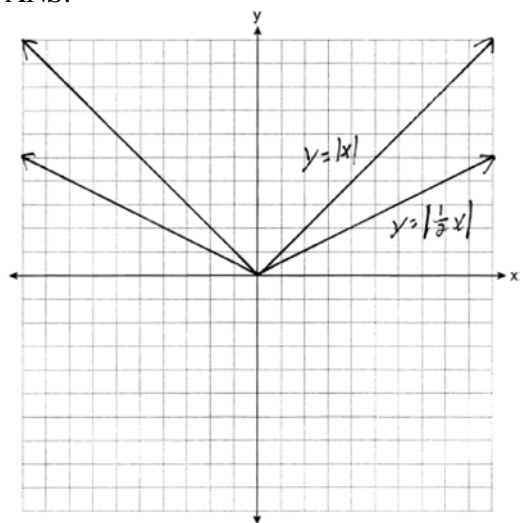
. Graph becomes wider as the coefficient approaches 0.

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

384 ANS:
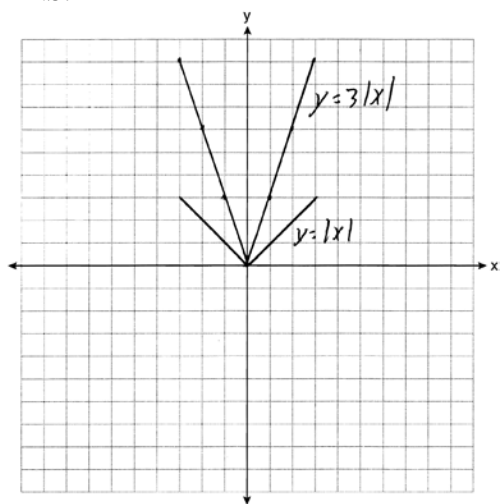
The graph becomes steeper.

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

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

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

386 ANS:
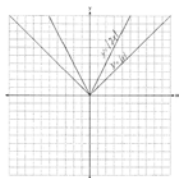
. Graph becomes narrower as the coefficient increases.

PTS: 3   REF: 011434ia   STA: A.G.5   TOP: Graphing Absolute Value Functions

387 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

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

389 ANS: 2   PTS: 2   REF: 061105ia   STA: A.A.20
TOP: Factoring Polynomials

390 ANS: 4

$3x^3 - 33x^2 + 90x = 3x(x^2 - 11x + 30) = 3x(x - 5)(x - 6)$

PTS: 2   REF: 061227ia   STA: A.A.20   TOP: Factoring Polynomials

391 ANS:

$5x^3 - 20x^2 - 60x$

$5x(x^2 - 4x - 12)$

$5x(x + 2)(x - 6)$

PTS: 2   REF: 011332ia   STA: A.A.20   TOP: Factoring Polynomials

392 ANS: 3
$3mn(m + 4n)$

PTS: 2   REF: 011402ia   STA: A.A.20   TOP: Factoring Polynomials

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

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

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

396 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

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

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

399 ANS: 3   PTS: 2   REF: 081008ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares
400 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
401 ANS: 3   PTS: 2   REF: 061101ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares
402 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
403 ANS: 2   PTS: 2   REF: 011201ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares
404 ANS: 3   PTS: 2   REF: 081207ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares
405 ANS: 1   PTS: 2   REF: 011306ia   STA: A.A.19
    TOP: Factoring the Difference of Perfect Squares
406 ANS: 3

$x^2 - 6x = 0$

$x(x - 6) = 0$

$x = 0 \; x = 6$

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

$x^2 - 16x + 28 = 0$

$(x - 14)(x - 2) = 0$

$x = 14, 2$

    PTS: 2   REF: 061311ia   STA: A.A.27   TOP: Solving Quadratics by Factoring
408 ANS: 3

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

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

$x = 7 \; x = 3$

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

409 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

410 ANS:

–2, 3. $x^2 - x = 6$

$x^2 - x - 6 = 0$

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

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

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

411 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

412 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

413 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

414 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

415 ANS: 4

$x^2 - 14x + 48 = 0$

$(x - 6)(x - 8) = 0$

$x = 6, 8$

PTS: 2   REF: 011320ia   STA: A.A.28   TOP: Roots of Quadratics
416 ANS: 2   PTS: 2   REF: 061326ia   STA: A.A.28
TOP: Roots of Quadratics
417 ANS: 4

$2x^2 - 8x = 0$

$2x(x - 4) = 0$

$x = 0, 4$

PTS: 2   REF: 011427ia   STA: A.A.28   TOP: Roots of Quadratics
418 ANS: 4   PTS: 2   REF: 060829ia   STA: A.G.5
TOP: Graphing Quadratic Functions
419 ANS: 1   PTS: 2   REF: 081015ia   STA: A.G.5
TOP: Graphing Quadratic Functions
420 ANS: 2   PTS: 2   REF: 061113ia   STA: A.G.5
TOP: Graphing Quadratic Functions
421 ANS: 2   PTS: 2   REF: 081218ia   STA: A.G.5
TOP: Graphing Quadratic Functions
422 ANS: 2   PTS: 2   REF: 011330ia   STA: A.G.5
TOP: Graphing Quadratic Functions
423 ANS: 4   PTS: 2   REF: 081322ia   STA: A.G.5
TOP: Graphing Quadratic Functions
424 ANS:
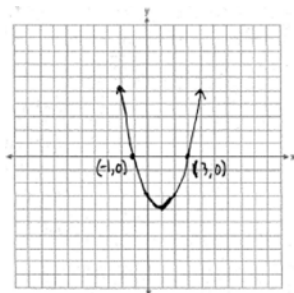
PTS: 3   REF: 060836ia   STA: A.G.8   TOP: Solving Quadratics by Graphing
425 ANS: 3   PTS: 2   REF: 060924ia   STA: A.G.8
TOP: Solving Quadratics by Graphing
426 ANS: 2   PTS: 2   REF: 080916ia   STA: A.G.8
TOP: Solving Quadratics by Graphing
427 ANS: 4   PTS: 2   REF: 011111ia   STA: A.G.8
TOP: Solving Quadratics by Graphing

