

# JEFFERSON MATH PROJECT REGENTS BY PERFORMANCE INDICATOR: TOPIC

NY Integrated Algebra Regents Exam Questions  
from Fall 2007 to August 2012 Sorted by PI: Topic

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*Dear Sir*

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

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

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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  $\left| \frac{4(-6) + 18}{4!} \right|$ ?
  - 1  $\frac{1}{4}$
  - 2  $-\frac{1}{4}$
  - 3 12
  - 4 -12

**A.N.1: IDENTIFYING PROPERTIES**

- 6 Which property is illustrated by the equation  $ax + ay = a(x + y)$ ?
  - 1 associative
  - 2 commutative
  - 3 distributive
  - 4 identity
  
- 7 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
  
- 8 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.

$$\begin{array}{l} 5(x - 2) - 2(x - 5) = 9 \\ (1) \quad 5x - 10 - 2x + 10 = 9 \quad (1) \quad \underline{\hspace{2cm}} \\ (2) \quad 5x - 2x - 10 + 10 = 9 \quad (2) \quad \underline{\hspace{2cm}} \\ \quad \quad \quad 3x + 0 = 9 \\ \quad \quad \quad \quad \quad 3x = 9 \\ \quad \quad \quad \quad \quad \quad \quad x = 3 \end{array}$$

**A.N.1: PROPERTIES OF REALS**

- 9 What is the additive inverse of the expression  $a - b$ ?
  - 1  $a + b$
  - 2  $a - b$
  - 3  $-a + b$
  - 4  $-a - b$
  
- 10 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  $(x + y) + z = x + (y + z)$

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- 11 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  $3 + (x + y) = (x + y) + 3$
- 12 Which statement illustrates the additive identity property?
- 1  $6 + 0 = 6$
  - 2  $-6 + 6 = 0$
  - 3  $4(6 + 3) = 4(6) + 4(3)$
  - 4  $(4 + 6) + 3 = 4 + (6 + 3)$
- 13 Perform the indicated operation:  $-6(a - 7)$   
State the name of the property used.
- A.A.29: SET THEORY
- 14 Which interval notation represents the set of all numbers from 2 through 7, inclusive?
- 1  $(2, 7)$
  - 2  $[2, 7)$
  - 3  $[2, 7]$
  - 4  $(2, 7]$
- 15 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  $[5, 12]$
- 16 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  $[2, 20]$
- 17 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  $[-6, 14]$
- 18 Which interval notation describes the set  $S = \{x | 1 \leq x < 10\}$ ?
- 1  $[1, 10]$
  - 2  $(1, 10]$
  - 3  $[1, 10)$
  - 4  $(1, 10)$
- 19 The set  $\{1, 2, 3, 4\}$  is equivalent to
- 1  $\{x | 1 < x < 4, \text{ where } x \text{ is a whole number}\}$
  - 2  $\{x | 0 < x < 4, \text{ where } x \text{ is a whole number}\}$
  - 3  $\{x | 0 < x \leq 4, \text{ where } x \text{ is a whole number}\}$
  - 4  $\{x | 1 < x \leq 4, \text{ where } x \text{ is a whole number}\}$
- 20 The set  $\{11, 12\}$  is equivalent to
- 1  $\{x | 11 < x < 12, \text{ where } x \text{ is an integer}\}$
  - 2  $\{x | 11 < x \leq 12, \text{ where } x \text{ is an integer}\}$
  - 3  $\{x | 10 \leq x < 12, \text{ where } x \text{ is an integer}\}$
  - 4  $\{x | 10 < x \leq 12, \text{ where } x \text{ is an integer}\}$
- 21 Which set-builder notation describes  $\{-3, -2, -1, 0, 1, 2\}$ ?
- 1  $\{x | -3 \leq x < 2, \text{ where } x \text{ is an integer}\}$
  - 2  $\{x | -3 < x \leq 2, \text{ where } x \text{ is an integer}\}$
  - 3  $\{x | -3 < x < 2, \text{ where } x \text{ is an integer}\}$
  - 4  $\{x | -3 \leq x \leq 2, \text{ where } x \text{ is an integer}\}$
- 22 Which notation describes  $\{1, 2, 3\}$ ?
- 1  $\{x | 1 \leq x < 3, \text{ where } x \text{ is an integer}\}$
  - 2  $\{x | 0 < x \leq 3, \text{ where } x \text{ is an integer}\}$
  - 3  $\{x | 1 < x < 3, \text{ where } x \text{ is an integer}\}$
  - 4  $\{x | 0 \leq x \leq 3, \text{ where } x \text{ is an integer}\}$

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

A.A.30: SET THEORY

- 24 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  $\{H, P, S\}$

- 25 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  $\{1, 2, 3, 4, 5, 6, 7, 8\}$

- 26 Given:  
 $A = \{\text{All even integers from 2 to 20, inclusive}\}$   
 $B = \{10, 12, 14, 16, 18\}$   
 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  $\{2, 4, 6, 8, 20\}$

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

- 28 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  $\{-2, -1, 0, 1, 2, 3, 4, 5, 6\}$
- 29 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.

A.A.31: SET THEORY

- 30 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  $\{(-3, -4), (-2, -1), (-1, 2), (-1, 0), (1, 8)\}$

- 31 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  $\{0, 1, 2, 3, 4, 6\}$

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

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

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

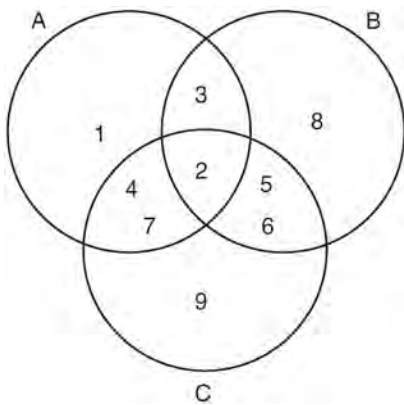
What is the intersection of sets  $X$ ,  $Y$ , and  $Z$ ?

- 1  $\{3, 4\}$
- 2  $\{2, 3, 4\}$
- 3  $\{3, 4, 5\}$
- 4  $\{1, 2, 3, 4, 5, 6\}$

33 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  $\{0\}$

34 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  $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

35 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  $\{2, 3, 4, 6, 8, 9, 10, 12, 15\}$

36 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  $\{2, 3, 4, 5, 7, 8, 9\}$

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

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

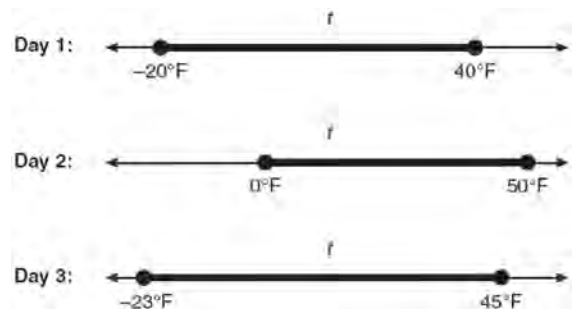
$C = \{2, 3, 5, 7\}$

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

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  $A \cap C = \{3, 5, 7\}$

38 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,  $t$ .

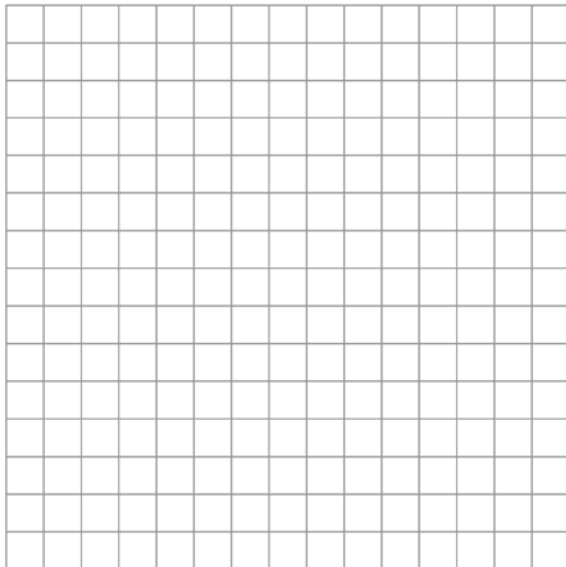
## GRAPHS AND STATISTICS

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

- 39 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.



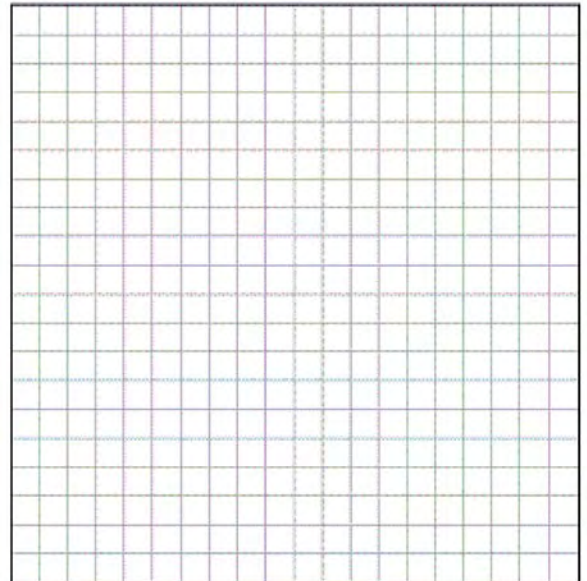
- 40 The Fahrenheit temperature readings on 30 April mornings in Stormville, New York, are shown below.

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.





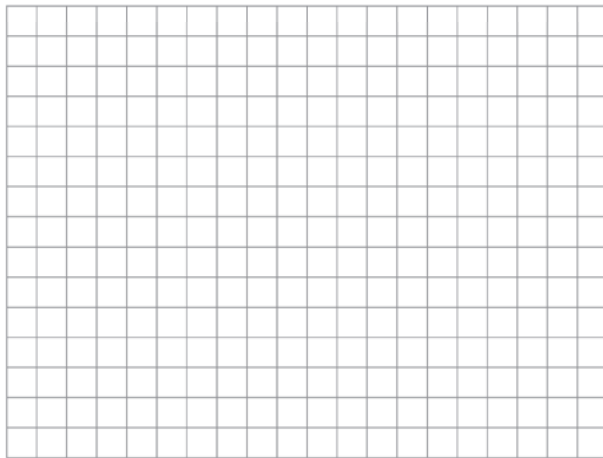
- 41 The test scores for 18 students in Ms. Mosher’s class are listed below:

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.



- 42 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.

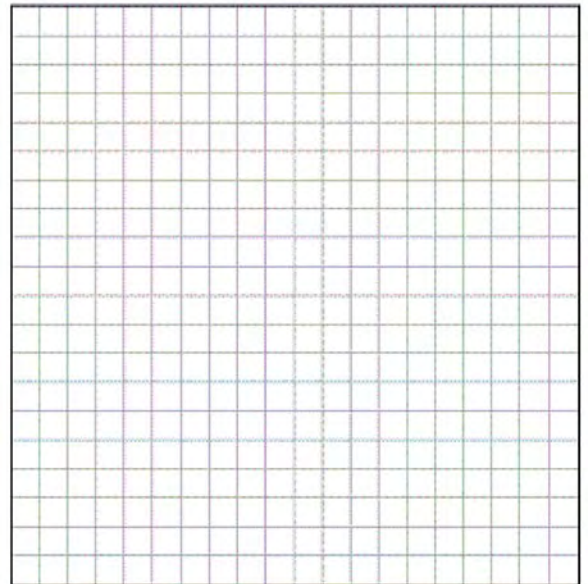
Interval	Tally	Frequency
0–1		
2–3		
4–5		
6–7		

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.



A.S.9: FREQUENCY HISTOGRAMS, BAR GRAPHS AND TABLES

- 43 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?

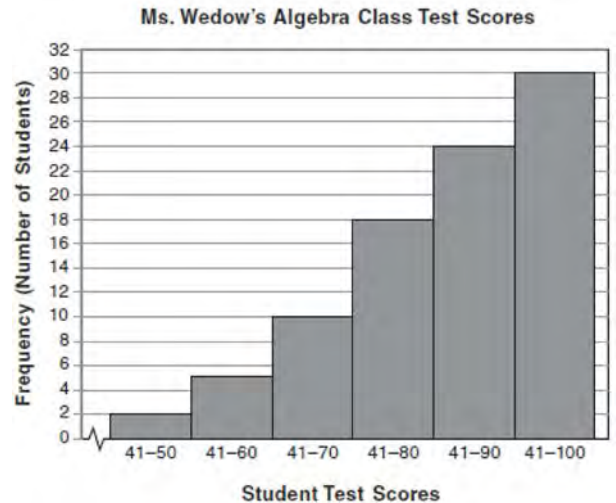
- 1 25
  - 2 10
  - 3 7
  - 4 6
- 44 The cumulative frequency table below shows the length of time that 30 students spent text messaging on a weekend.

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?

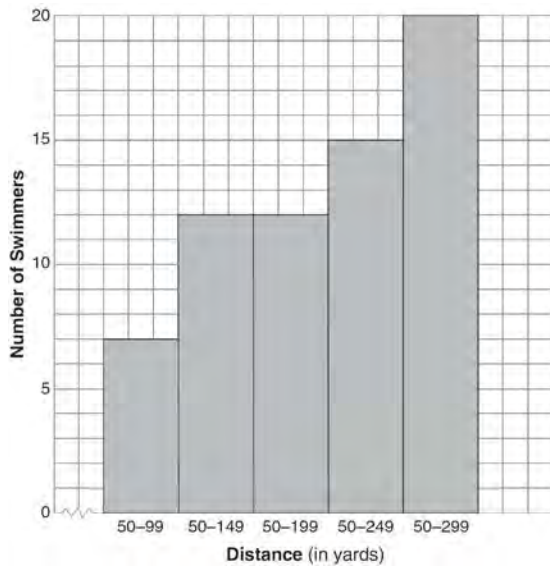
- 1 31 - 40
- 2 41 - 50
- 3 51 - 60
- 4 61 - 70

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



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.

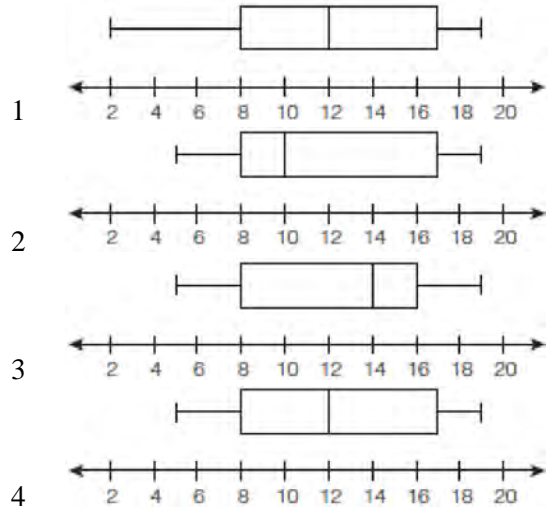
- 46 The following cumulative frequency histogram shows the distances swimmers completed in a recent swim test.



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.

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

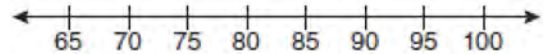
- 47 The data set 5, 6, 7, 8, 9, 9, 9, 10, 12, 14, 17, 17, 18, 19, 19 represents the number of hours spent on the Internet in a week by students in a mathematics class. Which box-and-whisker plot represents the data?



- 48 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.



- 49 The number of songs fifteen students have on their MP3 players is:

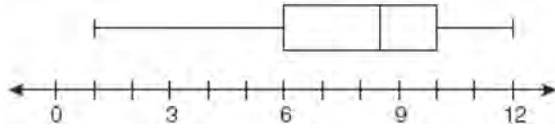
120, 124, 132, 145, 200, 255, 260, 292,  
308, 314, 342, 407, 421, 435, 452

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.



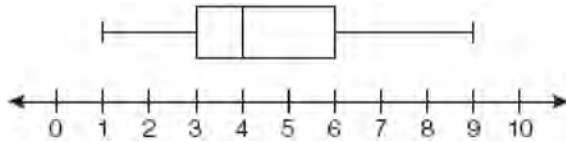
A.S.6: BOX-AND-WHISKER PLOTS

50 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

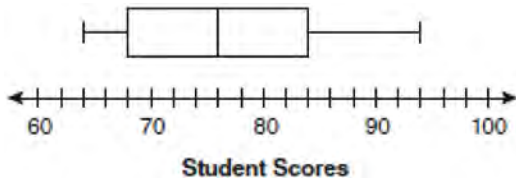
51 A movie theater recorded the number of tickets sold daily for a popular movie during the month of June. The box-and-whisker plot shown below represents the data for the number of tickets sold, in hundreds.



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.

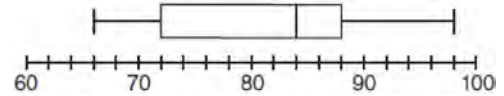
52 The box-and-whisker plot below represents students' scores on a recent English test.



What is the value of the upper quartile?

- 1 68
- 2 76
- 3 84
- 4 94

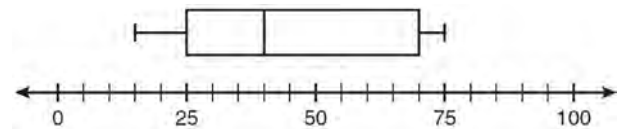
53 The box-and-whisker plot below represents the math test scores of 20 students.



What percentage of the test scores are *less than* 72?

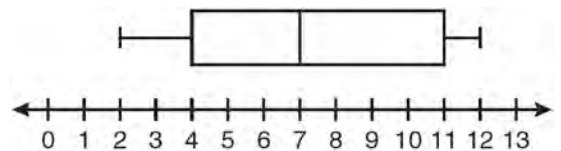
- 1 25
- 2 50
- 3 75
- 4 100

54 What is the range of the data represented in the box-and-whisker plot shown below?



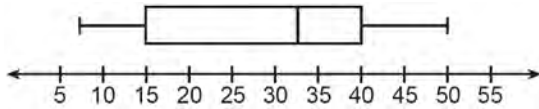
- 1 40
- 2 45
- 3 60
- 4 100

55 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.

- 56 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

A.S.11: QUARTILES AND PERCENTILES

- 57 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?

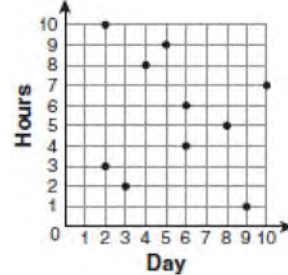
- 1 29.5
  - 2 30.5
  - 3 40
  - 4 60
- 58 Brianna's score on a national math assessment exceeded the scores of 95,000 of the 125,000 students who took the assessment. What was her percentile rank?
- 1 6
  - 2 24
  - 3 31
  - 4 76

A.S.7: SCATTER PLOTS

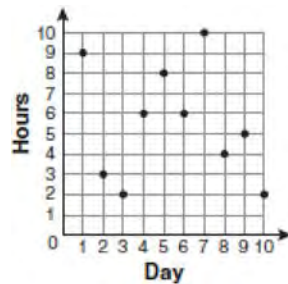
- 59 For 10 days, Romero kept a record of the number of hours he spent listening to music. The information is shown in the table below.

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

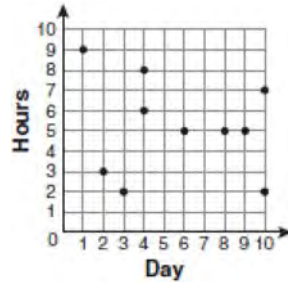
Which scatter plot shows Romero's data graphically?



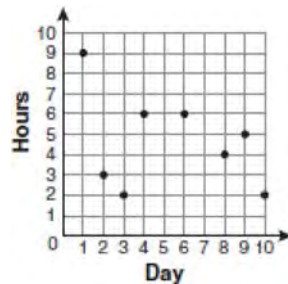
1



2



3

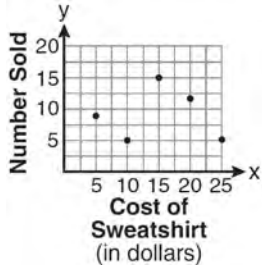
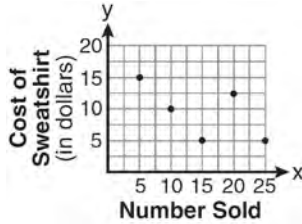
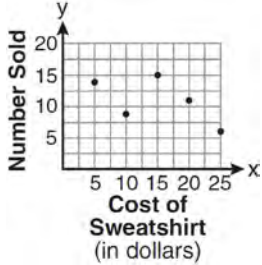
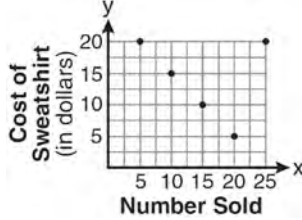


4

- 60 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.