428 ANS:
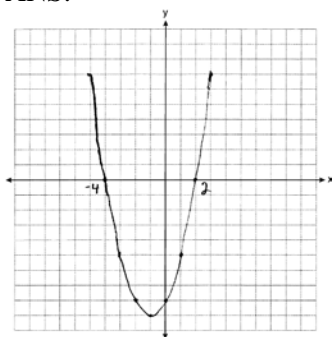
PTS: 3   REF: 061234ia   STA: A.G.8   TOP: Solving Quadratics by Graphing

429 ANS: 3   PTS: 2   REF: 061306ia   STA: A.G.8

     TOP: Solving Quadratics by Graphing

430 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

431 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

432 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

433 ANS: 3

$N = 5 + J$ $N(N - 5) = 84$

$J = N - 5$ $N^2 - 5N - 84 = 0$

$NJ = 84$ $(N - 12)(N + 7) = 0$

$N = 12$

PTS: 2   REF: 081304ia   STA: A.A.8   TOP: Writing Quadratics

434 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

435 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

436 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

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

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

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

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

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

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

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

443 ANS: 2   PTS: 2   REF: 081111ia   STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

444 ANS: 4   PTS: 2   REF: 081214ia   STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

445 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

446 ANS:

$(-2, 11).$
$$x = \frac{-b}{2a} = \frac{-(-8)}{2(-2)} = -2$$
$$y = -2(-2)^2 - 8(-2) + 3 = 11$$

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

447 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

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

PTS: 2   REF: 011127ia   STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

449 ANS: 1
$$x = \frac{-b}{2a} = \frac{-(-3)}{2(2)} = \frac{3}{4}.$$

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

450 ANS: 3
$$x = \frac{-b}{2a} = \frac{-24}{2(-2)} = 6. \quad y = -2(6)^2 + 24(6) - 100 = -28$$

PTS: 2   REF: 061214ia   STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

451 ANS: 3

$x = \dfrac{-b}{2a} = \dfrac{-8}{2(1)} = -4.$ $y = (-4)^2 + 8(-4) + 10 = -6.$ $(-4, -6)$

PTS: 2 REF: 011314ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

452 ANS: 1

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

PTS: 2 REF: 011416ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

453 ANS: 3

$5x + 2y = 48$

$3x + 2y = 32$

$2x = 16$

$x = 8$

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

454 ANS:

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

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

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

$ x = -2$

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

455 ANS: 2

$x + 2y = 9$

$x - y = 3$

$3y = 6$

$y = 2$

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

456 ANS: 1

$x - 2y = 1$

$x + 4y = 7$

$-6y = -6$

$y = 1$

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

457 ANS: 3

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

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

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

$\qquad d = 2$

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

458 ANS: 2

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

$2x + y = 8$

$2x - 6y = -6$

$\qquad 7y = 14$

$\qquad y = 2$

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

459 ANS: 3

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

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

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

$\qquad y = -1$

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

460 ANS:

2. Subtracting the equations: $3y = 6$

$\qquad\qquad\qquad y = 2$

PTS: 2 REF: 061231ia STA: A.A.10 TOP: Solving Linear Systems

461 ANS: 1 PTS: 2 REF: 081315ia STA: A.A.10

TOP: Solving Linear Systems

462 ANS: 2

$2x + 3y = 7$

$3x + 3y = 9$

$\quad x = 2$

PTS: 2 REF: 011410ia STA: A.A.10 TOP: Solving Linear Systems

26

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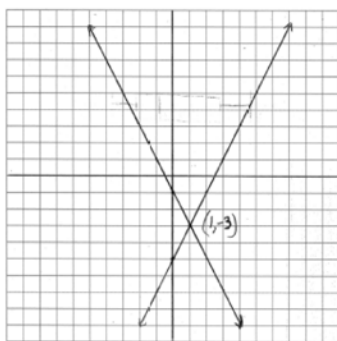
PTS: 4   REF: 080938ia   STA: A.G.7   TOP: Solving Linear Systems

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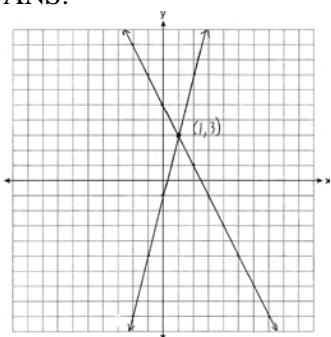
PTS: 3   REF: 011235ia   STA: A.G.7   TOP: Solving Linear Systems