<b>Cost of Sweatshirt</b>	\$10	\$25	\$15	\$20	\$5
<b>Number Sold</b>	9	6	15	11	14

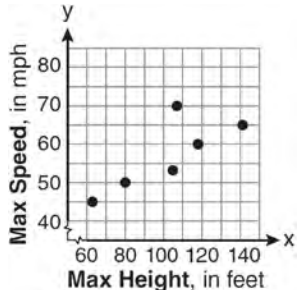
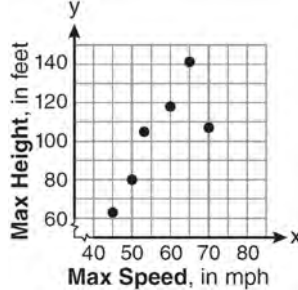
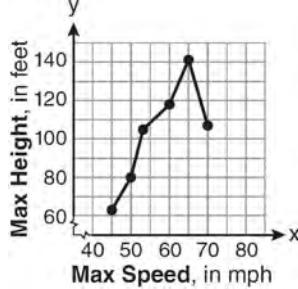
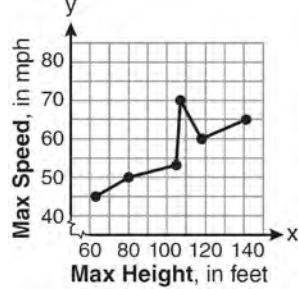
Which scatter plot represents the data?

- 1 
- 2 
- 3 
- 4 

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

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

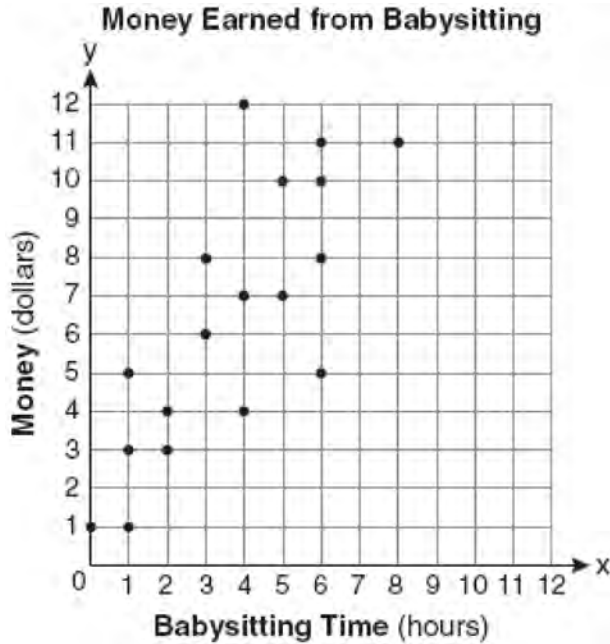
Which graph represents a correct scatter plot of the data?

- 1 
- 2 
- 3 
- 4 



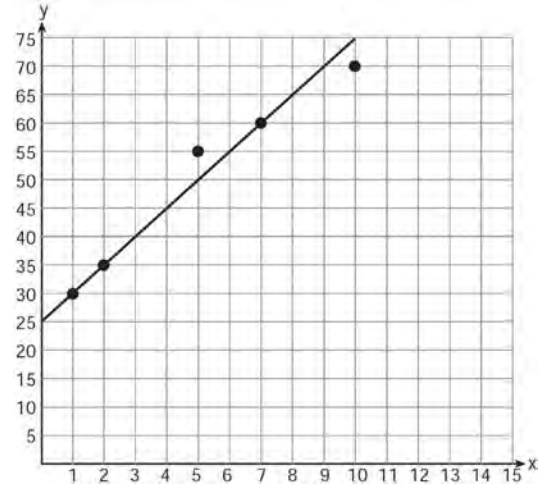
A.S.8: SCATTER PLOTS

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



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

63 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?

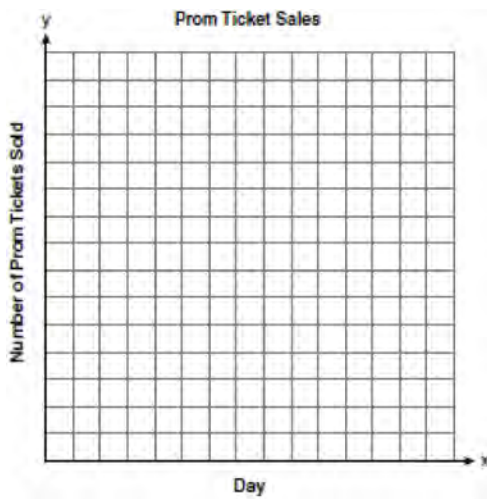
- 1  $y = x + 5$
- 2  $y = x + 25$
- 3  $y = 5x + 5$
- 4  $y = 5x + 25$

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

**Prom Ticket Sales**

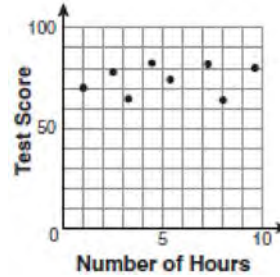
Day ( $x$ )	1	2	5	7	10
Number of Prom Tickets Sold ( $y$ )	30	35	55	60	70

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.

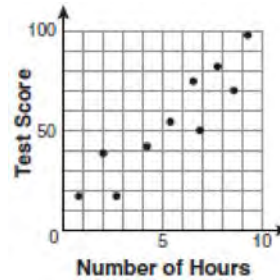


A.S.12: SCATTER PLOTS

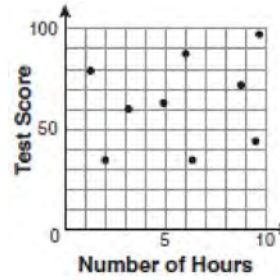
- 65 There is a negative correlation between the number of hours a student watches television and his or her social studies test score. Which scatter plot below displays this correlation?



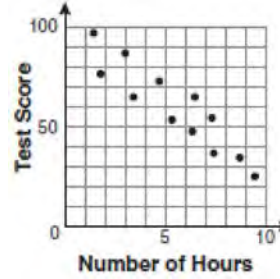
1



2



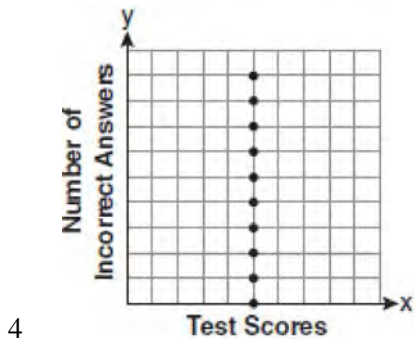
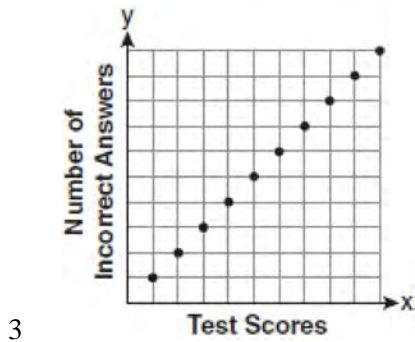
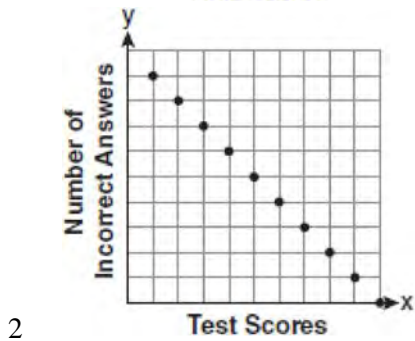
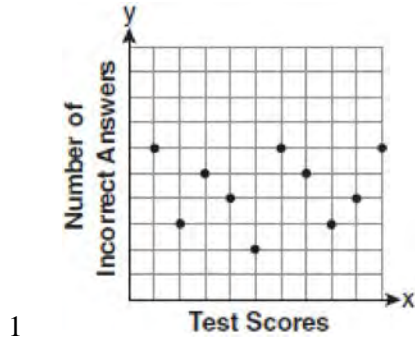
3



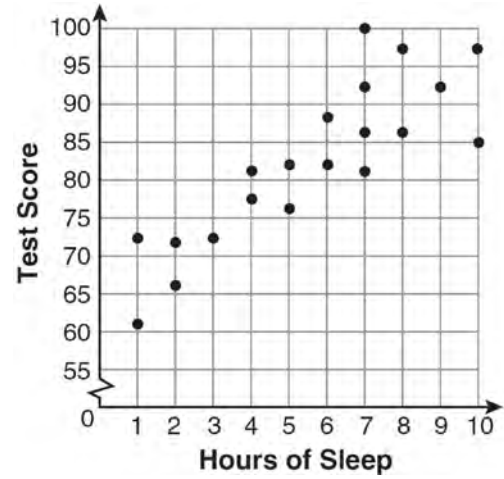
4



66 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?

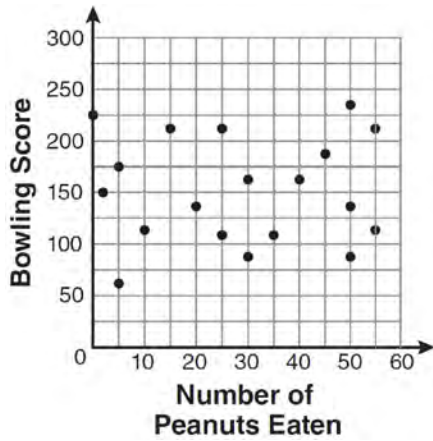


67 What is the relationship between the independent and dependent variables in the scatter plot shown below?



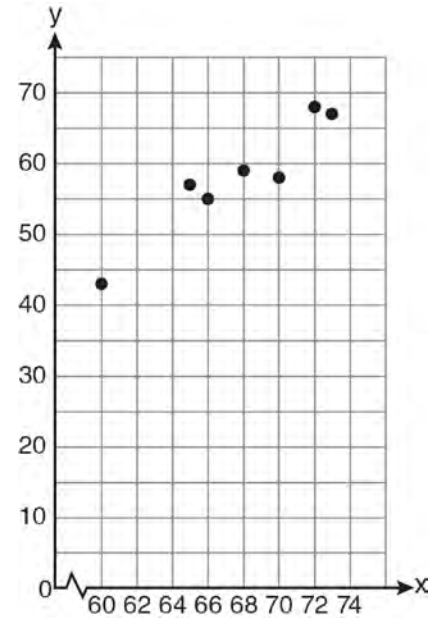
- 1 undefined correlation
- 2 negative correlation
- 3 positive correlation
- 4 no correlation

68 The scatter plot below represents the relationship between the number of peanuts a student eats and the student's bowling score.



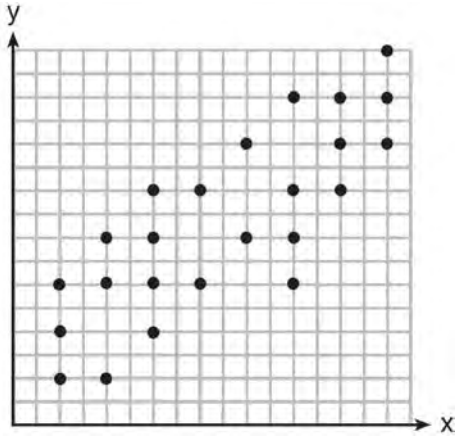
- Which conclusion about the scatter plot is valid?
- 1 There is almost no relationship between eating peanuts and bowling score.
  - 2 Students who eat more peanuts have higher bowling scores.
  - 3 Students who eat more peanuts have lower bowling scores.
  - 4 No bowlers eat peanuts.

69 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

- 70 The scatter plot shown below represents a relationship between  $x$  and  $y$ .

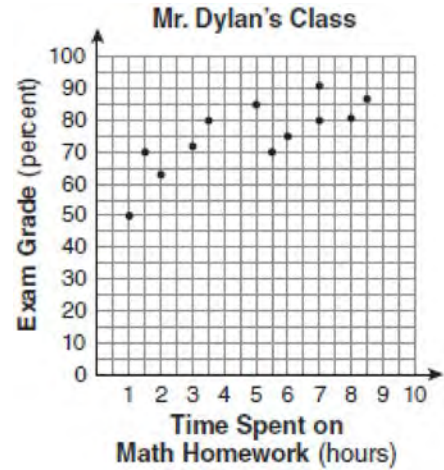


This type of relationship is

- 1 a positive correlation
- 2 a negative correlation
- 3 a zero correlation
- 4 not able to be determined

A.S.17: SCATTER PLOTS

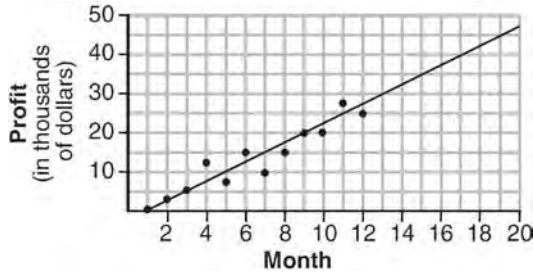
- 71 The number of hours spent on math homework each week and the final exam grades for twelve students in Mr. Dylan's algebra class are plotted below.



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

- 72 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.

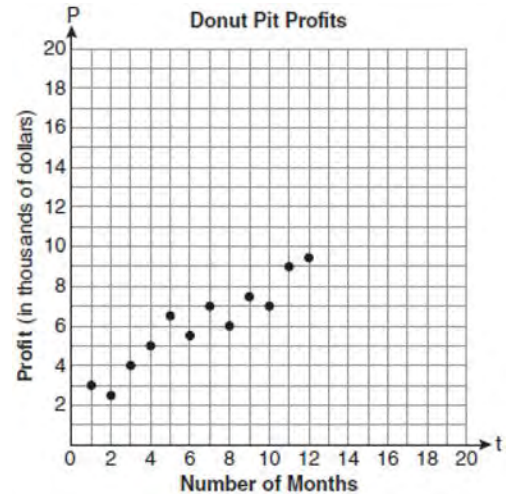


Using this line, what is the best estimate for profit in the 18th month?

- 1 \$35,000
- 2 \$37,750
- 3 \$42,500
- 4 \$45,000

- 73 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



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.

A.S.4: CENTRAL TENDENCY

- 74 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
- 75 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
- 76 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
- 77 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.

- 78 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.

A.S.16: CENTRAL TENDENCY

- 79 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.

- 80 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.

A.S.16: AVERAGE KNOWN WITH MISSING DATA

- 81 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

- 82 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
- 83 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

- 84 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

- 85 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

- 86 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

- 87 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

A.S.2: ANALYSIS OF DATA

- 88 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.

- 89 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

90 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

91 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

A.S.3: ANALYSIS OF DATA

- 92 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



- 93 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

- 94 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.

- 95 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.
- 96 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
- 97 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



A.S.13: ANALYSIS OF DATA

- 98 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
- 99 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.

A.S.14: ANALYSIS OF DATA

- 100 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
- 101 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

- 102 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
- 103 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.M.3: ERROR

- 104 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  $\frac{(130)(60) - (120)(54)}{(120)(54)}$
  - 2  $\frac{(120)(54)}{(130)(60) - (120)(54)}$
  - 3  $\frac{(130)(60) - (120)(54)}{(130)(60)}$
  - 4  $\frac{(130)(60)}{(130)(60) - (120)(54)}$

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

[www.jmap.org](http://www.jmap.org)

- 105 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
- 106 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
- 107 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
- 108 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
- 109 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
- 110 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
- 111 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
- 112 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*.
- 113 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.

114 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*.

115 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*.

116 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*.

117 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*.

118 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.

## PROBABILITY

### A.S.19: SAMPLE SPACE

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

120 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.

121 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.

122 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.

- 123 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.

- 124 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.

A.S.21: EXPERIMENTAL PROBABILITY

- 125 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  $\frac{1}{30}$

- 126 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  $\frac{5}{8}$

- 127 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  $\frac{14}{20}$

- 128 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.

A.S.20: THEORETICAL PROBABILITY

- 129 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

- 130 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

- 131 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

- 132 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.

- 133 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.



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.

- 134 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.

A.S.23: THEORETICAL PROBABILITY

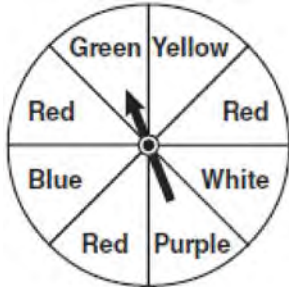
- 135 Throughout history, many people have contributed to the development of mathematics. These mathematicians include Pythagoras, Euclid, Hypatia, Euler, Einstein, Agnesi, Fibonacci, and Pascal. What is the probability that a mathematician's name selected at random from those listed will start with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

- 1  $\frac{2}{8}$
- 2  $\frac{3}{8}$
- 3  $\frac{4}{8}$
- 4  $\frac{6}{8}$

- 136 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  $\frac{1}{6}$
- 137 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  $\frac{9}{10}$
- 138 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  $\frac{2}{3}$
- 139 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  $\frac{1}{2} \times \frac{2}{5}$
- 140 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.

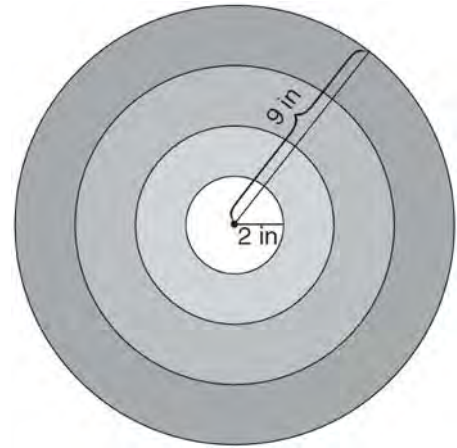
A.S.20: GEOMETRIC PROBABILITY

- 141 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  $\frac{7}{8}$

- 142 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.

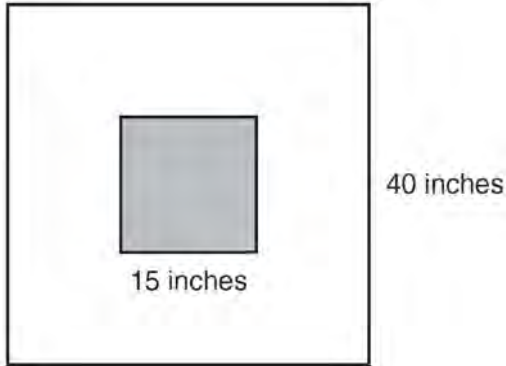


If a dart is thrown and hits the board, what is the probability that the dart will land in the bull's-eye?

- 1  $\frac{2}{9}$
- 2  $\frac{7}{9}$
- 3  $\frac{4}{81}$
- 4  $\frac{49}{81}$



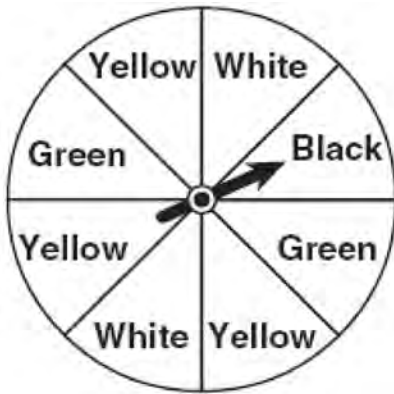
- 143 The square dart board shown below has a side that measures 40 inches. The shaded portion in the center is a square whose side is 15 inches. A dart thrown at the board is equally likely to land on any point on the dartboard.



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

A.S.22: GEOMETRIC PROBABILITY

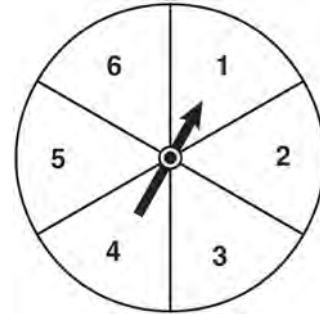
- 144 A spinner is divided into eight equal regions as shown in the diagram below.



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.

- 145 The spinner shown in the diagram below is divided into six equal sections.

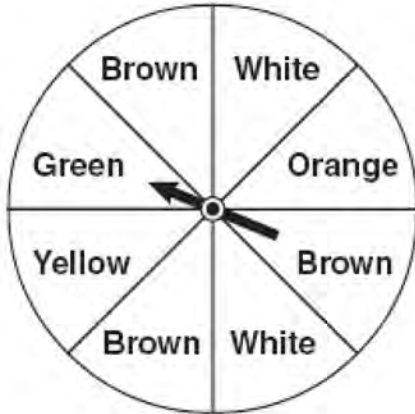


Which outcome is *least* likely to occur on a single spin?

- 1 an odd number
- 2 a prime number
- 3 a perfect square
- 4 a number divisible by 2

A.S.23: GEOMETRIC PROBABILITY

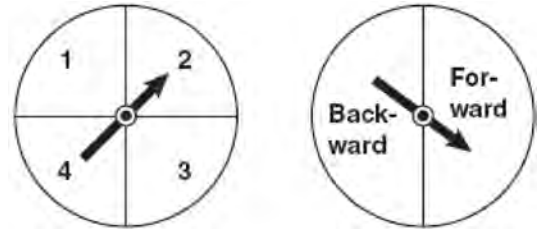
- 146 Keisha is playing a game using a wheel divided into eight equal sectors, as shown in the diagram below. Each time the spinner lands on orange, she will win a prize.



If Keisha spins this wheel twice, what is the probability she will win a prize on *both* spins?

- 1  $\frac{1}{64}$
- 2  $\frac{1}{56}$
- 3  $\frac{1}{16}$
- 4  $\frac{1}{4}$

- 147 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*.

A.S.18: CONDITIONAL PROBABILITY

- 148 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?

A.N.7: MULTIPLICATION COUNTING PRINCIPLE

- 149 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

- 150 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

A.N.8: PERMUTATIONS

- 151 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  ${}_{10}P_7$

- 152 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

- 153 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

- 154 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

- 155 How many different ways can five books be arranged on a shelf?

1 5  
2 15  
3 25  
4 120

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

- 157 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.

- 158 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.

## EXPRESSIONS AND EQUATIONS

### A.A.1: EXPRESSIONS

- 159 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  $25x - 75$
- 160 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  $3w^2 - 7w$
- 161 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  $58 + s + w$
- 162 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  $5x + 20$
- 163 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  $4(x + 2)$
- 164 Which algebraic expression represents 15 less than  $x$  divided by 9?
- 1  $\frac{x}{9} - 15$
  - 2  $9x - 15$
  - 3  $15 - \frac{x}{9}$
  - 4  $15 - 9x$
- 165 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  $\frac{dh}{2}$
  - 3  $d - 2h$
  - 4  $d - \frac{h}{2}$
- 166 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  $4 - 3x$
- 167 A correct translation of "six less than twice the value of  $x$ " is
- 1  $2x < 6$
  - 2  $2x - 6$
  - 3  $6 < 2x$
  - 4  $6 - 2x$

A.A.2: EXPRESSIONS

- 168 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  $n$
- 169 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
- 170 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

A.A.3: EXPRESSIONS

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

- 174 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
- 175 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

A.A.22: SOLVING EQUATIONS

- 176 Which value of  $p$  is the solution of  $5p - 1 = 2p + 20$ ?
- 1  $\frac{19}{7}$
  - 2  $\frac{19}{3}$
  - 3 3
  - 4 7

177 What is the value of  $x$  in the equation

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

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

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

$$\text{[Line 1]} \quad 3(x + 4) - 2 = 16$$

$$\text{[Line 2]} \quad 3(x + 4) = 18$$

$$\text{[Line 3]} \quad 3x + 4 = 18$$

$$\text{[Line 4]} \quad 3x = 14$$

$$\text{[Line 5]} \quad x = 4\frac{2}{3}$$

She made an error between lines

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

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

180 Solve algebraically for  $x$ :

$$3(x + 1) - 5x = 12 - (6x - 7)$$

A.A.25: SOLVING EQUATIONS WITH FRACTIONAL EXPRESSIONS

181 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

182 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

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

- 1 8
- 2 13
- 3 15
- 4 23

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

- 1 1
- 2 -1
- 3 3
- 4 -3

185 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  $\frac{3}{2}$

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

A.A.25: SOLVING EQUATIONS WITH DECIMALS

187 The value of  $y$  in the equation

$$0.06y + 200 = 0.03y + 350$$
 is

- 1 500
- 2  $1,666.\bar{6}$
- 3 5,000
- 4  $18,333.\bar{3}$

A.A.4: MODELING EQUATIONS

- 188 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  $60h + 9 = 375$

A.A.5: MODELING EQUATIONS

- 189 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  $w^2 + 5w - 36 = 0$
- 190 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  $0.15(x + 6) = 1.35$
- 191 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  $x(2x - 3) = 43$

- 192 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

- 193 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
- 194 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.23: TRANSFORMING FORMULAS

- 195 If  $3ax + b = c$ , then  $x$  equals
- 1  $c - b + 3a$
  - 2  $c + b - 3a$
  - 3  $\frac{c - b}{3a}$
  - 4  $\frac{b - c}{3a}$
- 196 If the formula for the perimeter of a rectangle is  $P = 2l + 2w$ , then  $w$  can be expressed as
- 1  $w = \frac{2l - P}{2}$
  - 2  $w = \frac{P - 2l}{2}$
  - 3  $w = \frac{P - l}{2}$
  - 4  $w = \frac{P - 2w}{2l}$

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

[www.jmap.org](http://www.jmap.org)

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

- 1  $\frac{b}{r} + 1$
- 2  $\frac{1+b}{r}$
- 3  $\frac{b+r}{1+r}$
- 4  $\frac{1+b}{r+b}$

198 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  $n = \frac{p}{r}$
- 4  $n = \frac{r}{p}$

199 A formula used for calculating velocity is

$v = \frac{1}{2} at^2$ . What is  $a$  expressed in terms of  $v$  and  $t$ ?

- 1  $a = \frac{2v}{t}$
- 2  $a = \frac{2v}{t^2}$
- 3  $a = \frac{v}{t}$
- 4  $a = \frac{v}{2t^2}$

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

- 1  $y = \frac{tn+k}{e}$
- 2  $y = \frac{tn-k}{e}$
- 3  $y = \frac{n(t+k)}{e}$
- 4  $y = \frac{n(t-k)}{e}$

201 If  $s = \frac{2x+t}{r}$ , then  $x$  equals

- 1  $\frac{rs-t}{2}$
- 2  $\frac{rs+1}{2}$
- 3  $2rs-t$
- 4  $rs-2t$

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

- 1  $\frac{k}{a+3x}$
- 2  $\frac{k-3mx}{a}$
- 3  $\frac{k-am}{3x}$
- 4  $\frac{k-a}{3x}$

203 The formula for the volume of a pyramid is

$V = \frac{1}{3} Bh$ . What is  $h$  expressed in terms of  $B$  and  $V$ ?

- 1  $h = \frac{1}{3} VB$
- 2  $h = \frac{V}{3B}$
- 3  $h = \frac{3V}{B}$
- 4  $h = 3VB$

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

A.M.1: USING RATE

205 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



Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

[www.jmap.org](http://www.jmap.org)

- 206 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
- 207 Joseph typed a 1,200-word essay in 25 minutes. At this rate, determine how many words he can type in 45 minutes.
- 208 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.

A.M.1: SPEED

- 209 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
- 210 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
- 211 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
- 212 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
- 213 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
- 214 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.
- 215 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.
- 216 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.

- 217 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?

A.M.2: CONVERSIONS

- 218 On a certain day in Toronto, Canada, the temperature was  $15^{\circ}$  Celsius (C). Using the formula  $F = \frac{9}{5}C + 32$ , Peter converts this temperature to degrees Fahrenheit (F). Which temperature represents  $15^{\circ}$ C in degrees Fahrenheit?
- 1 -9
  - 2 35
  - 3 59
  - 4 85
- 219 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

- 220 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  $5\frac{3}{4}$

- 221 Peter walked 8,900 feet from home to school.

1 mile = 5,280 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

- 222 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.

- 223 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

- 224 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*.

A.N.5: PERCENTS

- 225 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

- 226 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?

- 227 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.

- 228 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.

A.N.5: DIRECT VARIATION

- 229 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

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

Number of Hours ( <i>h</i> )	Dollars Earned ( <i>d</i> )
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.

LINEAR EQUATIONS

A.A.32: SLOPE

- 231 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

- 232 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

- 233 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
- A.A.33: SLOPE
- 234 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  $-\frac{3}{2}$

- 235 What is the slope of the line that passes through the points (-6, 1) and (4, -4)?
- 1 -2
  - 2 2
  - 3  $-\frac{1}{2}$
  - 4  $\frac{1}{2}$

- 236 What is the slope of the line that passes through the points (2, 5) and (7, 3)?
- 1  $-\frac{5}{2}$
  - 2  $-\frac{2}{5}$
  - 3  $\frac{8}{9}$
  - 4  $\frac{9}{8}$

- 237 What is the slope of the line that passes through the points (-5, 4) and (15, -4)?
- 1  $-\frac{2}{5}$
  - 2 0
  - 3  $-\frac{5}{2}$
  - 4 undefined

- 238 What is the slope of the line that passes through the points (3, 5) and (-2, 2)?
- 1  $\frac{1}{5}$
  - 2  $\frac{3}{5}$
  - 3  $\frac{5}{3}$
  - 4 5

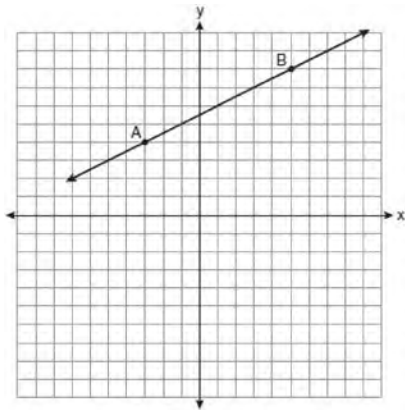
239 What is the slope of the line passing through the points  $(-2, 4)$  and  $(3, 6)$ ?

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

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

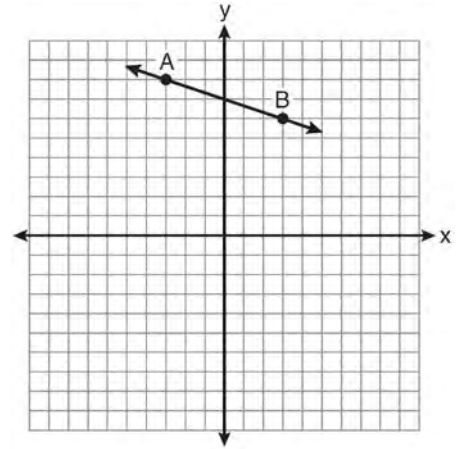
- 1  $-\frac{2}{3}$
- 2  $\frac{2}{3}$
- 3  $-\frac{4}{3}$
- 4  $\frac{4}{3}$

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



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

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



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

A.A.37: SLOPE

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

- 1  $-\frac{3}{7}$
- 2  $\frac{3}{7}$
- 3  $-\frac{7}{3}$
- 4  $\frac{7}{3}$

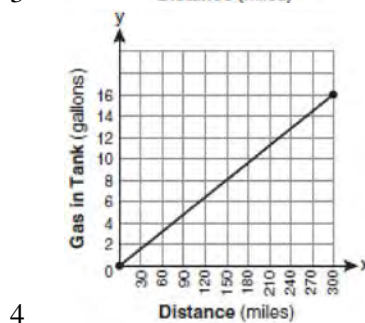
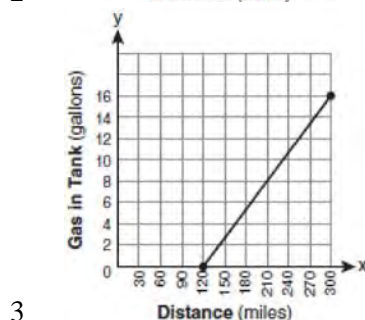
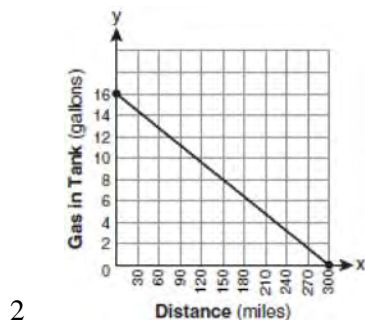
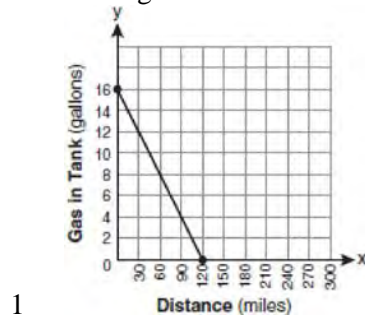
244 The line represented by the equation  $2y - 3x = 4$  has a slope of

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

**Integrated Algebra Regents Exam Questions by Performance Indicator: Topic**

A.G.4: GRAPHING LINEAR FUNCTIONS

- 245 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?



A.A.34: WRITING LINEAR EQUATIONS

- 246 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  $y = -3x + 14$
- 247 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  $y = 2x - 7$
- 248 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  $y = 2x + 3$
- 249 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  $4y = 3x + 5$
- 250 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.

A.A.35: WRITING LINEAR EQUATIONS

251 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  $y = -\frac{2}{3}x - 2$

252 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  $x = y$

253 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  $y = -\frac{2}{3}x + 9$

254 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  $y + 5 = \frac{2}{7}(x - 8)$

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

A.A.39: IDENTIFYING POINTS ON A LINE

256 Which point is on the line  $4y - 2x = 0$ ?

1 (-2, -1)

2 (-2, 1)

3 (-1, -2)

4 (1, 2)

257 Which linear equation represents a line containing the point (1, 3)?

1  $x + 2y = 5$

2  $x - 2y = 5$

3  $2x + y = 5$

4  $2x - y = 5$

258 Which point lies on the line whose equation is  $2x - 3y = 9$ ?

1 (-1, -3)

2 (-1, 3)

3 (0, 3)

4 (0, -3)

259 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)

260 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)

A.A.36: PARALLEL AND PERPENDICULAR LINES

261 Which equation represents a line parallel to the  $x$ -axis?

- 1  $x = 5$
- 2  $y = 10$
- 3  $x = \frac{1}{3}y$
- 4  $y = 5x + 17$

262 Which equation represents a line parallel to the  $x$ -axis?

- 1  $y = -5$
- 2  $y = -5x$
- 3  $x = 3$
- 4  $x = 3y$

263 Which equation represents a line parallel to the  $y$ -axis?

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

264 Which equation represents a line parallel to the  $y$ -axis?

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

A.A.38: PARALLEL AND PERPENDICULAR LINES

265 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  $y = 4x + 5$

266 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  $y = 4x - 2$

267 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  $y = 2x + 8$

268 The graphs of the equations  $y = 2x - 7$  and  $y - kx = 7$  are parallel when  $k$  equals

- 1  $-2$
- 2  $2$
- 3  $-7$
- 4  $7$

**INEQUALITIES**

A.A.24: SOLVING INEQUALITIES

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

- 1  $m \leq 5$
- 2  $m \geq 5$
- 3  $m \leq 4$
- 4  $m \geq 4$

270 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  $x \leq -3$

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



A.A.21: INTERPRETING SOLUTIONS

272 Which value of  $x$  is in the solution set of the inequality  $-2x + 5 > 17$ ?

- 1 -8
- 2 -6
- 3 -4
- 4 12

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

- 1 -2
- 2 2
- 3 3
- 4 -4

274 Which value of  $x$  is in the solution set of

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

- 1 8
- 2 9
- 3 12
- 4 16

275 Which value of  $x$  is in the solution set of the inequality  $-2(x - 5) < 4$ ?

- 1 0
- 2 2
- 3 3
- 4 5

276 Given:  $A = \{18, 6, -3, -12\}$

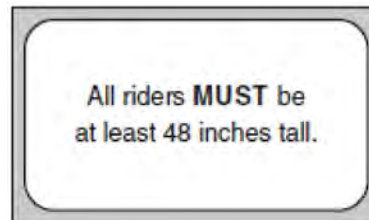
Determine all elements of set  $A$  that are in the solution of the inequality  $\frac{2}{3}x + 3 < -2x - 7$ .

A.A.4: MODELING INEQUALITIES

277 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  $8 - 3x < 15$

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



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

279 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  $75d + 30c \leq 255$
- 3  $75d + 30c > 255$
- 4  $75d + 30c \geq 255$

280 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  $155 \leq h \leq 190$
- 3  $h \geq 155$  or  $h \leq 190$
- 4  $h > 155$  or  $h < 190$

Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

[www.jmap.org](http://www.jmap.org)

- 281 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  $p \geq 78$
  - 2  $8p \geq 78$
  - 3  $8 + p \geq 78$
  - 4  $78 - p \geq 8$
- 282 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  $0.75x - (1.25)(200) \geq 250.00$
  - 2  $0.75x + (1.25)(200) \geq 250.00$
  - 3  $(0.75)(200) - 1.25x \geq 250.00$
  - 4  $(0.75)(200) + 1.25x \geq 250.00$
- 283 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  $30 + 2w \leq 50$
  - 3  $30 + 2w > 50$
  - 4  $30 + 2w \geq 50$
- 285 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
- 286 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
- 287 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
- 288 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?

A.A.6: MODELING INEQUALITIES

- 284 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
- 289 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.

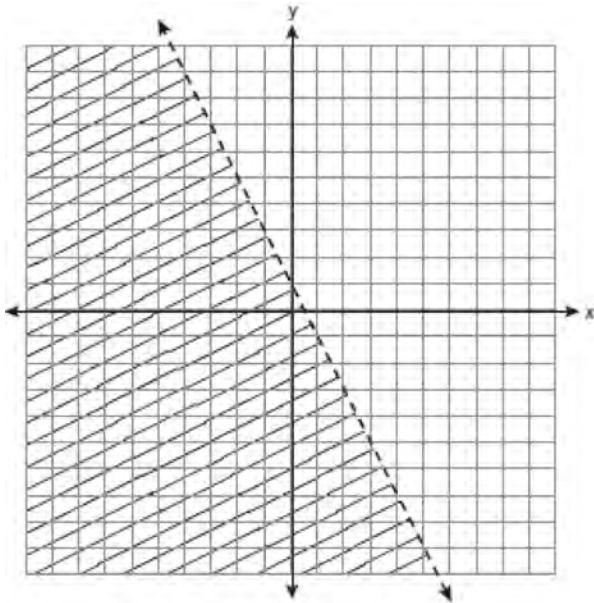
290 Chelsea has \$45 to spend at the fair. She spends \$20 on admission and \$15 on snacks. She wants to play a game that costs \$0.65 per game. Write an inequality to find the maximum number of times,  $x$ , Chelsea can play the game. Using this inequality, determine the maximum number of times she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

A.G.6: LINEAR INEQUALITIES

291 Which quadrant will be completely shaded in the graph of the inequality  $y \leq 2x$ ?

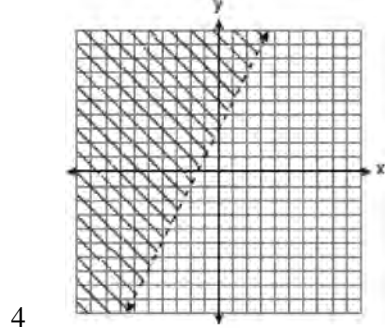
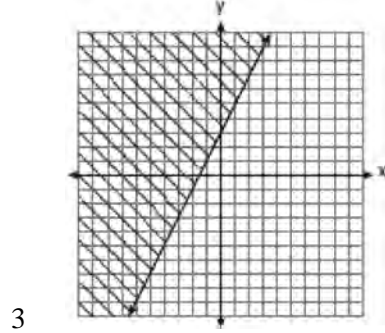
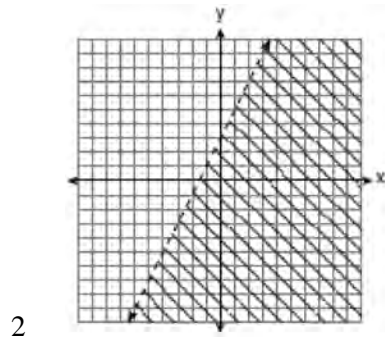
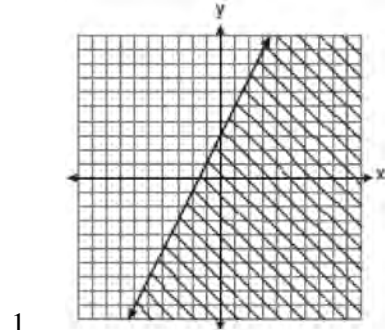
- 1 Quadrant I
- 2 Quadrant II
- 3 Quadrant III
- 4 Quadrant IV

292 Which inequality is represented by the graph below?

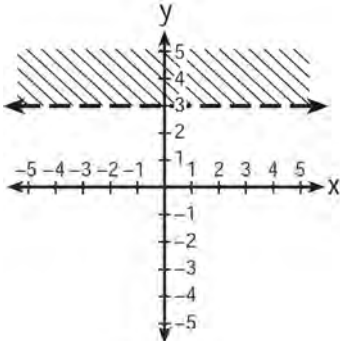


- 1  $y < 2x + 1$
- 2  $y < -2x + 1$
- 3  $y < \frac{1}{2}x + 1$
- 4  $y < -\frac{1}{2}x + 1$

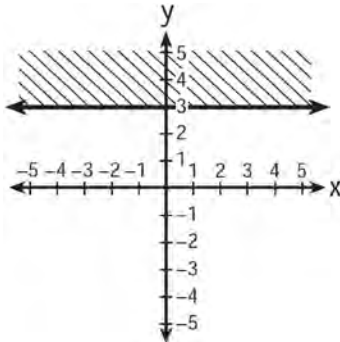
293 Which graph represents the solution of  $3y - 9 \leq 6x$ ?



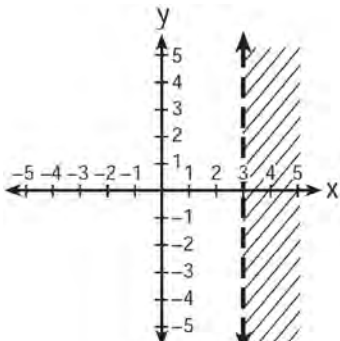
294 Which graph represents the inequality  $y > 3$ ?