465 ANS: 3   PTS: 2   REF: 081201ia   STA: A.G.7
TOP: Solving Linear Systems

466 ANS: 3   PTS: 2   REF: 011304ia   STA: A.G.7
TOP: Solving Linear Systems

467 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

468 ANS: 3

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

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

$r = 84 - 2r + 3$

$3r = 87$

$r = 29$

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

469 ANS: 2

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

$o = 2s$ $s = 42$

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

470 ANS:

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

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

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

$m = \$0.50$

PTS: 4   REF: 080837ia   STA: A.A.7   TOP: Writing Linear Systems

471 ANS: 2

$L + S = 47$

$L - S = 15$

$2L = 62$

$L = 31$

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

472 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

473 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

474 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

475 ANS: 1

$f + m = 53$

$f - m = 25$

$ 2m = 28$

$ m = 14$

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

476 ANS: 1

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

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

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

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

477 ANS: 2

$W + L = 72$

$W - L = 12$

$ 2W = 84$

$ W = 42$

PTS: 2 REF: 081227ia STA: A.A.7 TOP: Writing Linear Systems

478 ANS:

$3n + 4p = 8.50 \quad . \quad 3(2.50) + 4p = 8.50$

$5n + 8p = 14.50 \qquad\qquad 4p = 1$

$6n + 8p = 17 \qquad\qquad\quad p = 0.25$

$ n = 2.50$

PTS: 3 REF: 011335ia STA: A.A.7 TOP: Writing Linear Systems

479 ANS:

$L - S = 28 \qquad . \quad 2S - 8 = S + 28$

$ L = 2S - 8 \qquad S = 36$

$ L = S + 28 \qquad L = 36 + 28 = 64$

PTS: 3 REF: 081335ia STA: A.A.7 TOP: Writing Linear Systems

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

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

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

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

484 ANS: 4   PTS: 2   REF: 061222ia   STA: A.A.40
     TOP: Systems of Linear Inequalities

485 ANS: 2

$-1 \le 3(2) + 1.$ $2 - (-1) > 1$

$-1 \le 7$ $3 > 1$

     PTS: 2   REF: 011323ia   STA: A.A.40   TOP: Systems of Linear Inequalities

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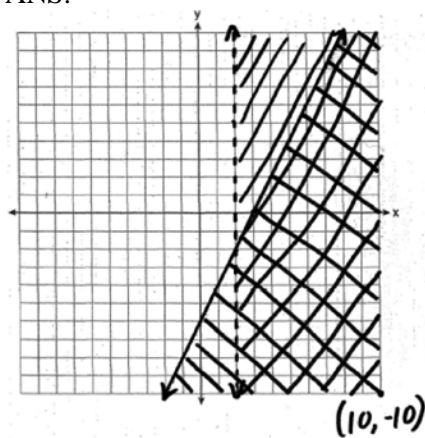
     PTS: 4   REF: 010938ia   STA: A.G.7   TOP: Systems of Linear Inequalities

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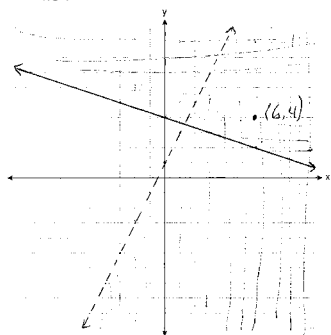
     PTS: 4   REF: 081037ia   STA: A.G.7   TOP: Systems of Linear Inequalities

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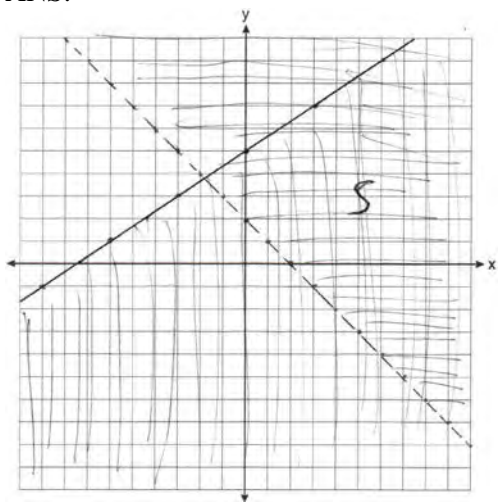
PTS: 4   REF: 011139ia   STA: A.G.7   TOP: Systems of Linear Inequalities

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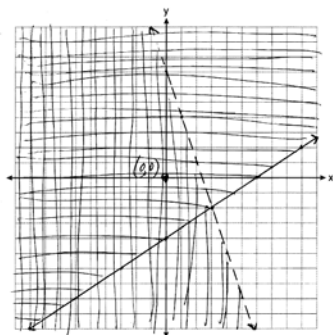
PTS: 4   REF: 061139ia   STA: A.G.7   TOP: Systems of Linear Inequalities

490 ANS:
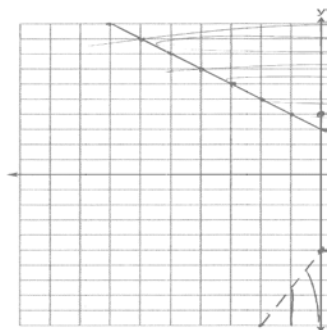
PTS: 4   REF: 081239ia   STA: A.G.7   TOP: Systems of Linear Inequalities

491 ANS: 4
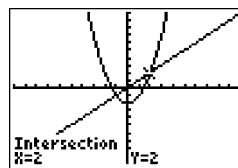
$x^2 - 2 = x$ Since $y = x$, the solutions are $(2, 2)$ and $(-1, -1)$.

$x^2 - x - 2 = 0$

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

$x = 2$ or -1

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

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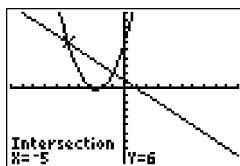
$x^2 + 5x + 6 = -x + 1$. $y = -x + 1$

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

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

$x = -5$ or -1

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

493 ANS: 2
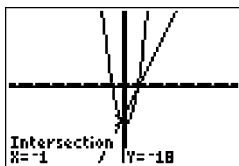
$x^2 - x - 20 = 3x - 15$. $y = 3x - 15$.

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

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

$x = 5$ or -1

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

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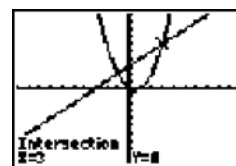
$x^2 - x = x + 3$. Since $y = x + 3$, the solutions are $(3, 6)$ and $(-1, 2)$.