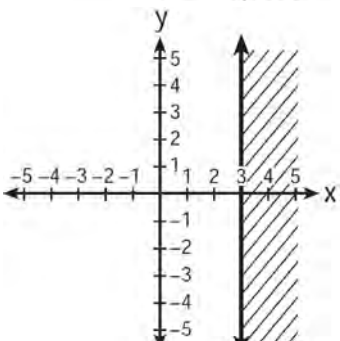
1



2

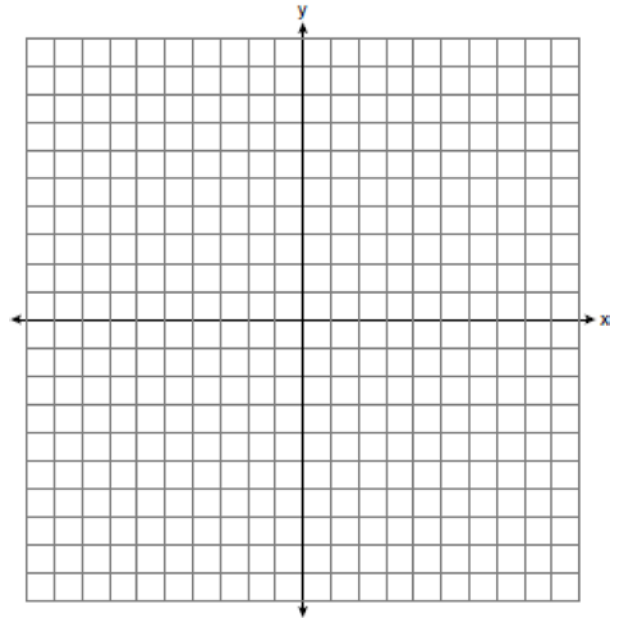


3



4

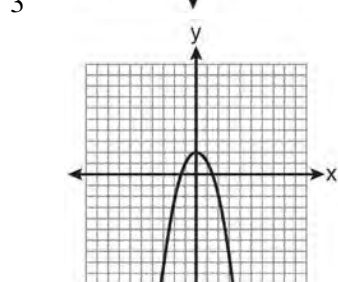
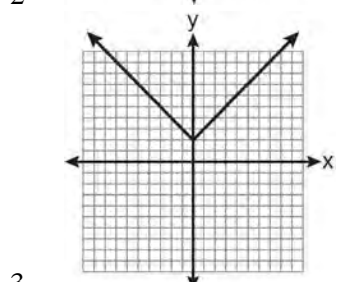
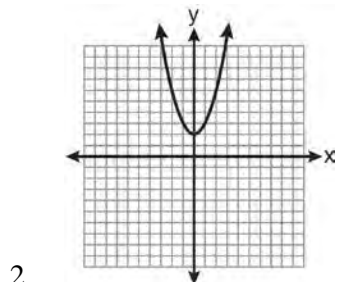
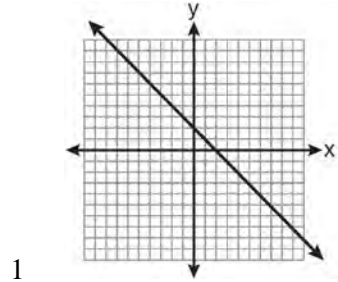
295 Graph the solution set for the inequality  $4x - 3y > 9$  on the set of axes below. Determine if the point  $(1, -3)$  is in the solution set. Justify your answer.



# ABSOLUTE VALUE

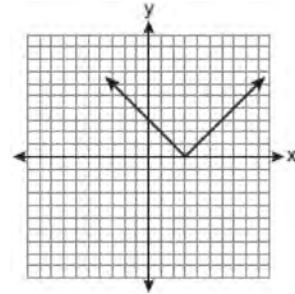
## A.G.4: GRAPHING ABSOLUTE VALUE FUNCTIONS

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

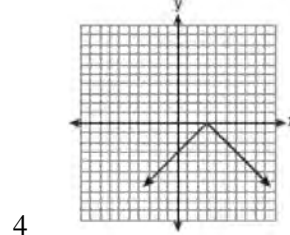
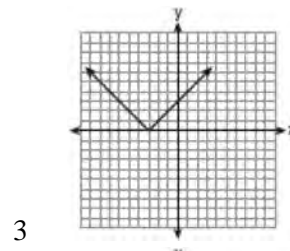
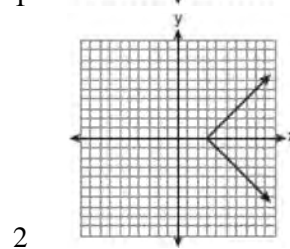
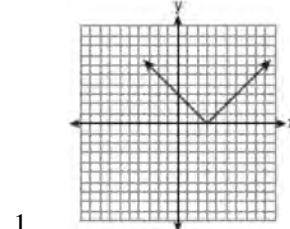


## A.G.5: GRAPHING ABSOLUTE VALUE FUNCTIONS

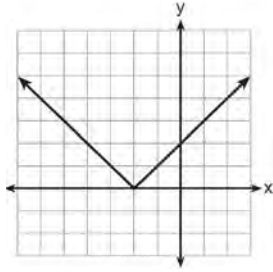
297 The diagram below shows the graph of  $y = |x - 3|$ .



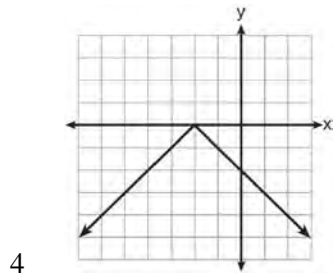
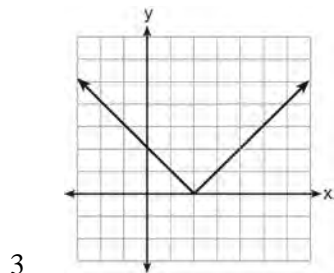
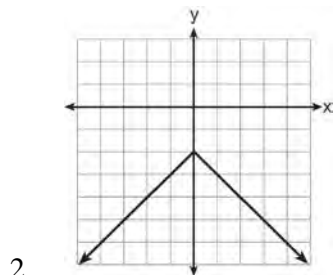
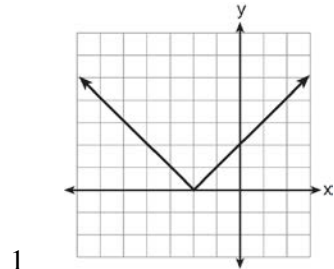
Which diagram shows the graph of  $y = -|x - 3|$ ?



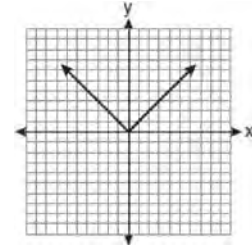
298 The graph of  $y = |x + 2|$  is shown below.



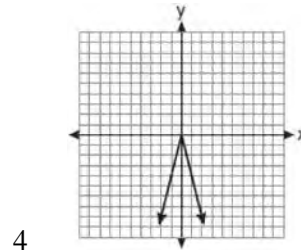
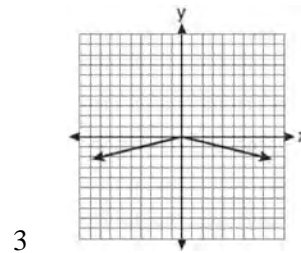
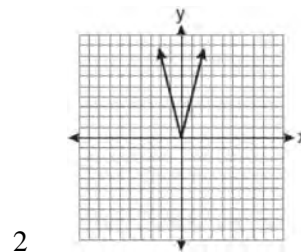
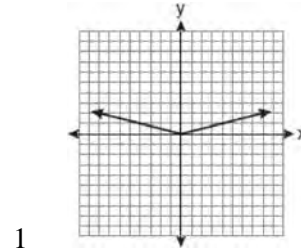
Which graph represents  $y = -|x + 2|$ ?



299 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  $-1 < a < 0$ ?

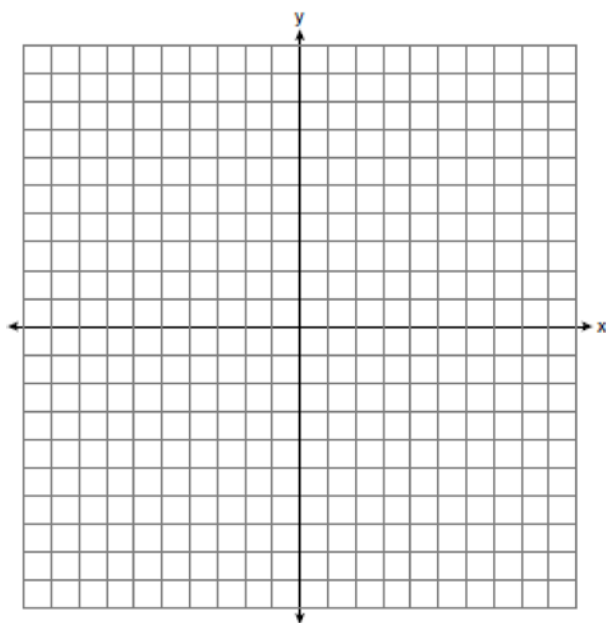


- 300 Graph and label the following equations on the set of axes below.

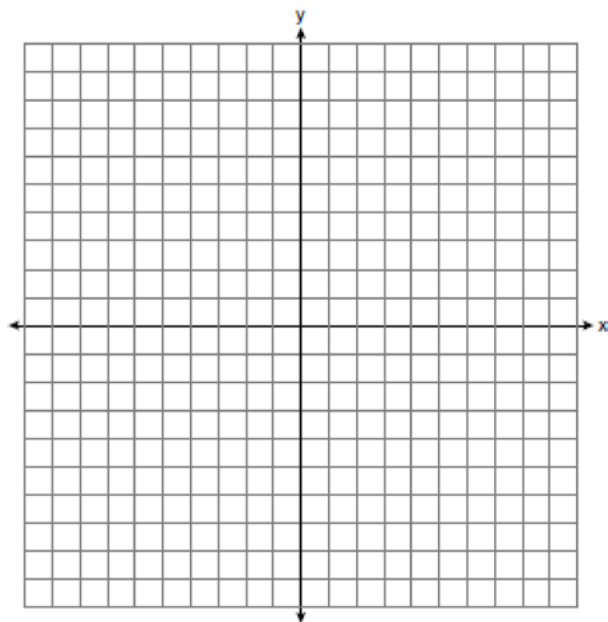
$$y = |x|$$

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

Explain how *decreasing* the coefficient of  $x$  affects the graph of the equation  $y = |x|$ .



- 301 On the set of axes below, graph and label the equations  $y = |x|$  and  $y = 3|x|$  for the interval  $-3 \leq x \leq 3$ .



Explain how changing the coefficient of the absolute value from 1 to 3 affects the graph.

## QUADRATICS

### A.A.20: FACTORING POLYNOMIALS

- 302 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  $2(x - 2)(x - 3)$
- 303 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  $(3x + 6)(x - 3)$

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304 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  $(x - 4)$

305 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  $3x(x - 5)(x - 6)$

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

306 The expression  $x^2 - 16$  is equivalent to

- 1  $(x + 2)(x - 8)$
- 2  $(x - 2)(x + 8)$
- 3  $(x + 4)(x - 4)$
- 4  $(x + 8)(x - 8)$

307 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  $(8x - 5y)(8x - 5y)$

308 The expression  $9x^2 - 100$  is equivalent to

- 1  $(9x - 10)(x + 10)$
- 2  $(3x - 10)(3x + 10)$
- 3  $(3x - 100)(3x - 1)$
- 4  $(9x - 100)(x + 1)$

309 Which expression is equivalent to  $9x^2 - 16$ ?

- 1  $(3x + 4)(3x - 4)$
- 2  $(3x - 4)(3x - 4)$
- 3  $(3x + 8)(3x - 8)$
- 4  $(3x - 8)(3x - 8)$

310 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  $(2y - 5)(y - 5)$

311 Which expression is equivalent to  $121 - x^2$ ?

- 1  $(x - 11)(x - 11)$
- 2  $(x + 11)(x - 11)$
- 3  $(11 - x)(11 + x)$
- 4  $(11 - x)(11 - x)$

312 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  $a(a - 2)^2$

313 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  $(x + 18y)(x - 18y)$

314 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  $(18x + 50y^3)(18x - 50y^3)$

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

- 1  $(8 - x)(8 - x)$
- 2  $(8 - x)(8 + x)$
- 3  $(x - 8)(x - 8)$
- 4  $(x - 8)(x + 8)$



- 316 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  $(3a - 8b)(3a - 8b)$

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

A.A.27: SOLVING QUADRATICS BY FACTORING

- 318 The solution to the equation  $x^2 - 6x = 0$  is
- 1 0, only
  - 2 6, only
  - 3 0 and 6
  - 4  $\pm\sqrt{6}$

A.A.28: ROOTS OF QUADRATICS

- 319 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
- 320 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
- 321 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  $x^2 - 2x + 15 = 0$
- 322 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

- 323 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

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

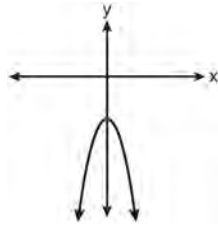
- 325 Find the roots of the equation  $x^2 = 30 - 13x$  algebraically.

A.G.5: GRAPHING QUADRATIC FUNCTIONS

- 326 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.
- 327 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.

- 328 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

- 329 The diagram below shows the graph of  $y = -x^2 - c$ .

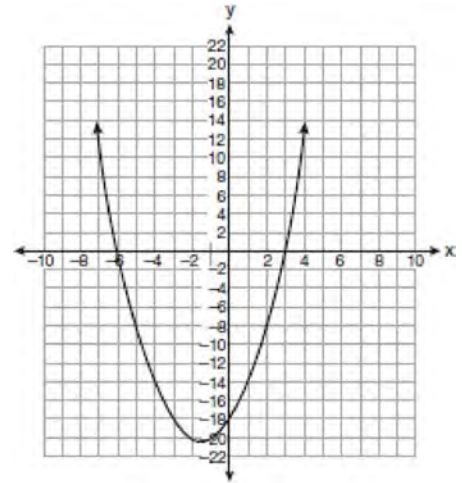


Which diagram shows the graph of  $y = x^2 - c$ ?

- 1
- 2
- 3
- 4

A.G.8: SOLVING QUADRATICS BY GRAPHING

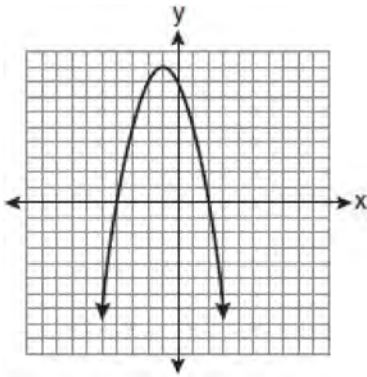
- 330 The equation  $y = x^2 + 3x - 18$  is graphed on the set of axes below.



Based on this graph, what are the roots of the equation  $x^2 + 3x - 18 = 0$ ?

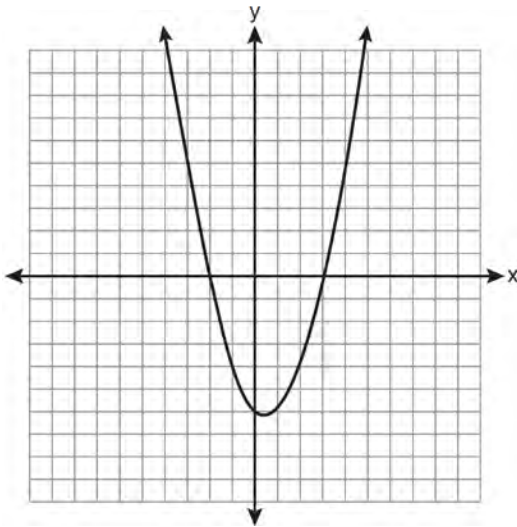
- 1 -3 and 6
- 2 0 and -18
- 3 3 and -6
- 4 3 and -18

- 331 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  $-x^2 - 2x + 8 = 0$ ?

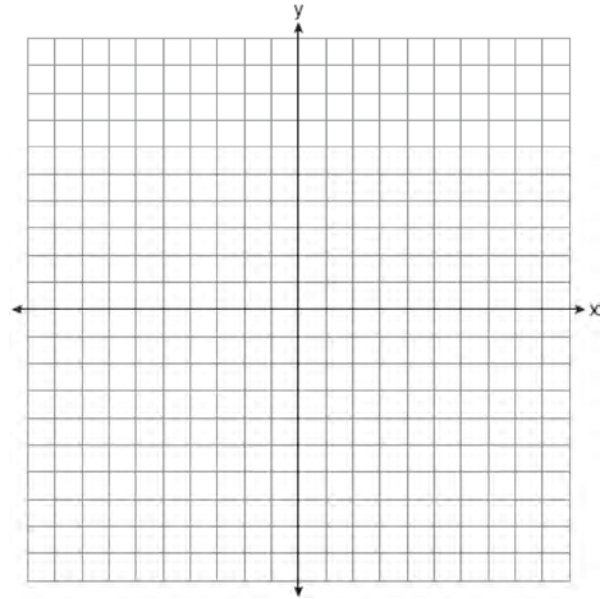
- 1 8 and 0
  - 2 2 and -4
  - 3 9 and -1
  - 4 4 and -2
- 332 A student correctly graphed the parabola shown below to solve a given quadratic equation.



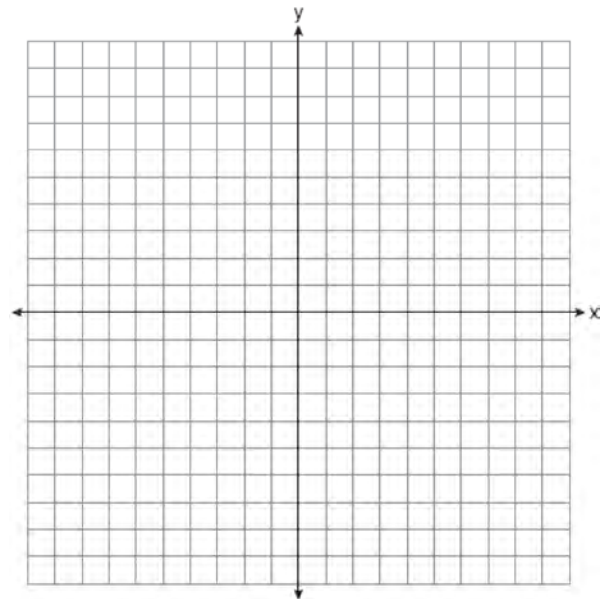
What are the roots of the quadratic equation associated with this graph?

- 1 -6 and 3
- 2 -6 and 0
- 3 -3 and 2
- 4 -2 and 3

- 333 Graph the equation  $y = x^2 - 2x - 3$  on the accompanying set of axes. Using the graph, determine the roots of the equation  $x^2 - 2x - 3 = 0$ .



- 334 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  $x^2 + 2x - 8 = 0$ .



A.A.8: WRITING QUADRATICS

335 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

336 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

337 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.]

A.A.8: GEOMETRIC APPLICATIONS OF QUADRATICS

338 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

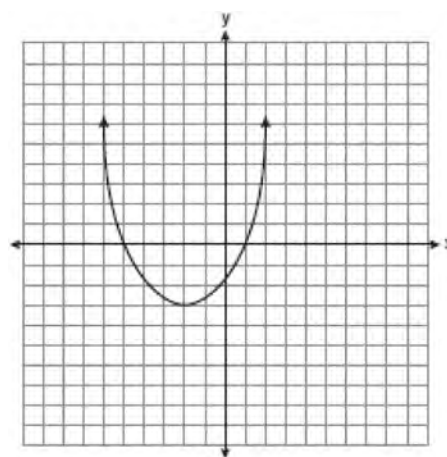
339 The length of a rectangle is 3 inches more than its width. The area of the rectangle is 40 square inches. What is the length, in inches, of the rectangle?

- 1 5
- 2 8
- 3 8.5
- 4 11.5

340 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.

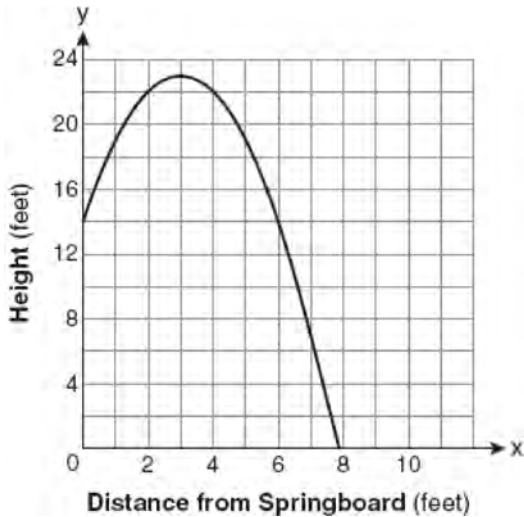
A.G.10: IDENTIFYING THE VERTEX OF A QUADRATIC GIVEN GRAPH

341 What are the vertex and the axis of symmetry of the parabola shown in the diagram below?



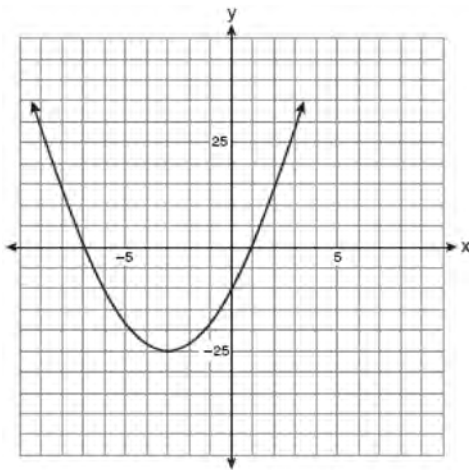
- 1 The vertex is  $(-2, -3)$ , and the axis of symmetry is  $x = -2$ .
- 2 The vertex is  $(-2, -3)$ , and the axis of symmetry is  $y = -2$ .
- 3 The vertex is  $(-3, -2)$ , and the axis of symmetry is  $y = -2$ .
- 4 The vertex is  $(-3, -2)$ , and the axis of symmetry is  $x = -2$ .

- 342 A swim team member performs a dive from a 14-foot-high springboard. The parabola below shows the path of her dive.



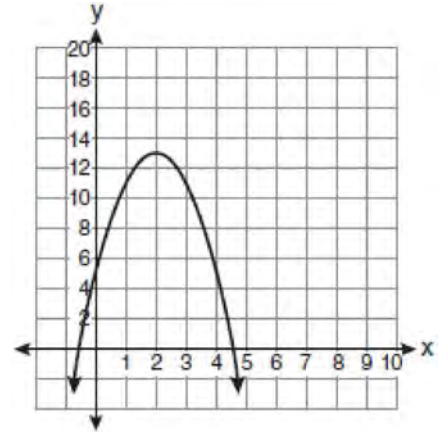
Which equation represents the axis of symmetry?

- 1  $x = 3$
  - 2  $y = 3$
  - 3  $x = 23$
  - 4  $y = 23$
- 343 Which equation represents the axis of symmetry of the graph of the parabola below?



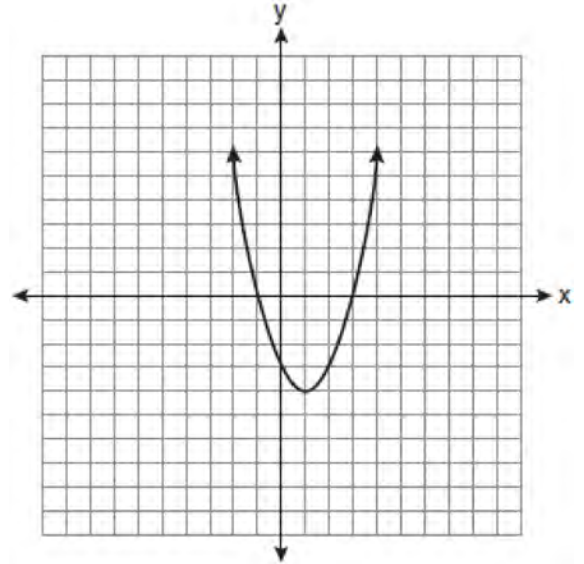
- 1  $y = -3$
- 2  $x = -3$
- 3  $y = -25$
- 4  $x = -25$

- 344 What is the equation of the axis of symmetry of the parabola shown in the diagram below?



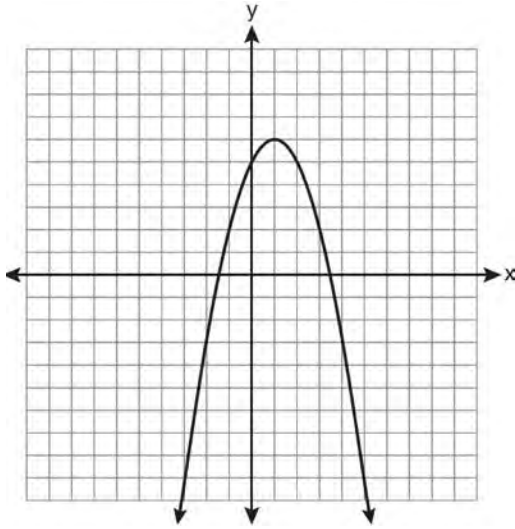
- 1  $x = -0.5$
- 2  $x = 2$
- 3  $x = 4.5$
- 4  $x = 13$

- 345 What are the vertex and axis of symmetry of the parabola shown in the diagram below?



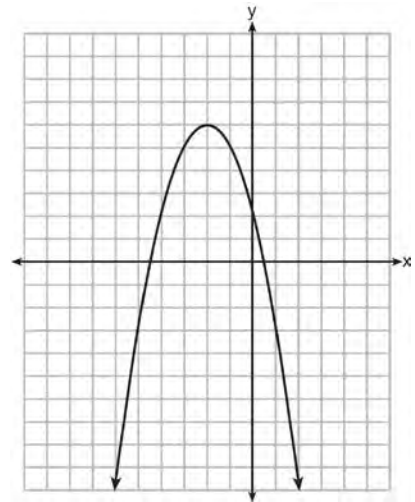
- 1 vertex:  $(1, -4)$ ; axis of symmetry:  $x = 1$
- 2 vertex:  $(1, -4)$ ; axis of symmetry:  $x = -4$
- 3 vertex:  $(-4, 1)$ ; axis of symmetry:  $x = 1$
- 4 vertex:  $(-4, 1)$ ; axis of symmetry:  $x = -4$

346 What are the vertex and the axis of symmetry of the parabola shown in the graph below?



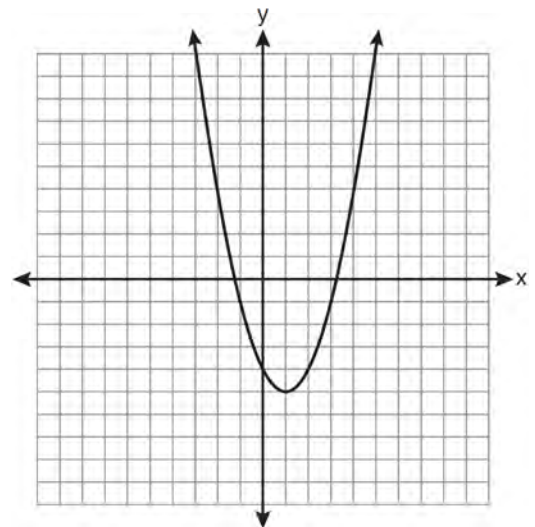
- 1 vertex: (1, 6); axis of symmetry:  $y = 1$
- 2 vertex: (1, 6); axis of symmetry:  $x = 1$
- 3 vertex: (6, 1); axis of symmetry:  $y = 1$
- 4 vertex: (6, 1); axis of symmetry:  $x = 1$

347 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  $x = -2$

348 State the equation of the axis of symmetry and the coordinates of the vertex of the parabola graphed below.



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

- 349 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:  $x = -8$
- 350 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  $x = -5$
- 351 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  $y = 6$
- 352 The equation of the axis of symmetry of the graph of  $y = 2x^2 - 3x + 7$  is
- 1  $x = \frac{3}{4}$
  - 2  $y = \frac{3}{4}$
  - 3  $x = \frac{3}{2}$
  - 4  $y = \frac{3}{2}$
- 353 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  $(-6, -316)$
- 354 Find algebraically the equation of the axis of symmetry and the coordinates of the vertex of the parabola whose equation is  $y = -2x^2 - 8x + 3$ .

## SYSTEMS

A.A.10: SOLVING LINEAR SYSTEMS

- 355 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
- 356 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
- 357 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
- 358 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  $c = 14, d = -2$

359 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

360 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  $(3, 1)$

361 Solve the following system of equations algebraically for y:

$$2x + 2y = 9$$

$$2x - y = 3$$

362 Solve the following system of equations algebraically:

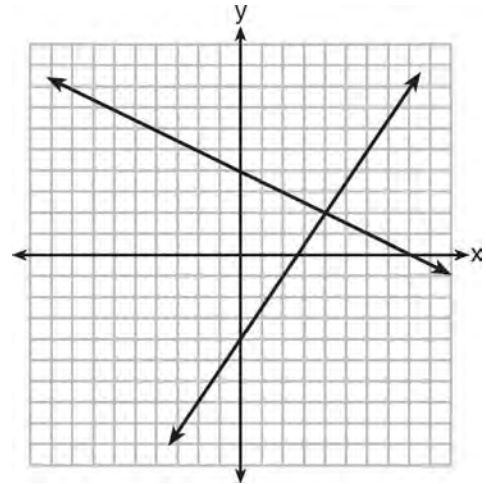
$$3x + 2y = 4$$

$$4x + 3y = 7$$

[Only an algebraic solution can receive full credit.]

A.G.7: SOLVING LINEAR SYSTEMS

363 A system of equations is graphed on the set of axes below.



The solution of this system is

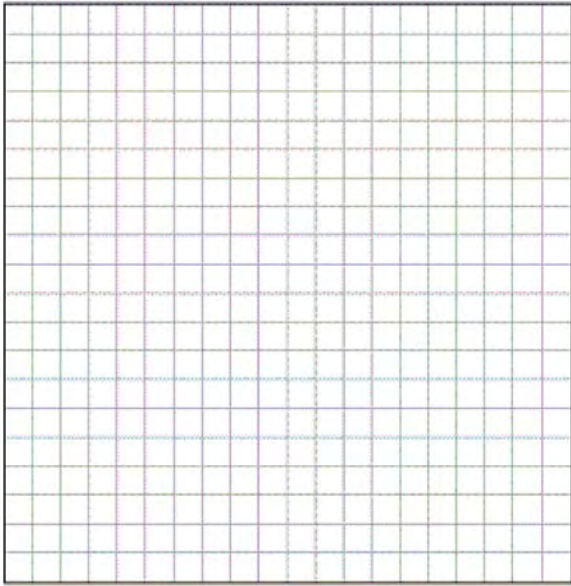
- 1  $(0, 4)$
- 2  $(2, 4)$
- 3  $(4, 2)$
- 4  $(8, 0)$



- 364 On the grid below, solve the system of equations graphically for  $x$  and  $y$ .

$$4x - 2y = 10$$

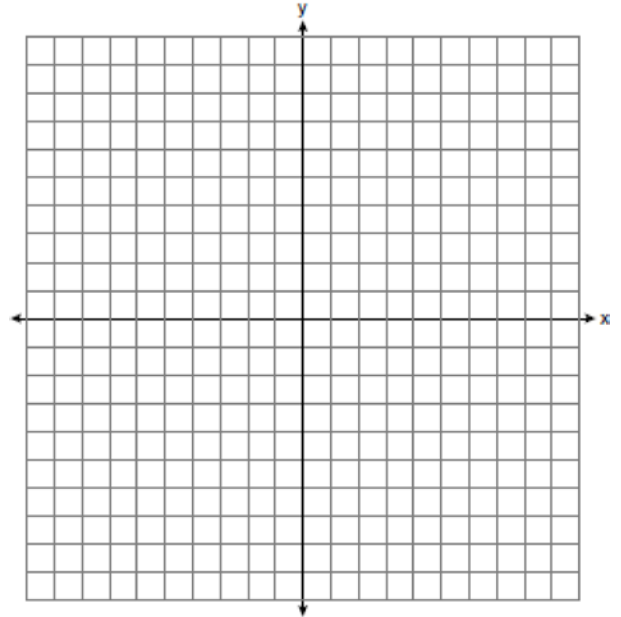
$$y = -2x - 1$$



- 365 On the set of axes below, solve the following system of equations graphically. State the coordinates of the solution.

$$y = 4x - 1$$

$$2x + y = 5$$



A.A.7: WRITING LINEAR SYSTEMS

- 366 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

- 367 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

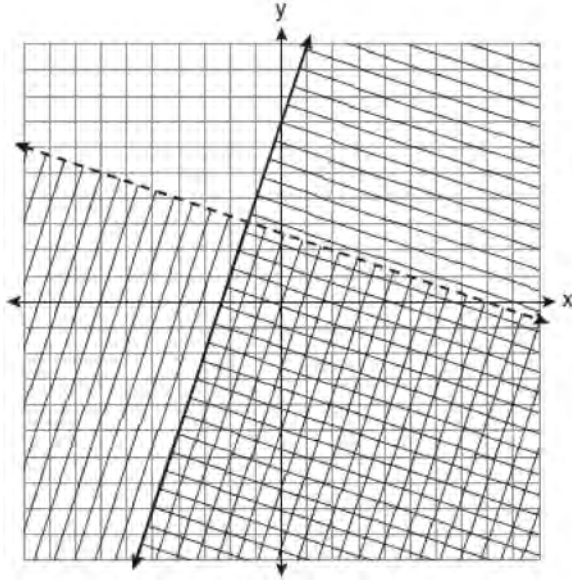
Integrated Algebra Regents Exam Questions by Performance Indicator: Topic

[www.jmap.org](http://www.jmap.org)

- 368 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
- 369 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
- 370 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
- 371 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
- 372 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
- 373 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
- 374 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
- 375 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
- 376 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.

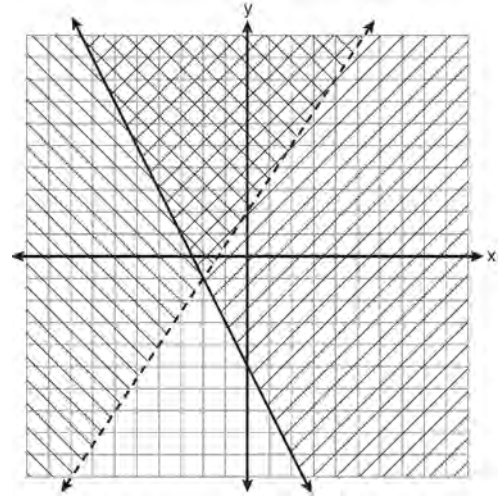
A.A.40: SYSTEMS OF LINEAR INEQUALITIES

377 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)

378 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)

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

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

$$4x + 2y > 3$$

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

380 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)

381 Which ordered pair is in the solution set of the following system of linear inequalities?

$$y < 2x + 2$$

$$y \geq -x - 1$$

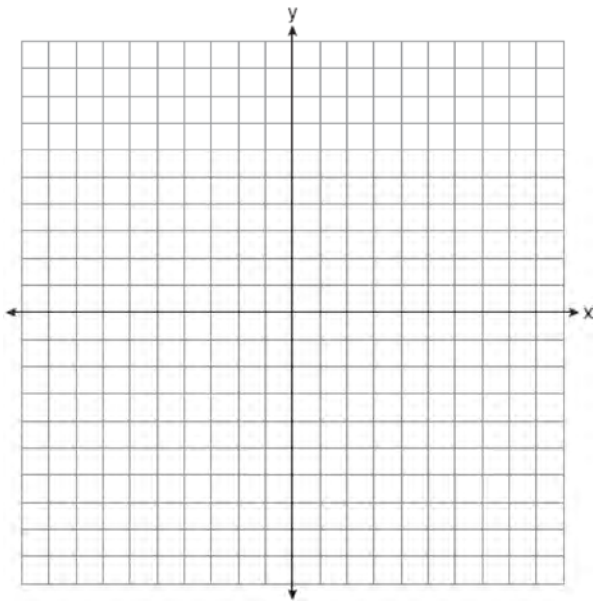
- 1 (0, 3)
- 2 (2, 0)
- 3 (-1, 0)
- 4 (-1, -4)

**A.G.7: SYSTEMS OF LINEAR INEQUALITIES**

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

$$2x - y \geq 6$$

$$x > 2$$

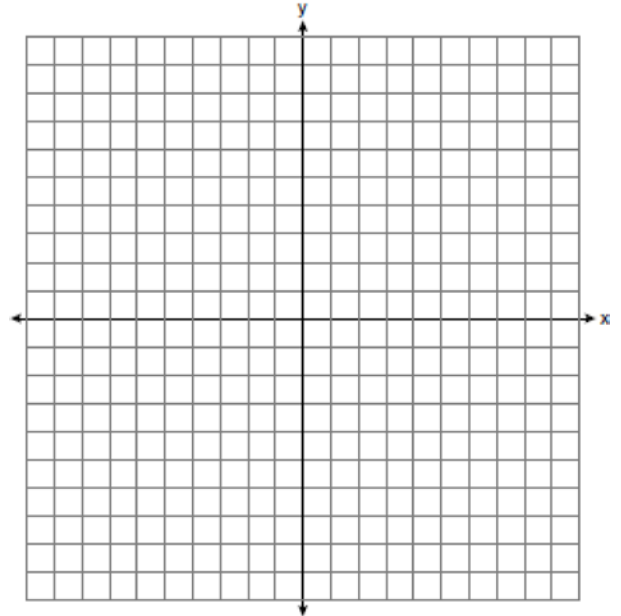


383 On the set of axes below, solve the following system of inequalities graphically.

$$y < 2x + 1$$

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

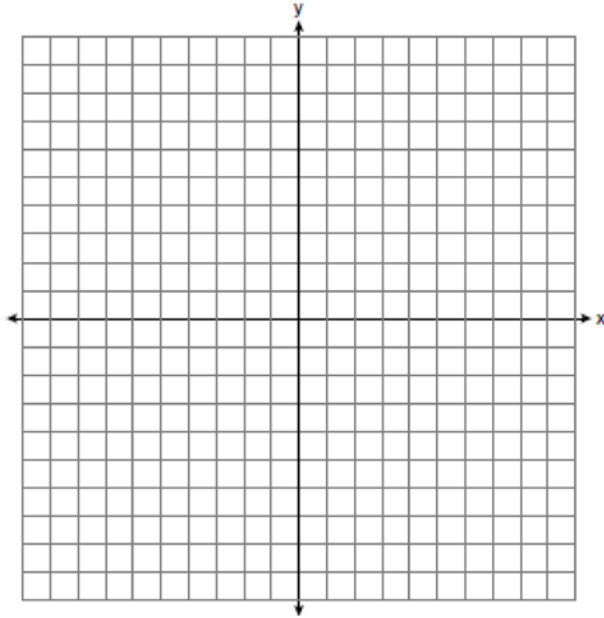
State the coordinates of a point in the solution set.



384 Graph the following systems of inequalities on the set of axes shown below and label the solution set  $S$ :

$$y > -x + 2$$

$$y \leq \frac{2}{3}x + 5$$

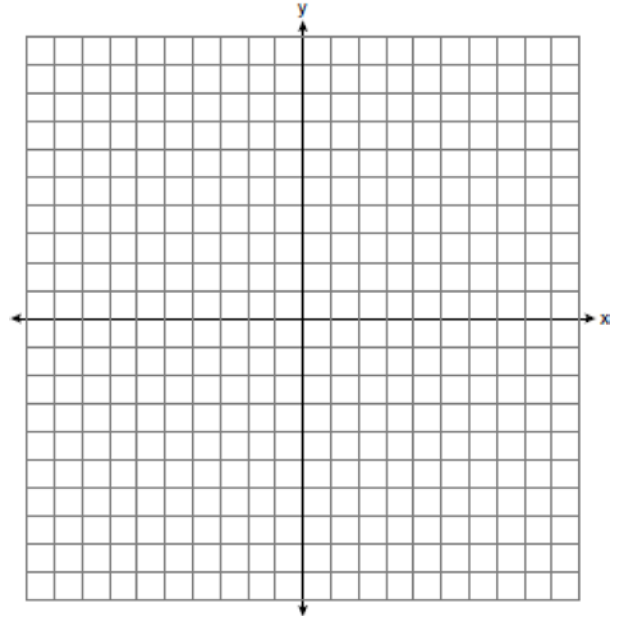


385 Solve the following system of inequalities graphically on the set of axes below.

$$3x + y < 7$$

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

State the coordinates of a point in the solution set.

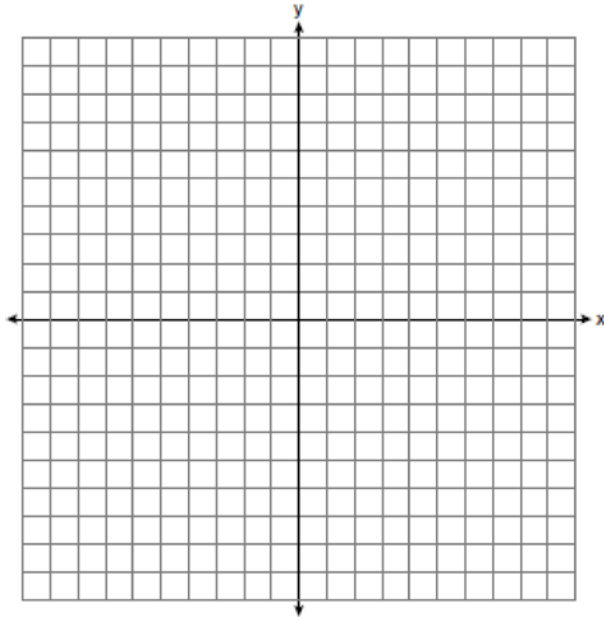


- 386 On the set of axes below, graph the following system of inequalities.

$$y + x \geq 3$$

$$5x - 2y > 10$$

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

- 387 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  $(2, 2)$
- 388 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  $(5, 2)$

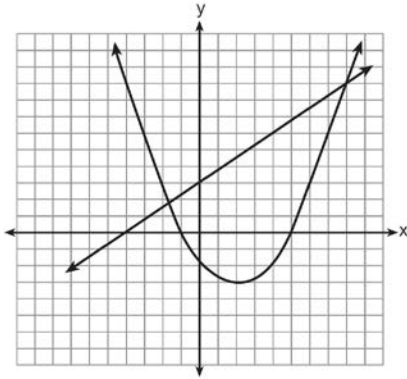
- 389 Which ordered pair is a solution of the system of equations  $y = x^2 - x - 20$  and  $y = 3x - 15$ ?
- 1  $(-5, -30)$
  - 2  $(-1, -18)$
  - 3  $(0, 5)$
  - 4  $(5, -1)$
- 390 Which ordered pair is a solution to the system of equations  $y = x + 3$  and  $y = x^2 - x$ ?
- 1  $(6, 9)$
  - 2  $(3, 6)$
  - 3  $(3, -1)$
  - 4  $(2, 5)$
- 391 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  $\{(-5, 10), (6, -1)\}$
- 392 Solve the following system of equations algebraically for *all* values of  $x$  and  $y$ .