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

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

$x = 3$ or -1

PTS: 2   REF: 061118ia   STA: A.A.11   TOP: Quadratic-Linear Systems

495 ANS: 2
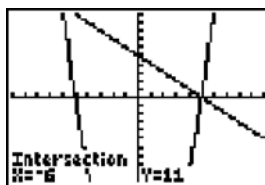
$y = -x + 5.$ $-x + 5 = x^2 - 25$. $y = -(-6) + 5 = 11.$

$0 = x^2 + x - 30$ $y = -5 + 5 = 0$

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

$x = -6, 5$

PTS: 2   REF: 061213ia   STA: A.A.11   TOP: Quadratic-Linear Systems

496 ANS:

$(-3, -5), (3, 7).$ $x^2 + 2x - 8 = 2x + 1.$ $y = 2(3) + 1 = 7$

$x^2 - 9 = 0$ $y = 2(-3) + 1 = -5$

$x = \pm 3$

PTS: 3   REF: 081236ia   STA: A.A.11   TOP: Quadratic-Linear Systems

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic
Answer Section

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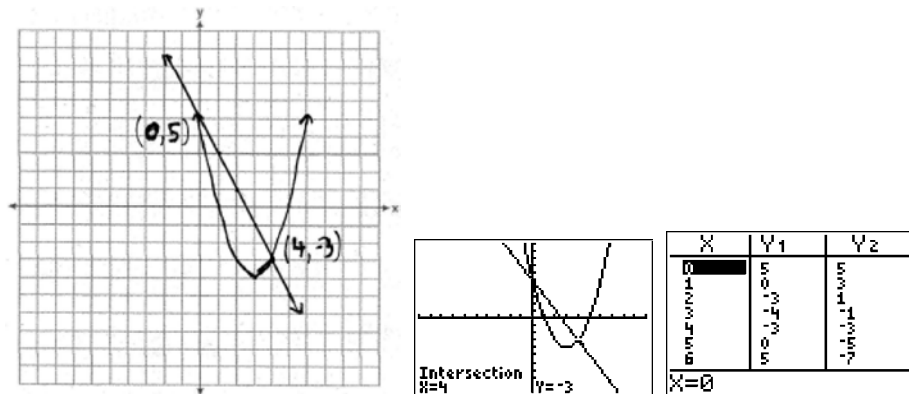
PTS: 4   REF: fall0738ia   STA: A.G.9   TOP: Quadratic-Linear Systems

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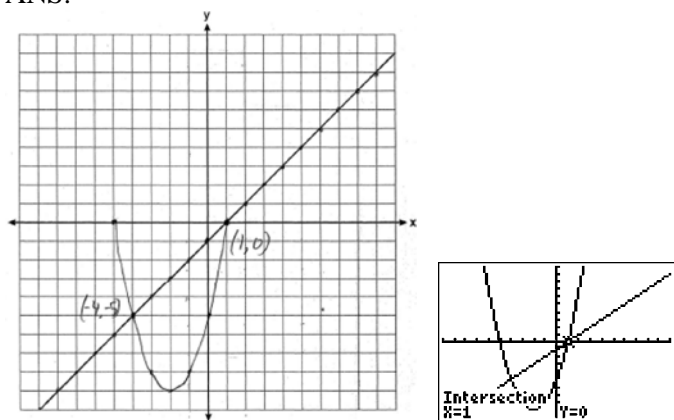
PTS: 4   REF: 080839ia   STA: A.G.9   TOP: Quadratic-Linear Systems

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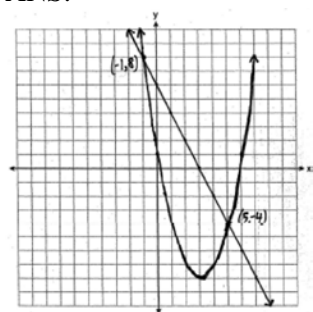
PTS: 4   REF: 060939ia   STA: A.G.9   TOP: Quadratic-Linear Systems

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

501   ANS:
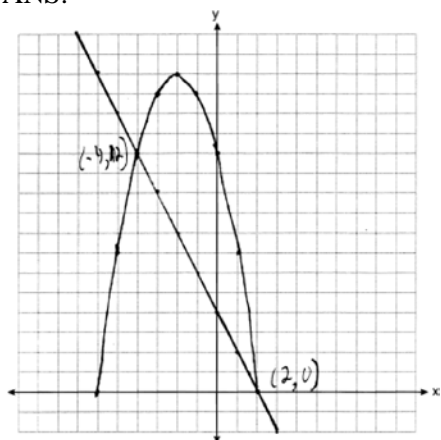
　　PTS:　4　　　　　　REF:　061039ia　　　STA:　A.G.9　　　TOP:　Quadratic-Linear Systems
502   ANS:　1

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

　　$2y = 2x + 10$

　　　$y = x + 5$

　　PTS:　2　　　　　　REF:　081010ia　　　STA:　A.G.9　　　TOP:　Quadratic-Linear Systems
503   ANS:　4　　　　　　PTS:　2　　　　　　REF:　011102ia　　　STA:　A.G.9
　　TOP:　Quadratic-Linear Systems
504   ANS:
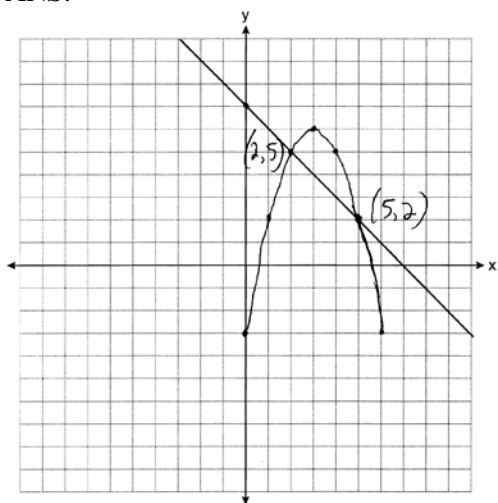
　　PTS:　4　　　　　　REF:　081138ia　　　STA:　A.G.9　　　TOP:　Quadratic-Linear Systems
505   ANS:　1　　　　　　PTS:　2　　　　　　REF:　011207ia　　　STA:　A.G.9
　　TOP:　Quadratic-Linear Systems