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

$$y = 2x + 1$$

A.G.9: QUADRATIC-LINEAR SYSTEMS

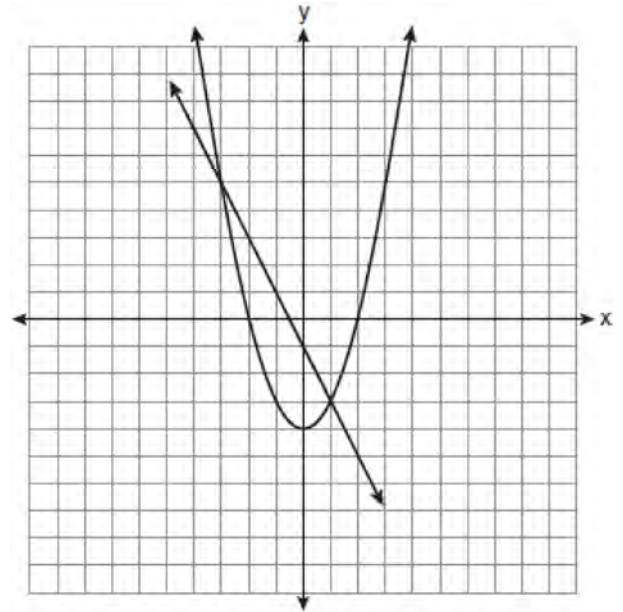
393 Two equations were graphed on the set of axes below.



Which point is a solution of the system of equations shown on the graph?

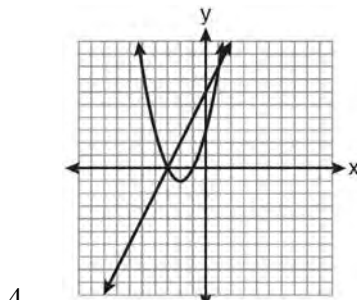
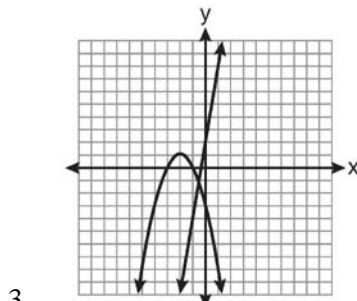
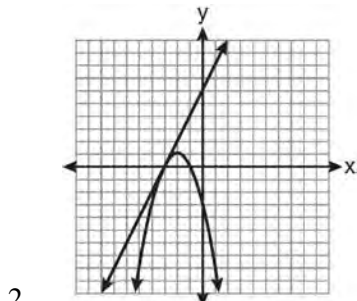
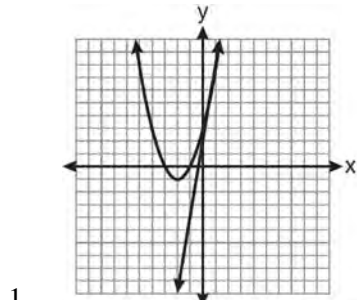
- 1 (8, 9)
- 2 (5, 0)
- 3 (0, 3)
- 4 (2, -3)

394 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)

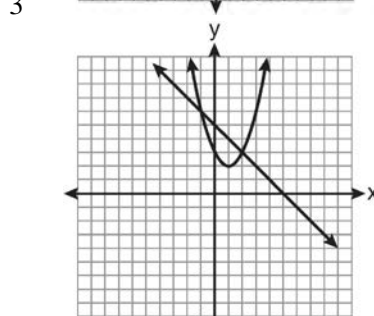
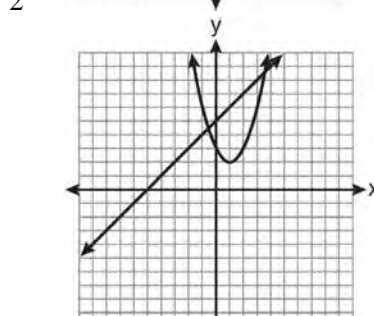
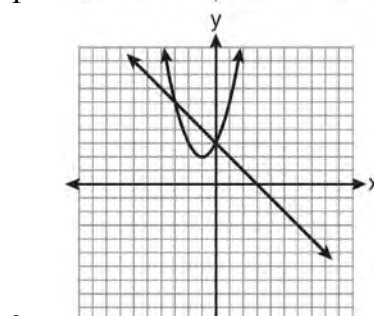
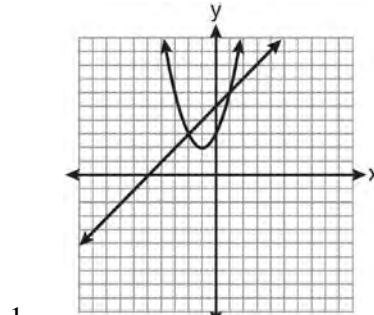
395 Which graph could be used to find the solution of the system of equations  $y = 2x + 6$  and  $y = x^2 + 4x + 3$ ?



396 Which graph can be used to find the solution of the following system of equations?

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

$$2y - 2x = 10$$

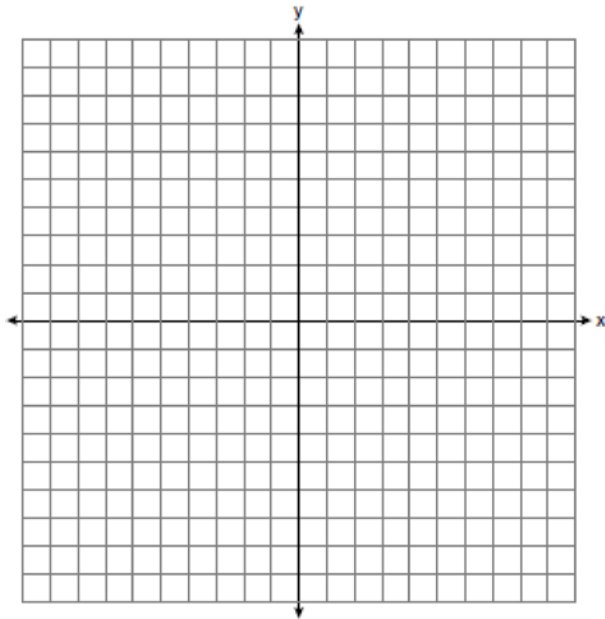




- 397 Solve the following systems of equations graphically, on the set of axes below, and state the coordinates of the point(s) in the solution set.

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

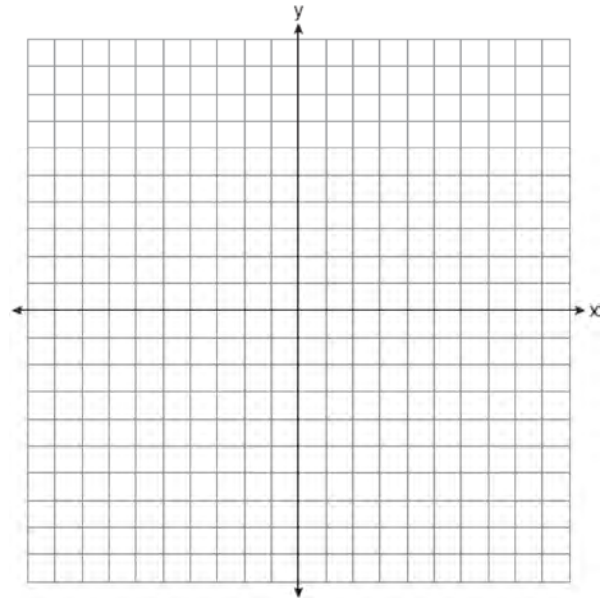
$$2x + y = 5$$



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

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

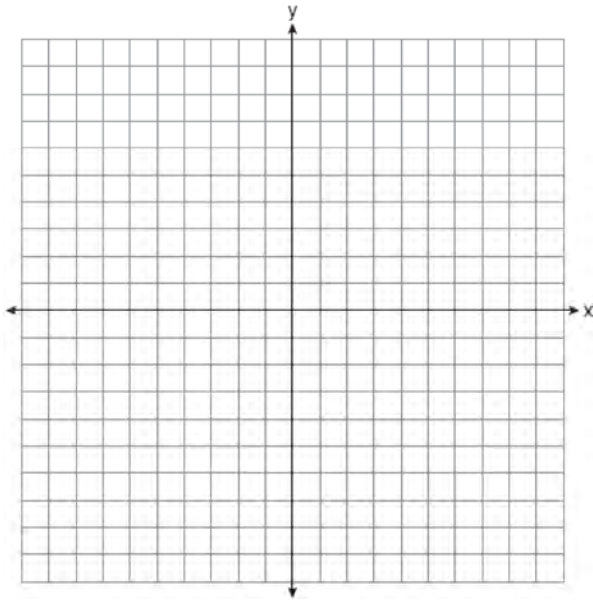
$$y = x - 1$$



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

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

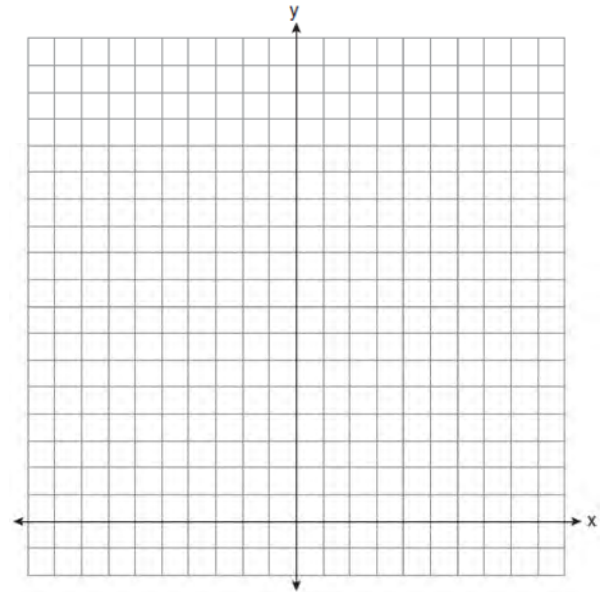
$$y + 2x = 6$$



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

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

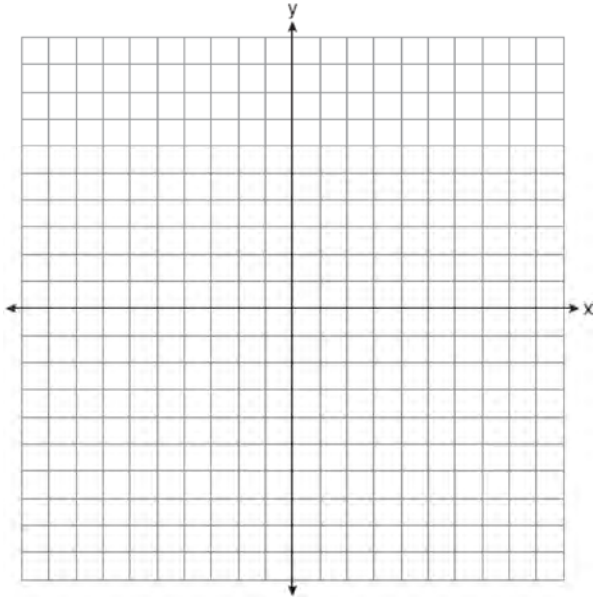
$$y = -2x + 4$$



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

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

$$x + y = 7$$



A.A.13: ADDITION AND SUBTRACTION OF MONOMIALS

- 402 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

- 403 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  $10g^2 + g + 1$

- 404 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  $-5x^2 + 9x - 8$

- 405 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  $7x^6 + 9x^4 - 3x^2 - 8$

- 406 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  $x^2 - 4xy - 4$

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

- 1 0
- 2  $10x$
- 3  $8y$
- 4  $-8y$

- 408 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  $-8x^4 - 13x^2 + 13$

409 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  $x^2 - 6x - 6$

410 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  $4x^2 + 2x - 15$

A.A.13: MULTIPLICATION OF POLYNOMIALS

411 What is the product of  $-3x^2y$  and  $(5xy^2 + xy)$ ?

- 1  $-15x^3y^3 - 3x^3y^2$
- 2  $-15x^3y^3 - 3x^3y$
- 3  $-15x^2y^2 - 3x^2y$
- 4  $-15x^3y^3 + xy$

412 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

413 Which expression represents  $\frac{12x^3 - 6x^2 + 2x}{2x}$  in simplest form?

- 1  $6x^2 - 3x$
- 2  $10x^2 - 4x$
- 3  $6x^2 - 3x + 1$
- 4  $10x^2 - 4x + 1$

414 The quotient of  $\frac{8x^5 - 2x^4 + 4x^3 - 6x^2}{2x^2}$  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  $4x^3 - x^2 + 2x - 3$

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

A.A.12: MULTIPLICATION OF POWERS

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

- 1  $12x^2y^8$
- 2  $12x^2y^6$
- 3  $12x^3y^8$
- 4  $12x^3y^6$

417 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

418 What is one-third of  $3^6$ ?

- 1  $1^2$
- 2  $3^2$
- 3  $3^5$
- 4  $9^6$

419 What is half of  $2^6$ ?

- 1  $1^3$
- 2  $1^6$
- 3  $2^3$
- 4  $2^5$

420 Which expression represents  $\frac{27x^{18}y^5}{9x^6y}$  in simplest

form?

- 1  $3x^{12}y^4$
- 2  $3x^3y^5$
- 3  $18x^{12}y^4$
- 4  $18x^3y^5$

421 Which expression represents  $\frac{-14a^2c^8}{7a^3c^2}$  in simplest

form?

- 1  $-2ac^4$
- 2  $-2ac^6$
- 3  $\frac{-2c^4}{a}$
- 4  $\frac{-2c^6}{a}$

422 The expression  $\frac{12w^9y^3}{-3w^3y^3}$  is equivalent to

- 1  $-4w^6$
- 2  $-4w^3y$
- 3  $9w^6$
- 4  $9w^3y$

423 Which expression represents  $\frac{(2x^3)(8x^5)}{4x^6}$  in

simplest form?

- 1  $x^2$
- 2  $x^9$
- 3  $4x^2$
- 4  $4x^9$

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

A.A.12: POWERS OF POWERS

425 Which expression is equivalent to  $(3x^2)^3$ ?

- 1  $9x^5$
- 2  $9x^6$
- 3  $27x^5$
- 4  $27x^6$

426 The expression  $\frac{(10w^3)^2}{5w}$  is equivalent to

- 1  $2w^5$
- 2  $2w^8$
- 3  $20w^5$
- 4  $20w^8$

427 The expression  $\frac{(4x^3)^2}{2x}$  is equivalent to

- 1  $4x^4$
- 2  $4x^5$
- 3  $8x^4$
- 4  $8x^5$

A.N.4: OPERATIONS WITH SCIENTIFIC NOTATION

428 What is the quotient of  $8.05 \times 10^6$  and  $3.5 \times 10^2$ ?

- 1  $2.3 \times 10^3$
- 2  $2.3 \times 10^4$
- 3  $2.3 \times 10^8$
- 4  $2.3 \times 10^{12}$

429 What is the product of  $8.4 \times 10^8$  and  $4.2 \times 10^3$  written in scientific notation?

- 1  $2.0 \times 10^5$
- 2  $12.6 \times 10^{11}$
- 3  $35.28 \times 10^{11}$
- 4  $3.528 \times 10^{12}$

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- 430 What is the product of 12 and  $4.2 \times 10^6$  expressed in scientific notation?
- 1  $50.4 \times 10^6$
  - 2  $50.4 \times 10^7$
  - 3  $5.04 \times 10^6$
  - 4  $5.04 \times 10^7$
- 431 The quotient of  $(9.2 \times 10^6)$  and  $(2.3 \times 10^2)$  expressed in scientific notation is
- 1 4,000
  - 2 40,000
  - 3  $4 \times 10^3$
  - 4  $4 \times 10^4$
- 432 What is the product of  $(6 \times 10^3)$ ,  $(4.6 \times 10^5)$ , and  $(2 \times 10^{-2})$  expressed in scientific notation?
- 1  $55.2 \times 10^6$
  - 2  $5.52 \times 10^7$
  - 3  $55.2 \times 10^7$
  - 4  $5.52 \times 10^{10}$
- 433 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.
- 434 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  $v = 21,000(0.86)(3)$
- 435 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  $t = 64(0.5)^r$
- 436 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

A.A.9: EXPONENTIAL FUNCTIONS

- 434 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

- 438 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  $\frac{1}{12}$
- 439 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
- 440 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

- 441 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

- 442 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  $2500(1 + 0.4)^3$

- 443 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  $V = 12,500(1.45)^5$

- 444 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?

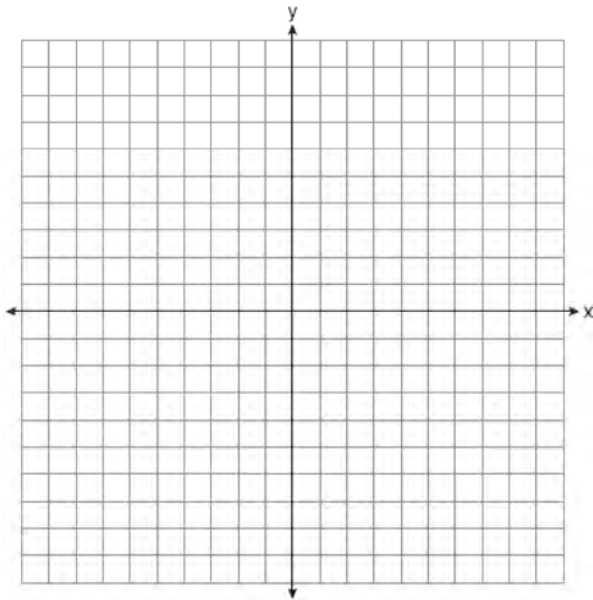
- 1 exponential growth and 12%
- 2 exponential growth and 88%
- 3 exponential decay and 12%
- 4 exponential decay and 88%

445 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.

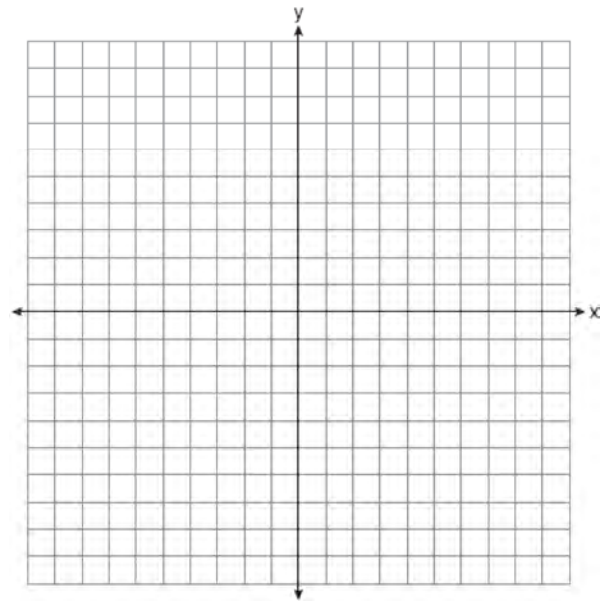
446 The Booster Club raised \$30,000 for a sports fund. No more money will be placed into the fund. Each year the fund will decrease by 5%. Determine the amount of money, to the *nearest cent*, that will be left in the sports fund after 4 years.

A.G.4: GRAPHING EXPONENTIAL FUNCTIONS

447 On the set of axes below, draw the graph of  $y = 2^x$  over the interval  $-1 \leq x \leq 3$ . Will this graph ever intersect the  $x$ -axis? Justify your answer.