2

506 ANS:
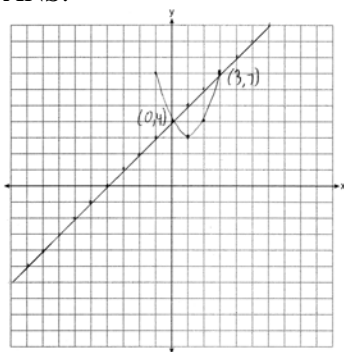
PTS: 4 REF: 011339ia STA: A.G.9 TOP: Quadratic-Linear Systems

507 ANS: 1

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

$x^2 - 6x + 9 = 0$

$(x - 3)^2 = 0$

$x = 3$

PTS: 2 REF: 061330ia STA: A.G.9 TOP: Quadratic-Linear Systems

508 ANS:
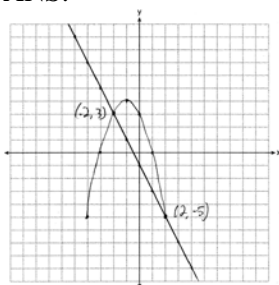
PTS: 4 REF: 081337ia STA: A.G.9 TOP: Quadratic-Linear Systems

509 ANS:
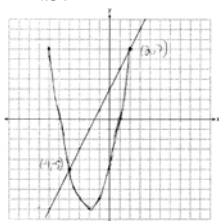
PTS: 4 REF: 011437ia STA: A.G.9 TOP: Quadratic-Linear Systems

510 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

511 ANS: 3 PTS: 2 REF: 080819ia STA: A.A.13

TOP: Addition and Subtraction of Polynomials KEY: subtraction

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

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

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

515 ANS: 4   PTS: 2   REF: 061130ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: subtraction

516 ANS: 1   PTS: 2   REF: 011213ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: addition

517 ANS: 4   PTS: 2   REF: 061226ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: subtraction

518 ANS: 2   PTS: 2   REF: 081205ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: addition

519 ANS: 1   PTS: 2   REF: 061322ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: subtraction

520 ANS: 1   PTS: 2   REF: 081302ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: addition

521 ANS: 4   PTS: 2   REF: 011429ia   STA: A.A.13
TOP: Addition and Subtraction of Polynomials   KEY: subtraction

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

523 ANS: 3

$$(3x + 2)(x - 7) = 3x^2 - 21x + 2x - 14 = 3x^2 - 19x - 14$$

PTS: 2   REF: 061210ia   STA: A.A.13   TOP: Multiplication of Polynomials

524 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

525 ANS:

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

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

526 ANS: 4   PTS: 2   REF: 061203ia   STA: A.A.14
TOP: Division of Polynomials

527 ANS: 2   PTS: 2   REF: 011316ia   STA: A.A.14
TOP: Division of Polynomials

528 ANS: 4   PTS: 2   REF: 011412ia   STA: A.A.14
TOP: Division of Polynomials

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

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

531 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

532 ANS: 4

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

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

533 ANS:

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

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

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

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

536 ANS: 1 PTS: 2 REF: 061103ia STA: A.A.12
TOP: Division of Powers

537 ANS: 3

$$\frac{3^6}{3^1} = 3^5$$

PTS: 2 REF: 061219ia STA: A.A.12 TOP: Division of Powers

538 ANS: 2 PTS: 2 REF: 081311ia STA: A.A.12
TOP: Division of Powers

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

540 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

541 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

542 ANS: 2 PTS: 2 REF: 061312ia STA: A.A.12
TOP: Powers of Powers

543 ANS: 2 PTS: 2 REF: 081318ia STA: A.A.12
TOP: Powers of Powers

544 ANS: 2 PTS: 2 REF: fall0725ia STA: A.N.4
TOP: Operations with Scientific Notation
545 ANS: 4 PTS: 2 REF: 010927ia STA: A.N.4
TOP: Operations with Scientific Notation
546 ANS: 4 PTS: 2 REF: 060927ia STA: A.N.4
TOP: Operations with Scientific Notation
547 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
548 ANS: 2 PTS: 2 REF: 061127ia STA: A.N.4
TOP: Operations with Scientific Notation
549 ANS:
6.56×10^{-2}

PTS: 2 REF: 081231ia STA: A.N.4 TOP: Operations with Scientific Notation
550 ANS: 3 PTS: 2 REF: 011319ia STA: A.N.4
TOP: Operations with Scientific Notation
551 ANS: 3
$35000(1 - 0.05)^4 \approx 28507.72$

PTS: 2 REF: fall0719ia STA: A.A.9 TOP: Exponential Functions
552 ANS: 2 PTS: 2 REF: 060830ia STA: A.A.9
TOP: Exponential Functions
553 ANS: 4 PTS: 2 REF: 010908ia STA: A.A.9
TOP: Exponential Functions
554 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
555 ANS: 3
$500(1 + 0.06)^3 \approx 596$

PTS: 2 REF: 080929ia STA: A.A.9 TOP: Exponential Functions
556 ANS: 2
$R = 0.5^{d-1}$

PTS: 2 REF: 011006ia STA: A.A.9 TOP: Exponential Functions
557 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

558 ANS:
24,435.19. $30000(.95)^4 \approx 24435.19$

PTS: 4   REF: 011138ia   STA: A.A.9   TOP: Exponential Functions
559 ANS: 2
$20000(.88)^3 = 13629.44$

PTS: 2   REF: 061124ia   STA: A.A.9   TOP: Exponential Functions
560 ANS: 2
$2000(1 + 0.04)^3 \approx 2249$

PTS: 2   REF: 081124ia   STA: A.A.9   TOP: Exponential Functions
561 ANS: 1   PTS: 2   REF: 011202ia   STA: A.A.9
TOP: Exponential Functions
562 ANS: 2   PTS: 2   REF: 061229ia   STA: A.A.9
TOP: Exponential Functions
563 ANS: 3   PTS: 2   REF: 081211ia   STA: A.A.9
TOP: Exponential Functions
564 ANS: 3   PTS: 2   REF: 011310ia   STA: A.A.9
TOP: Exponential Functions
565 ANS:
$A = P(1 + R)^t = 2000(1 + 0.035)^4 \approx 2295$

PTS: 2   REF: 081333ia   STA: A.A.9   TOP: Exponential Functions
566 ANS:
$1000(1.03)^5 \approx 1159.27$

PTS: 3   REF: 011433ia   STA: A.A.9   TOP: Exponential Functions
567 ANS:
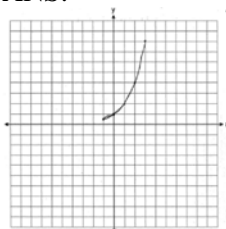
. The graph will never intersect the *x*-axis as $2^x > 0$ for all values of *x*.

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

568 ANS:
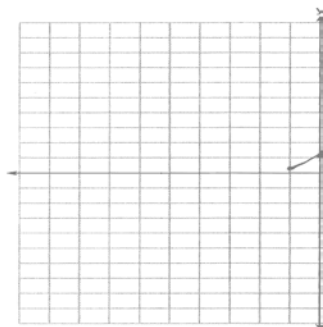
PTS: 2   REF: 081233ia   STA: A.G.4   TOP: Graphing Exponential Functions

569 ANS: 4   PTS: 2   REF: 011423ia   STA: A.G.4
TOP: Graphing Exponential Functions

570 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

571 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

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

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

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

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

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

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

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

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

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

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

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

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

578 ANS:
$4\sqrt{75} = 4\sqrt{25}\sqrt{3} = 20\sqrt{3}$

PTS: 2   REF: 011331ia   STA: A.N.2   TOP: Simplifying Radicals

579 ANS:
$2\sqrt{108} = 2\sqrt{36}\sqrt{3} = 12\sqrt{3}$

PTS: 2   REF: 081332ia   STA: A.N.2   TOP: Simplifying Radicals

580 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

581 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

582 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

583 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

584 ANS:
$-2\sqrt{3}$ $\dfrac{16\sqrt{21}}{2\sqrt{7}} - 5\sqrt{12} = 8\sqrt{3} - 5\sqrt{4}\sqrt{3} = 8\sqrt{3} - 10\sqrt{3} = -2\sqrt{3}$

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

585 ANS:
$6\sqrt{3}$ $\dfrac{3\sqrt{75} + \sqrt{27}}{3} = \dfrac{3\sqrt{25}\sqrt{3} + \sqrt{9}\sqrt{3}}{3} = \dfrac{15\sqrt{3} + 3\sqrt{3}}{3} = \dfrac{18\sqrt{3}}{3} = 6\sqrt{3}$

PTS: 3   REF: 061236ia   STA: A.N.3   TOP: Operations with Radicals

586 ANS:

$5 - 2\sqrt{3} + \sqrt{9}\sqrt{3} + 2(3) = 5 - 2\sqrt{3} + 3\sqrt{3} + 6 = 11 + \sqrt{3}$

PTS: 3   REF: 061336ia   STA: A.N.3   TOP: Operations with Radicals

587 ANS:

$\dfrac{\sqrt{84}}{2\sqrt{3}} = \dfrac{\sqrt{4}\sqrt{21}}{2\sqrt{3}} = \sqrt{\dfrac{21}{3}} = \sqrt{7}$

PTS: 2   REF: 011431ia   STA: A.N.3   TOP: Operations with Radicals
KEY: division

588 ANS: 2

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

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

589 ANS: 2

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

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

590 ANS: 4

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

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

591 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: $a > 0$

592 ANS: 1

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

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

593 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: $a > 0$

594 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: $a > 0$

595 ANS: 2

$$\frac{x^2 - 3x - 10}{x^2 - 25} = \frac{(x - 5)(x + 2)}{(x + 5)(x - 5)} = \frac{x + 2}{x + 5}$$

PTS: 2 REF: 061216ia STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$

596 ANS: 4

$$\frac{2x^2(x^4 - 9x^2 + 1)}{2x^2}$$

PTS: 2 REF: 081222ia STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$

597 ANS: 1

$$\frac{2x^2 + 10x - 28}{4x + 28} = \frac{2(x^2 + 5x - 14)}{4x + 28} = \frac{2(x + 7)(x - 2)}{4(x + 7)} = \frac{x - 2}{2}$$

PTS: 2 REF: 011327ia STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$

598 ANS: 1

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

PTS: 2 REF: 0613071a STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$

599 ANS: 3

$$\frac{x^2 - 25}{x^2 - x - 20} = \frac{(x + 5)(x - 5)}{(x + 4)(x - 5)} = \frac{x + 5}{x + 4}$$

PTS: 2 REF: 011424ia STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$

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

601 ANS: 3   PTS: 2   REF: 060817ia   STA: A.A.15
TOP: Undefined Rationals
602 ANS: 2   PTS: 2   REF: 010925ia   STA: A.A.15
TOP: Undefined Rationals
603 ANS: 4   PTS: 2   REF: 060916ia   STA: A.A.15
TOP: Undefined Rationals
604 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
605 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
606 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
607 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
608 ANS: 3

$x^2 - 4 = 0$

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

$x = \pm 2$

PTS: 2   REF: 081225ia   STA: A.A.15   TOP: Undefined Rationals
609 ANS: 1   PTS: 2   REF: 061315ia   STA: A.A.15
TOP: Undefined Rationals

610 ANS: 4

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

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

$x = -3, 5$

PTS: 2   REF: 081316ia   STA: A.A.15   TOP: Undefined Rationals

611 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

612 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

613 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

614 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

615 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

616 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

617 ANS:

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

PTS: 2   REF: 081232ia   STA: A.A.18   TOP: Multiplication and Division of Rationals
KEY: multiplication

618 ANS:

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

PTS: 4   REF: 081338ia   STA: A.A.18   TOP: Multiplication and Division of Rationals
KEY: division

619 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

620 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

621 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

622 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

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

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

625 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

626 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

14

627 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

628 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

629 ANS: 1   PTS: 2   REF: 061220ia   STA: A.A.17
TOP: Addition and Subtraction of Rationals

630 ANS: 3

$$\frac{4}{3a} - \frac{5}{2a} = \frac{8}{6a} - \frac{15}{6a} = -\frac{7}{6a}$$

PTS: 2   REF: 081328ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

631 ANS: 3

$$\frac{2n}{5} + \frac{3n}{2} = \frac{4n + 15n}{10} = \frac{19n}{10}$$

PTS: 2   REF: 011420ia   STA: A.A.17   TOP: Addition and Subtraction of Rationals