448 On the set of axes below, graph  $y = 3^x$  over the interval  $-1 \leq x \leq 2$ .



**RADICALS**

A.N.2: SIMPLIFYING RADICALS

449 What is  $\frac{\sqrt{32}}{4}$  expressed in simplest radical form?

- 1  $\sqrt{2}$
- 2  $4\sqrt{2}$
- 3  $\sqrt{8}$
- 4  $\frac{\sqrt{8}}{2}$

450 What is  $\sqrt{72}$  expressed in simplest radical form?

- 1  $2\sqrt{18}$
- 2  $3\sqrt{8}$
- 3  $6\sqrt{2}$
- 4  $8\sqrt{3}$



451 What is  $\sqrt{32}$  expressed in simplest radical form?

- 1  $16\sqrt{2}$
- 2  $4\sqrt{2}$
- 3  $4\sqrt{8}$
- 4  $2\sqrt{8}$

452 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

453 What is  $3\sqrt{250}$  expressed in simplest radical form?

- 1  $5\sqrt{10}$
- 2  $8\sqrt{10}$
- 3  $15\sqrt{10}$
- 4  $75\sqrt{10}$

454 What is  $2\sqrt{45}$  expressed in simplest radical form?

- 1  $3\sqrt{5}$
- 2  $5\sqrt{5}$
- 3  $6\sqrt{5}$
- 4  $18\sqrt{5}$

455 Express  $5\sqrt{72}$  in simplest radical form.

456 Express  $-3\sqrt{48}$  in simplest radical form.

A.N.3: OPERATIONS WITH RADICALS

457 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  $36\sqrt{2}$

458 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  $\sqrt{6}$

459 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  $7\sqrt{2}$

460 Express  $\frac{16\sqrt{21}}{2\sqrt{7}} - 5\sqrt{12}$  in simplest radical form.

461 Express  $\frac{3\sqrt{75} + \sqrt{27}}{3}$  in simplest radical form.

462 Express the product of  $3\sqrt{20}(2\sqrt{5} - 7)$  in simplest radical form.

**RATIONALS**

A.A.16: RATIONAL EXPRESSIONS

463 The expression  $\frac{9x^4 - 27x^6}{3x^3}$  is equivalent to

- 1  $3x(1 - 3x)$
- 2  $3x(1 - 3x^2)$
- 3  $3x(1 - 9x^5)$
- 4  $9x^3(1 - x)$

464 Which expression represents  $\frac{2x^2 - 12x}{x - 6}$  in simplest form?

- 1 0
- 2  $2x$
- 3  $4x$
- 4  $2x + 2$

465 Which expression represents  $\frac{25x - 125}{x^2 - 25}$  in simplest form?

- 1  $\frac{5}{x}$
- 2  $\frac{-5}{x}$
- 3  $\frac{25}{x - 5}$
- 4  $\frac{25}{x + 5}$

466 Which expression represents  $\frac{x^2 - 2x - 15}{x^2 + 3x}$  in simplest form?

- 1  $-5$
- 2  $\frac{x - 5}{x}$
- 3  $\frac{-2x - 5}{x}$
- 4  $\frac{-2x - 15}{3x}$

467 Which expression represents  $\frac{x^2 - x - 6}{x^2 - 5x + 6}$  in simplest form?

- 1  $\frac{x + 2}{x - 2}$
- 2  $\frac{-x - 6}{-5x + 6}$
- 3  $\frac{1}{5}$
- 4  $-1$

468 Which expression represents  $\frac{x^2 - 3x - 10}{x^2 - 25}$  in simplest form?

- 1  $\frac{2}{5}$
- 2  $\frac{x + 2}{x + 5}$
- 3  $\frac{x - 2}{x - 5}$
- 4  $\frac{-3x - 10}{-25}$

469 Which expression is equivalent to  $\frac{2x^6 - 18x^4 + 2x^2}{2x^2}$ ?

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

470 Express in simplest form:  $\frac{x^2 - 1}{x^2 + 3x + 2}$

471 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.

A.A.15: UNDEFINED RATIONALS

472 For which value of  $x$  is  $\frac{x - 3}{x^2 - 4}$  undefined?

- 1  $-2$
- 2  $0$
- 3  $3$
- 4  $4$

473 Which value of  $x$  makes the expression  $\frac{x+4}{x-3}$

undefined?

- 1 -4
- 2 -3
- 3 3
- 4 0

474 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

475 Which value of  $n$  makes the expression  $\frac{5n}{2n-1}$

undefined?

- 1 1
- 2 0
- 3  $-\frac{1}{2}$
- 4  $\frac{1}{2}$

476 Which value of  $x$  makes the expression

$\frac{x^2-9}{x^2+7x+10}$  undefined?

- 1 -5
- 2 2
- 3 3
- 4 -3

477 The algebraic expression  $\frac{x-2}{x^2-9}$  is undefined when

$x$  is

- 1 0
- 2 2
- 3 3
- 4 9

478 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  $\{-2, 6\}$

479 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

480 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

A.A.18: MULTIPLICATION AND DIVISION OF RATIONALS

481 What is the product of  $\frac{x^2-1}{x+1}$  and  $\frac{x+3}{3x-3}$  expressed in simplest form?

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

**Integrated Algebra Regents Exam Questions by Performance Indicator: Topic**

482 What is the product of  $\frac{4x}{x-1}$  and  $\frac{x^2-1}{3x+3}$  expressed in simplest form?

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

483 What is the quotient of  $\frac{x}{x+4}$  divided by  $\frac{2x}{x^2-16}$ ?

- 1  $\frac{2}{x-4}$
- 2  $\frac{2x^2}{x-4}$
- 3  $\frac{2x^2}{x^2-16}$
- 4  $\frac{x-4}{2}$

484 Express the product of  $\frac{x+2}{2}$  and  $\frac{4x+20}{x^2+6x+8}$  in simplest form.

485 Perform the indicated operation and simplify:

$$\frac{3x+6}{4x+12} \div \frac{x^2-4}{x+3}$$

486 Express in simplest form:  $\frac{2x^2-8x-42}{6x^2} \div \frac{x^2-9}{x^2-3x}$

487 Express in simplest form:

$$\frac{x^2+9x+14}{x^2-49} \div \frac{3x+6}{x^2+x-56}$$

A.A.17: ADDITION AND SUBTRACTION OF RATIONALS

488 What is the sum of  $\frac{d}{2}$  and  $\frac{2d}{3}$  expressed in simplest form?

- 1  $\frac{3d}{5}$
- 2  $\frac{3d}{6}$
- 3  $\frac{7d}{5}$
- 4  $\frac{7d}{6}$

489 What is  $\frac{6}{5x} - \frac{2}{3x}$  in simplest form?

- 1  $\frac{8}{15x^2}$
- 2  $\frac{8}{15x}$
- 3  $\frac{4}{15x}$
- 4  $\frac{4}{2x}$

490 What is  $\frac{6}{4a} - \frac{2}{3a}$  expressed in simplest form?

- 1  $\frac{4}{a}$
- 2  $\frac{5}{6a}$
- 3  $\frac{8}{7a}$
- 4  $\frac{10}{12a}$

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491 What is the sum of  $\frac{3}{2x}$  and  $\frac{4}{3x}$  expressed in simplest form?

- 1  $\frac{12}{6x^2}$
- 2  $\frac{17}{6x}$
- 3  $\frac{7}{5x}$
- 4  $\frac{17}{12x}$

492 What is the sum of  $\frac{3x^2}{x-2}$  and  $\frac{x^2}{x-2}$ ?

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

493 What is the sum of  $\frac{-x+7}{2x+4}$  and  $\frac{2x+5}{2x+4}$ ?

- 1  $\frac{x+12}{2x+4}$
- 2  $\frac{3x+12}{2x+4}$
- 3  $\frac{x+12}{4x+8}$
- 4  $\frac{3x+12}{4x+8}$

494 What is  $\frac{2+x}{5x} - \frac{x-2}{5x}$  expressed in simplest form?

- 1 0
- 2  $\frac{2}{5}$
- 3  $\frac{4}{5x}$
- 4  $\frac{2x+4}{5x}$

495 What is the sum of  $\frac{3}{2x}$  and  $\frac{7}{4x}$ ?

- 1  $\frac{21}{8x^2}$
- 2  $\frac{13}{4x}$
- 3  $\frac{10}{6x}$
- 4  $\frac{13}{8x}$

496 What is  $\frac{7}{12x} - \frac{y}{6x^2}$  expressed in simplest form?

- 1  $\frac{7-y}{6x}$
- 2  $\frac{7-y}{12x-6x^2}$
- 3  $-\frac{7y}{12x^2}$
- 4  $\frac{7x-2y}{12x^2}$

497 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  $\frac{2y+10}{y+5}$

498 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  $\frac{5x+7}{4x+12}$

A.A.26: SOLVING RATIONALS

499 Which value of  $x$  is a solution of  $\frac{5}{x} = \frac{x+13}{6}$ ?

- 1 -2
- 2 -3
- 3 -10
- 4 -15

500 What is the solution of  $\frac{k+4}{2} = \frac{k+9}{3}$ ?

- 1 1
- 2 5
- 3 6
- 4 14

501 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

502 What is the solution set of  $\frac{x+2}{x-2} = \frac{-3}{x}$ ?

- 1  $\{-2, 3\}$
- 2  $\{-3, -2\}$
- 3  $\{-1, 6\}$
- 4  $\{-6, 1\}$

503 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

504 What is the solution of  $\frac{2}{x+1} = \frac{x+1}{2}$ ?

- 1 -1 and -3
- 2 -1 and 3
- 3 1 and -3
- 4 1 and 3

505 Solve for  $x$ :  $\frac{x+1}{x} = \frac{-7}{x-12}$

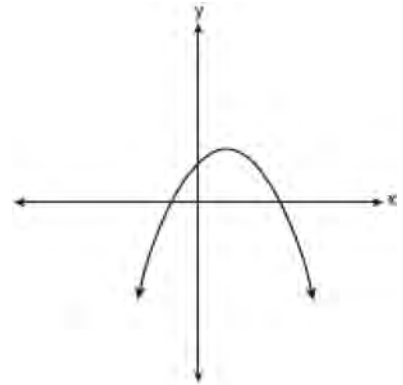
506 Solve algebraically for  $x$ :  $\frac{x+2}{6} = \frac{3}{x-1}$

507 Solve algebraically for  $x$ :  $\frac{3}{4} = \frac{-(x+11)}{4x} + \frac{1}{2x}$

**FUNCTIONS**

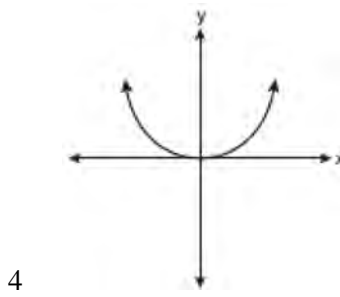
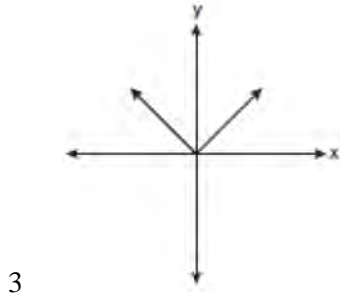
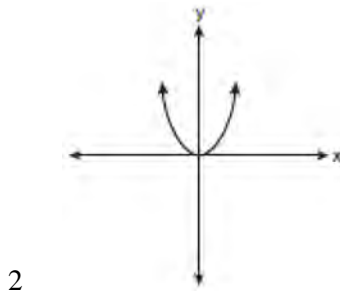
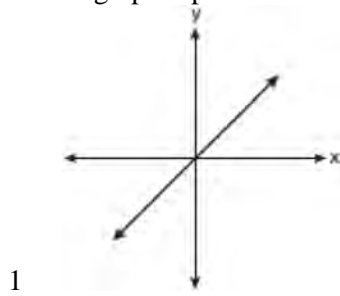
A.G.4: FAMILIES OF FUNCTIONS

508 Which type of graph is shown in the diagram below?

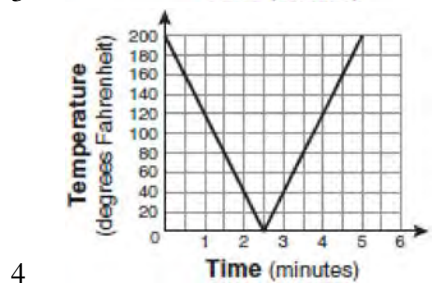
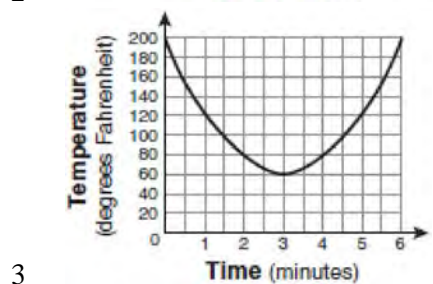
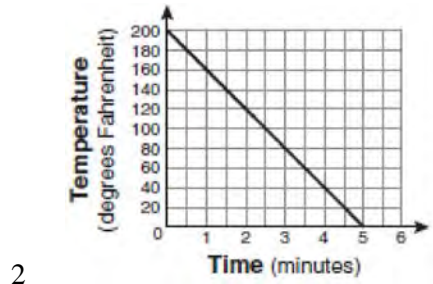
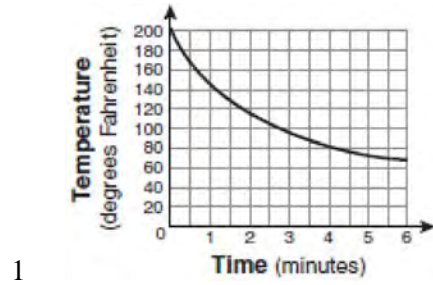


- 1 absolute value
- 2 exponential
- 3 linear
- 4 quadratic

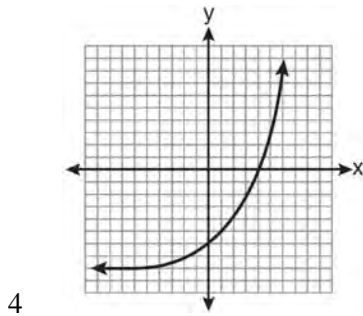
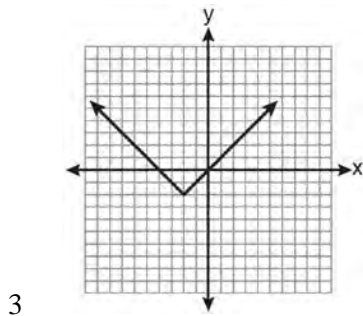
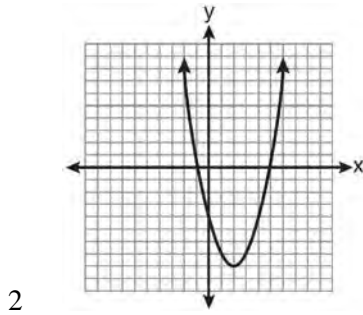
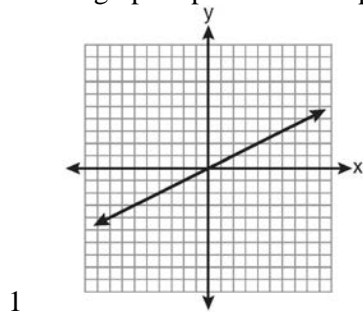
509 Which graph represents a linear function?



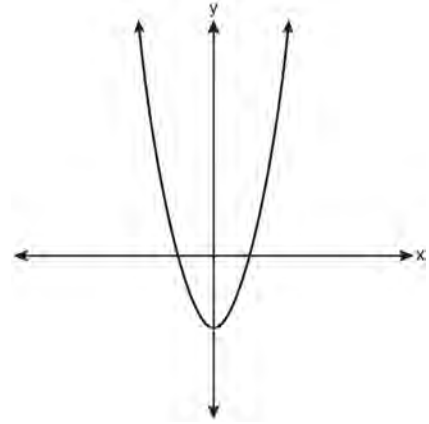
510 Antwaan leaves a cup of hot chocolate on the counter in his kitchen. Which graph is the best representation of the change in temperature of his hot chocolate over time?



511 Which graph represents an exponential equation?



512 Which type of function is represented by the graph shown below?



- 1 absolute value
- 2 exponential
- 3 linear
- 4 quadratic

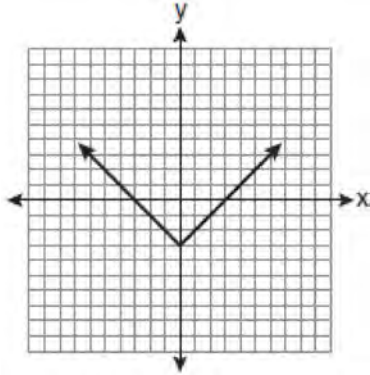
513 Which equation represents a quadratic function?

- 1  $y = x + 2$
- 2  $y = |x + 2|$
- 3  $y = x^2$
- 4  $y = 2^x$



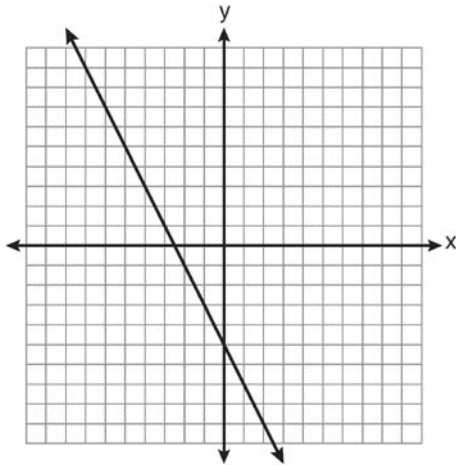
A.G.4: IDENTIFYING THE EQUATION OF A GRAPH

514 Which equation is represented by the graph below?



- 1  $y = x^2 - 3$
- 2  $y = (x - 3)^2$
- 3  $y = |x| - 3$
- 4  $y = |x - 3|$

515 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

516 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  $\{(-1, 2), (0, 5), (5, 0), (2, -1)\}$

517 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  $\{(-6, 5), (-3, 2), (1, 2), (6, 5)\}$

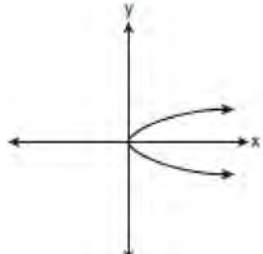
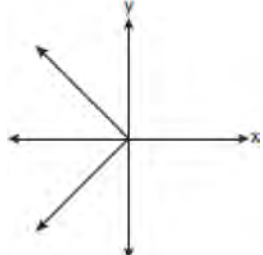
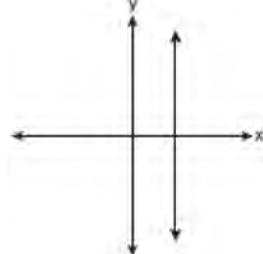
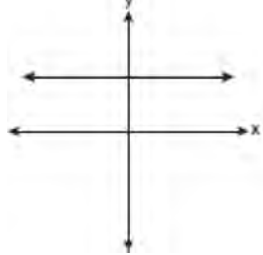
518 Which set of ordered pairs represents a function?

- 1  $\{(0, 4), (2, 4), (2, 5)\}$
- 2  $\{(6, 0), (5, 0), (4, 0)\}$
- 3  $\{(4, 1), (6, 2), (6, 3), (5, 0)\}$
- 4  $\{(0, 4), (1, 4), (0, 5), (1, 5)\}$

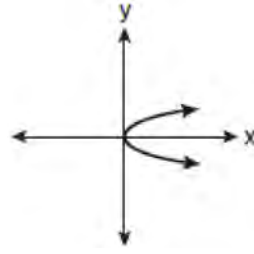
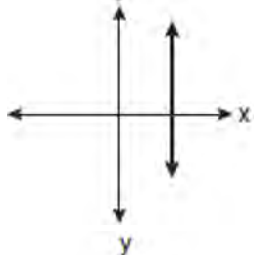
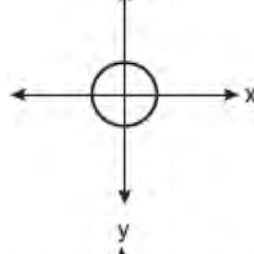
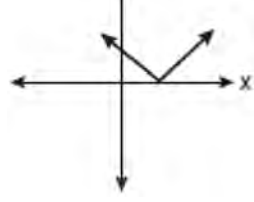
519 Which relation is a function?

- 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  $\{(2, 1), (4, 3), (6, 5)\}$

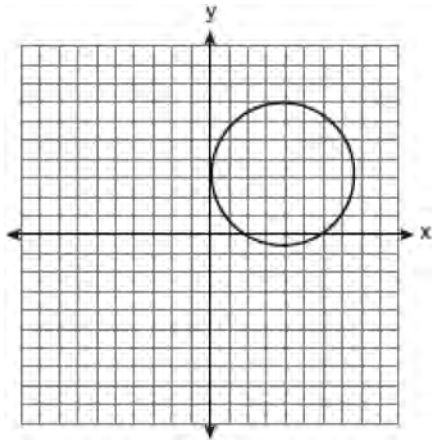
520 Which graph represents a function?