632 ANS:

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

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

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

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

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

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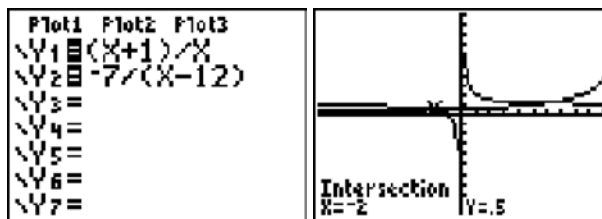
PTS: 4   REF: fall0739ia   STA: A.A.26   TOP: Solving Rationals

633 ANS: 4
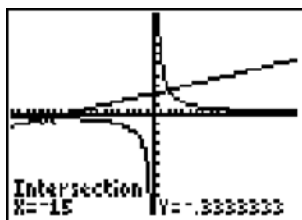
$$\frac{5}{x} = \frac{x+13}{6}$$

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

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

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

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

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

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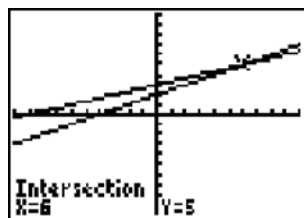
$$\frac{k+4}{2} = \frac{k+9}{3}$$

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

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

$$k = 6$$

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

635 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

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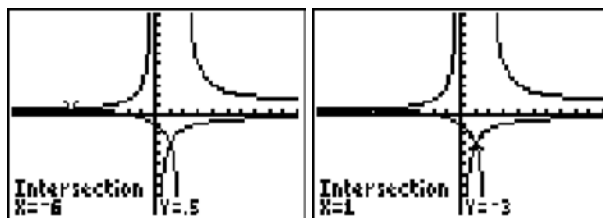
$$\frac{x+2}{x-2} = \frac{-3}{x}$$

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

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

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

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

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

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

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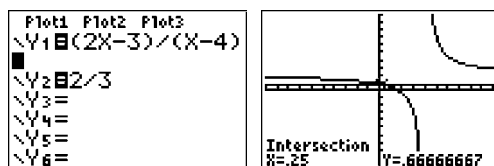
$$\frac{2x-3}{x-4} = \frac{2}{3}$$

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

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

$$4x = 1$$

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

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

638 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

639 ANS:

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

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

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

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

$$16x = -36$$

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

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

640 ANS: 3

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

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

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

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

$$x = -3, 1$$

PTS: 2   REF: 081226ia   STA: A.A.26   TOP: Solving Rationals

641 ANS: 2

$$\dfrac{x+2}{2} = \dfrac{4}{x}$$

$$x^2 + 2x = 8$$

$$x^2 + 2x - 8 = 0$$

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

$$x = -4, 2$$

PTS: 2   REF: 061317ia   STA: A.A.26   TOP: Solving Rationals

642 ANS:

$$\dfrac{2}{3x} + \dfrac{12}{3x} = \dfrac{7}{x+1}$$

$$\dfrac{14}{3x} = \dfrac{7}{x+1}$$

$$21x = 14x + 14$$

$$7x = 14$$

$$x = 2$$

PTS: 4   REF: 061337ia   STA: A.A.26   TOP: Solving Rationals

643 ANS:

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

$$3x^2 - 24 = 2x^2 + 10x$$

$$x^2 - 10x + 24 = 0$$

$$(x - 12)(x + 2) = 0$$

$$x = 12, -2$$

PTS: 4   REF: 011438ia   STA: A.A.26   TOP: Solving Rationals

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

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

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

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

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

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

650 ANS: 3   PTS: 2   REF: 061318ia   STA: A.G.4
TOP: Families of Functions

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

652 ANS: 4   PTS: 2   REF: 061221ia   STA: A.G.4
TOP: Identifying the Equation of a Graph

653 ANS: 4   PTS: 2   REF: fall0730ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs

654 ANS: 4   PTS: 2   REF: 010930ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs

655 ANS: 3   PTS: 2   REF: 060919ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs

656 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
KEY: ordered pairs

657 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
KEY: ordered pairs

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

659 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
KEY: ordered pairs
660 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
KEY: ordered pairs
661 ANS: 3   PTS: 2   REF: 011204ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs
662 ANS: 1   PTS: 2   REF: 061209ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs
663 ANS: 3   PTS: 2   REF: 011309ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs
664 ANS: 3   PTS: 2   REF: 081308ia   STA: A.G.3
TOP: Defining Functions   KEY: graphs
665 ANS: 4
An element of the domain, 1, is paired with two different elements of the range, 1 and −1.

PTS: 2   REF: 011405ia   STA: A.G.3   TOP: Defining Functions
KEY: ordered pairs
666 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
667 ANS: 3   PTS: 2   REF: 060825ia   STA: A.A.45
TOP: Pythagorean Theorem
668 ANS: 4
$16^2 + b^2 = 34^2$

$$b^2 = 900$$
$$b = 30$$

PTS: 2   REF: 080809ia   STA: A.A.45   TOP: Pythagorean Theorem
669 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

670 ANS: 1
$$8^2 + 15^2 = c^2$$
$$c^2 = 289$$
$$c = 17$$

PTS: 2   REF: 080906ia   STA: A.A.45   TOP: Pythagorean Theorem
671 ANS: 2
$$\sqrt{5^2 + 7^2} \approx 8.6$$

PTS: 2   REF: 081004ia   STA: A.A.45   TOP: Pythagorean Theorem
672 ANS: 2
$$\sqrt{18.4^2 - 7^2} \approx 17$$

PTS: 2   REF: 011107ia   STA: A.A.45   TOP: Pythagorean Theorem
673 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
674 ANS: 1
$$\sqrt{1700^2 - 1300^2} \approx 1095$$

PTS: 2   REF: 011221ia   STA: A.A.45   TOP: Pythagorean Theorem
675 ANS: 2
$$13^2 + 13^2 = x^2$$
$$338 = x^2$$
$$\sqrt{338} = x$$
$$18 \approx x$$

PTS: 2   REF: 061223ia   STA: A.A.45   TOP: Pythagorean Theorem
676 ANS: 3
$$\sqrt{8^2 - 6^2} = \sqrt{28} = \sqrt{4}\sqrt{7} = 2\sqrt{7}$$

PTS: 2   REF: 061329ia   STA: A.A.45   TOP: Pythagorean Theorem
677 ANS: 3
$$\sqrt{13^2 - 7^2} = \sqrt{120}$$

PTS: 2   REF: 081323ia   STA: A.A.45   TOP: Pythagorean Theorem

678 ANS: 2

$$\sqrt{48^2 + 40^2} = \sqrt{2304 + 1600} = \sqrt{3904} \approx 62$$

PTS: 2   REF: 011417ia   STA: A.A.45   TOP: Pythagorean Theorem

679 ANS: 1

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

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

680 ANS: 2

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

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

681 ANS: 3

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

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

682 ANS: 2

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

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

683 ANS: 2

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

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

684 ANS: 1

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

PTS: 2   REF: 011109ia   STA: A.A.42   TOP: Trigonometric Ratios

685 ANS: 2

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

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

686 ANS: 3

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

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

687 ANS: 4

If $m\angle C = 90$, then $\overline{AB}$ is the hypotenuse, and the triangle is a 3-4-5 triangle.

PTS: 2   REF: 061224ia   STA: A.A.42   TOP: Trigonometric Ratios

688 ANS: 2

$\cos x = \dfrac{\text{adjacent}}{\text{hypotenuse}} = \dfrac{16}{20}$

PTS: 2   REF: 011307ia   STA: A.A.42   TOP: Trigonometric Ratios

689 ANS: 1

$\cos A = \dfrac{\text{adjacent}}{\text{hypotenuse}} = \dfrac{3}{5}$

PTS: 2   REF: 081329ia   STA: A.A.42   TOP: Trigonometric Ratios

690 ANS: 3

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

$x \approx 21$

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

691 ANS:

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

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

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

692 ANS: 2

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

$x \approx 15.6$

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

693 ANS:

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

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

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

694 ANS:

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

$\; x \approx 2.1$

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

695 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

696 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

697 ANS:

$$\tan 48 = \frac{9}{x}. \quad \sin 48 = \frac{9}{y}$$

$$x \approx 8 \qquad y \approx 12$$

PTS: 4   REF: 011338ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side

698 ANS:

$$\tan 38 = \frac{opp}{80}$$

$$opp = 80 \tan 38 \approx 62.5$$

PTS: 3   REF: 011436ia   STA: A.A.44   TOP: Using Trigonometry to Find a Side

699 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

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

701 ANS: 3

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

$$A \approx 38.7$$

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

702 ANS:

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

$$A \approx 53$$

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

703 ANS:

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

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

$x \approx 37$

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

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

705 ANS:

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

$A \approx 41.8$

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

706 ANS:

78. $\cos x = \dfrac{6}{28}$

$x \approx 78$

PTS: 3   REF: 061235ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

707 ANS:

54, 23. $\cos A = \dfrac{17}{29}$. $\sqrt{29^2 - 17^2} \approx 23$

$x \approx 54$

PTS: 4   REF: 081238ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

708 ANS: 4

$\sin D = \dfrac{\text{opposite}}{\text{hypotenuse}} = \dfrac{12}{13}$

PTS: 2   REF: 061325ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

709 ANS:

$\tan x = \dfrac{350}{1000}$

$x \approx 19$

PTS: 3   REF: 061335ia   STA: A.A.43   TOP: Using Trigonometry to Find an Angle

710 ANS:

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

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

711 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

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

713 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

714 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 $\frac{3}{4} \times 16$. 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
KEY: area

715 ANS: 1   PTS: 2   REF: 080924ia   STA: A.G.1
TOP: Compositions of Polygons and Circles   KEY: perimeter

716 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

717 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
KEY: area

718 ANS: 2

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

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

719 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

720 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

721 ANS: 1

$$4 + 6 + 10 + \frac{6\pi}{2} = 20 + 3\pi$$

PTS: 2   REF: 081228ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
KEY: perimeter

722 ANS: 3   PTS: 2   REF: 011315ia   STA: A.G.1
TOP: Compositions of Polygons and Circles   KEY: area

723 ANS:

Area of rectangle minus area of semicircle: $(5 + 6 + 5) \times 5 - \frac{\pi \times 3^2}{2} \approx 65.86$

PTS: 4   REF: 061339ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
KEY: area

724 ANS: 1
$4(5 + 5) + 10\pi = 40 + 10\pi$

PTS: 2   REF: 081326ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
KEY: perimeter

725 ANS: 2

$$6^2 - \frac{(3)^2 \pi}{2}$$

PTS: 2   REF: 011407ia   STA: A.G.1   TOP: Compositions of Polygons and Circles
KEY: area

726 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

727 ANS: 2

$1.5^3 = 3.375$

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

728 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

729 ANS:

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

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

730 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

731 ANS:

Carol's, by 14.9. $V_M = 5 \times 3.5 \times 7 = 122.5$. $V_C = \pi \times 2.5^2 \times 7 \approx 137.4$. $137.4 - 122.5 = 14.9$

PTS: 4   REF: 061237ia   STA: A.G.2   TOP: Volume

732 ANS: 4

$V = \pi r^2 h$

$32\pi = \pi r^2 (2)$

$16 = r^2$

$4 = r$

PTS: 2   REF: 081224ia   STA: A.G.2   TOP: Volume

733 ANS: 3

$\frac{10^3}{5^3} = \frac{1000}{125} = 8$

PTS: 2   REF: 011312ia   STA: A.G.2   TOP: Volume

734 ANS:

$V = \pi r^2 h = \pi \cdot 6.5^2 \cdot 24 = 1014\pi$

PTS: 2   REF: 061332ia   STA: A.G.2   TOP: Volume

735 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

736 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

737 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

738 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

739 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

740 ANS: 4
SA $= 2lw + 2hw + 2lh = 2(3)(2.2) + 2(7.5)(2.2) + 2(3)(7.5) = 91.2$

PTS: 2 REF: 081216ia STA: A.G.2 TOP: Surface Area

741 ANS: 2
$s^3 = 8.$ $6 \times (2 \times 2) = 24$
$s = 2$

PTS: 2 REF: 081325ia STA: A.G.2 TOP: Surface Area