- 1 
- 2 
- 3 
- 4 

521 Which graph represents a function?

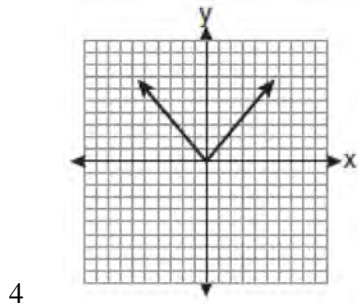
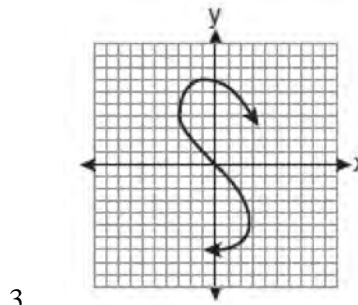
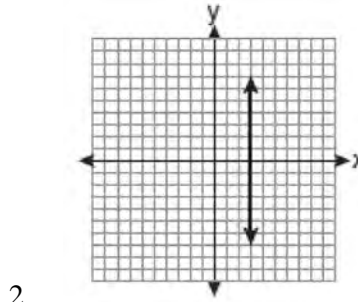
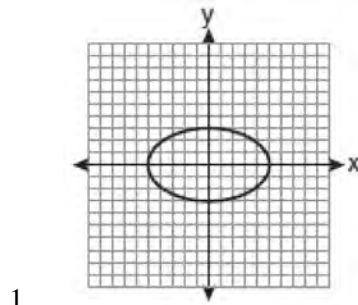
- 1 
- 2 
- 3 
- 4 

522 Which statement is true about the relation shown on the graph below?

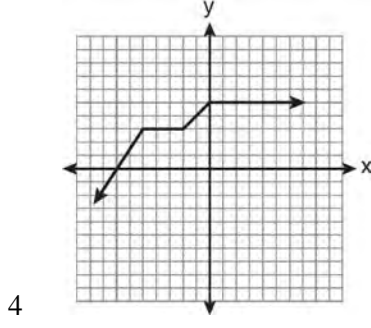
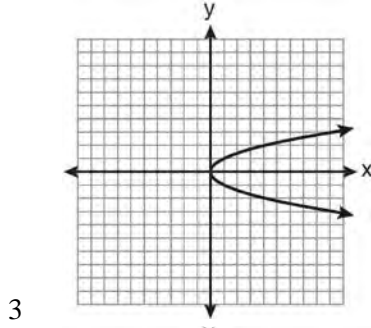
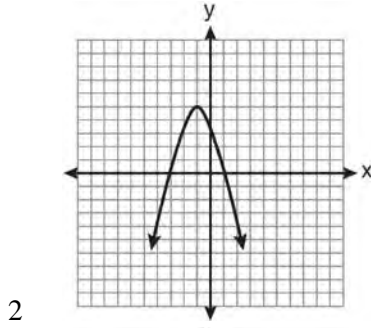
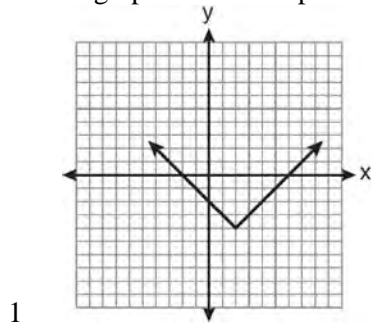


- 1 It is a function because there exists one  $x$ -coordinate for each  $y$ -coordinate.
- 2 It is a function because there exists one  $y$ -coordinate for each  $x$ -coordinate.
- 3 It is *not* a function because there are multiple  $y$ -values for a given  $x$ -value.
- 4 It is *not* a function because there are multiple  $x$ -values for a given  $y$ -value.

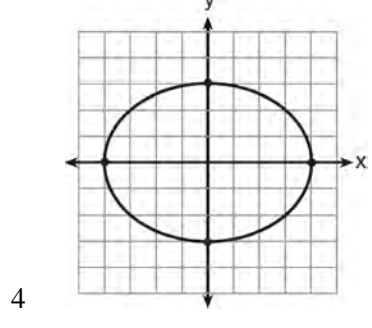
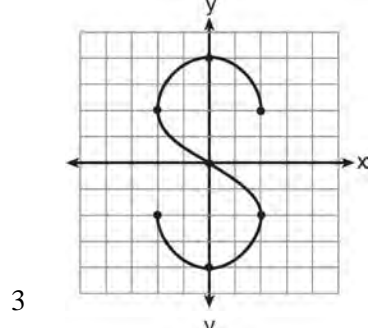
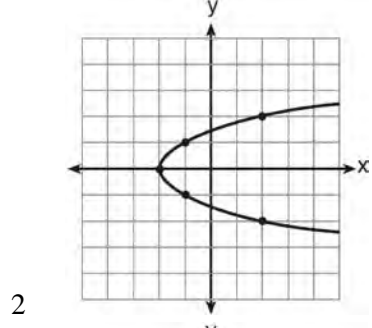
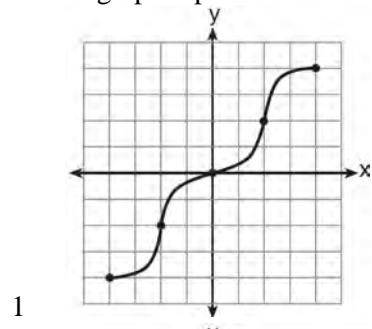
523 Which graph represents a function?



524 Which graph does *not* represent a function?



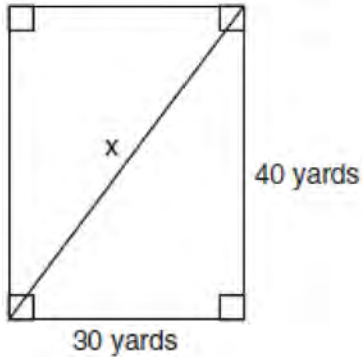
525 Which graph represents a function?



## TRIANGLES

### A.A.45: PYTHAGOREAN THEOREM

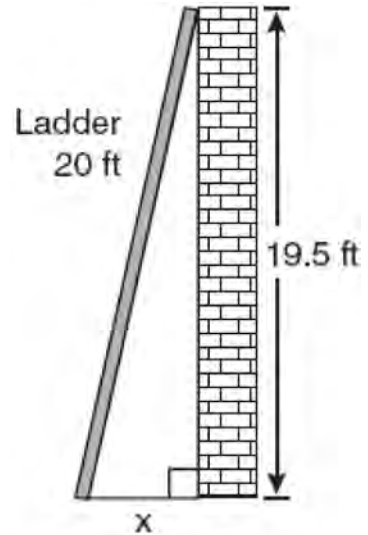
- 526 Tanya runs diagonally across a rectangular field that has a length of 40 yards and a width of 30 yards, as shown in the diagram below.



What is the length of the diagonal, in yards, that Tanya runs?

- 1 50
- 2 60
- 3 70
- 4 80

- 527 Don placed a ladder against the side of his house as shown in the diagram below.



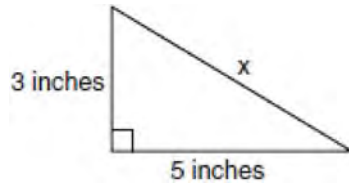
Which equation could be used to find the distance,  $x$ , from the foot of the ladder to the base of the house?

- 1  $x = 20 - 19.5$
- 2  $x = 20^2 - 19.5^2$
- 3  $x = \sqrt{20^2 - 19.5^2}$
- 4  $x = \sqrt{20^2 + 19.5^2}$

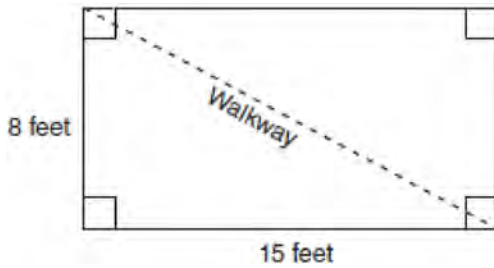
- 528 The length of the hypotenuse of a right triangle is 34 inches and the length of one of its legs is 16 inches. What is the length, in inches, of the other leg of this right triangle?

- 1 16
- 2 18
- 3 25
- 4 30

- 529 What is the value of  $x$ , in inches, in the right triangle below?

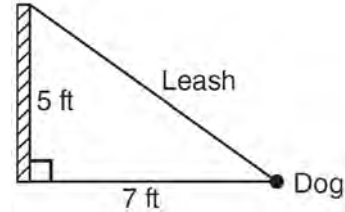


- 1  $\sqrt{15}$
  - 2 8
  - 3  $\sqrt{34}$
  - 4 4
- 530 Nancy's rectangular garden is represented in the diagram below.



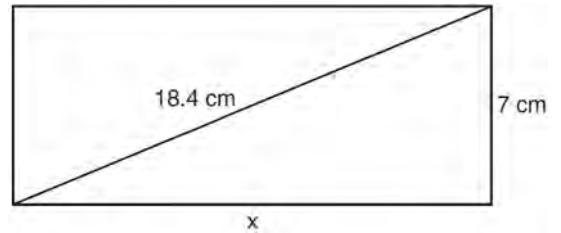
If a diagonal walkway crosses her garden, what is its length, in feet?

- 531 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*?

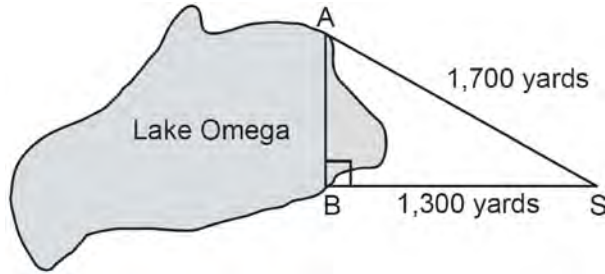
- 1 4.9
  - 2 8.6
  - 3 9.0
  - 4 12.0
- 532 The rectangle shown below has a diagonal of 18.4 cm and a width of 7 cm.



To the *nearest centimeter*, what is the length,  $x$ , of the rectangle?

- 1 11
  - 2 17
  - 3 20
  - 4 25
- 533 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

- 534 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?

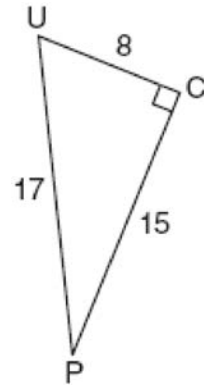
- 1 1,095
  - 2 1,096
  - 3 2,140
  - 4 2,141
- 535 The length of one side of a square is 13 feet. What is the length, to the nearest foot, of a diagonal of the square?
- 1 13
  - 2 18
  - 3 19
  - 4 26

## TRIGONOMETRY

### A.A.42: TRIGONOMETRIC RATIOS

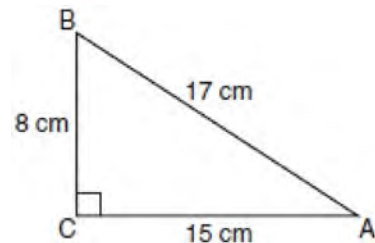
- 536 In triangle  $MCT$ , the measure of  $\angle T = 90^\circ$ ,  $MC = 85$  cm,  $CT = 84$  cm, and  $TM = 13$  cm. Which ratio represents the sine of  $\angle C$ ?
- 1  $\frac{13}{85}$
  - 2  $\frac{84}{85}$
  - 3  $\frac{13}{84}$
  - 4  $\frac{84}{13}$

- 537 The diagram below shows right triangle  $UPC$ .



Which ratio represents the sine of  $\angle U$ ?

- 1  $\frac{15}{8}$
  - 2  $\frac{15}{17}$
  - 3  $\frac{8}{15}$
  - 4  $\frac{8}{17}$
- 538 Which equation shows a correct trigonometric ratio for angle  $A$  in the right triangle below?

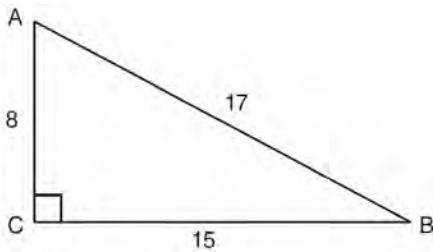


- 1  $\sin A = \frac{15}{17}$
- 2  $\tan A = \frac{8}{17}$
- 3  $\cos A = \frac{15}{17}$
- 4  $\tan A = \frac{5}{8}$

539 In  $\triangle ABC$ , the measure of  $\angle B = 90^\circ$ ,  $AC = 50$ ,  $AB = 48$ , and  $BC = 14$ . Which ratio represents the tangent of  $\angle A$ ?

- 1  $\frac{14}{50}$
- 2  $\frac{14}{48}$
- 3  $\frac{48}{50}$
- 4  $\frac{48}{14}$

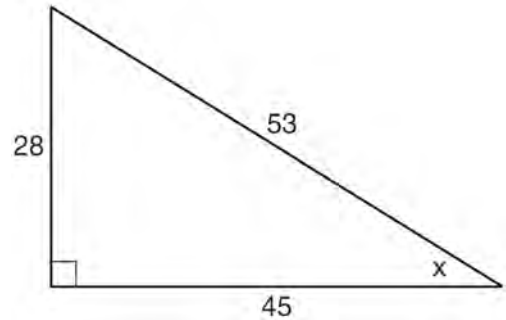
540 Right triangle  $ABC$  has legs of 8 and 15 and a hypotenuse of 17, as shown in the diagram below.



The value of the tangent of  $\angle B$  is

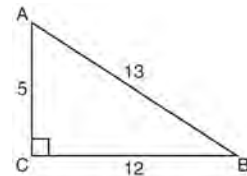
- 1 0.4706
- 2 0.5333
- 3 0.8824
- 4 1.8750

541 Which ratio represents  $\sin x$  in the right triangle shown below?



- 1  $\frac{28}{53}$
- 2  $\frac{28}{45}$
- 3  $\frac{45}{53}$
- 4  $\frac{53}{28}$

542 The diagram below shows right triangle  $ABC$ .

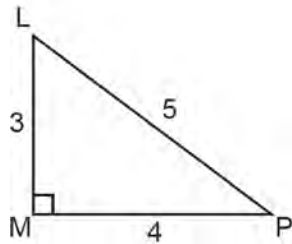


Which ratio represents the tangent of  $\angle ABC$ ?

- 1  $\frac{5}{13}$
- 2  $\frac{5}{12}$
- 3  $\frac{12}{13}$
- 4  $\frac{12}{5}$



543 The diagram below shows right triangle  $LMP$ .



Which ratio represents the tangent of  $\angle PLM$ ?

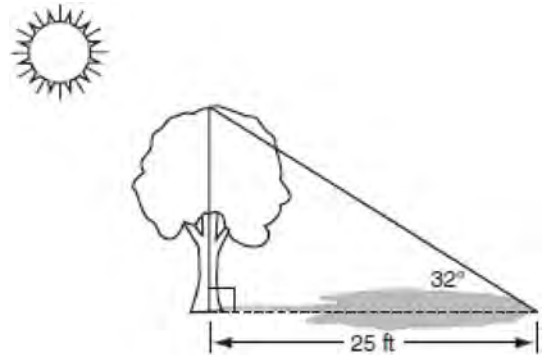
- 1  $\frac{3}{4}$
- 2  $\frac{3}{5}$
- 3  $\frac{4}{3}$
- 4  $\frac{5}{4}$

544 In  $\triangle ABC$ ,  $m\angle C = 90$ . If  $AB = 5$  and  $AC = 4$ , which statement is *not* true?

- 1  $\cos A = \frac{4}{5}$
- 2  $\tan A = \frac{3}{4}$
- 3  $\sin B = \frac{4}{5}$
- 4  $\tan B = \frac{5}{3}$

A.A.44: USING TRIGONOMETRY TO FIND A SIDE

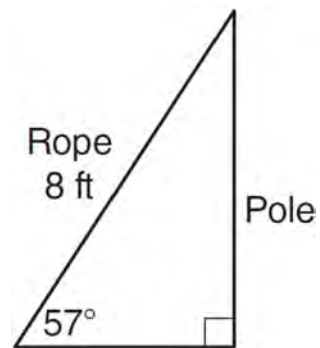
545 A tree casts a 25-foot shadow on a sunny day, as shown in the diagram below.



If the angle of elevation from the tip of the shadow to the top of the tree is  $32^\circ$ , 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

546 An 8-foot rope is tied from the top of a pole to a stake in the ground, as shown in the diagram below.

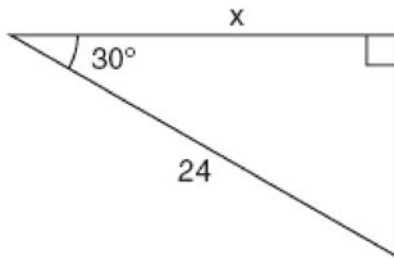


If the rope forms a  $57^\circ$  angle with the ground, what is the height of the pole, to the *nearest tenth of a foot*?

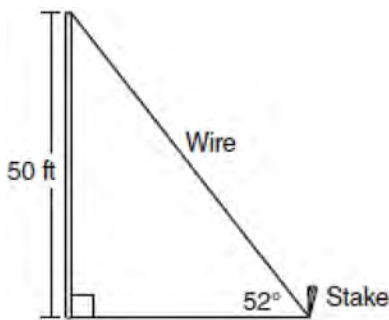
- 1 4.4
- 2 6.7
- 3 9.5
- 4 12.3

- 547 A right triangle contains a  $38^\circ$  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

- 548 In the right triangle shown in the diagram below, what is the value of  $x$  to the *nearest whole number*?

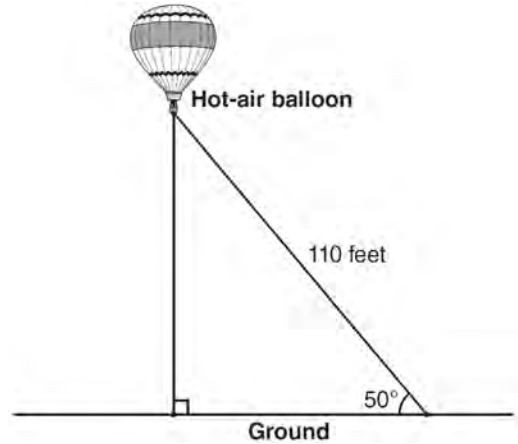


- 1 12
  - 2 14
  - 3 21
  - 4 28
- 549 A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of  $52^\circ$ .



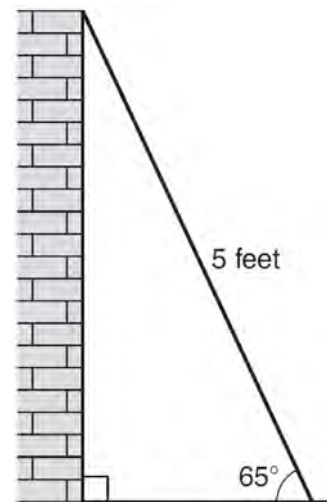
How far away from the base of the pole should the stake be driven in, to the *nearest foot*? What will be the length of the wire from the stake to the top of the pole, to the *nearest foot*?

- 550 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  $50^\circ$  with the ground.



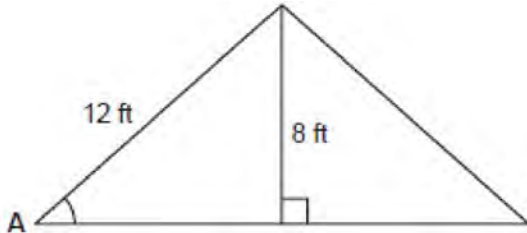
Determine the height, to the *nearest foot*, of the balloon directly above the ground. Determine the distance, to the *nearest foot*, on the ground between the two ropes.

- 551 As shown in the diagram below, a ladder 5 feet long leans against a wall and makes an angle of  $65^\circ$  with the ground. Find, to the *nearest tenth of a foot*, the distance from the wall to the base of the ladder.



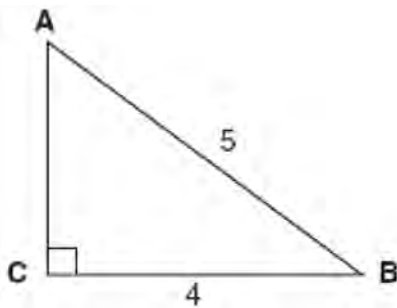
A.A.43: USING TRIGONOMETRY TO FIND AN ANGLE

- 552 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.



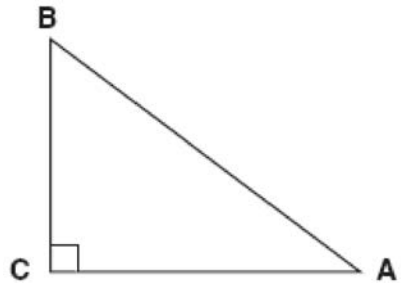
If a right angle is formed where the center pole meets the ground, what is the measure of angle  $A$  to the nearest degree?

- 1 34
  - 2 42
  - 3 48
  - 4 56
- 553 Which equation could be used to find the measure of one acute angle in the right triangle shown below?



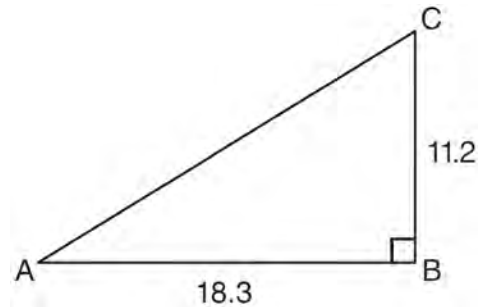
- 1  $\sin A = \frac{4}{5}$
- 2  $\tan A = \frac{5}{4}$
- 3  $\cos B = \frac{5}{4}$
- 4  $\tan B = \frac{4}{5}$

- 554 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?

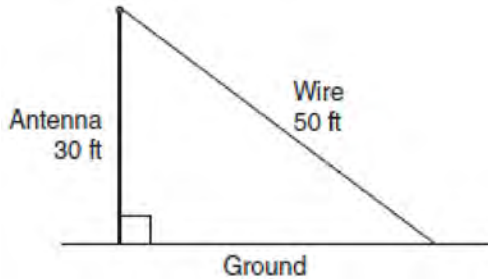
- 1 32.0
  - 2 38.7
  - 3 51.3
  - 4 90.0
- 555 In right triangle  $ABC$  shown below,  $AB = 18.3$  and  $BC = 11.2$ .



What is the measure of  $\angle A$ , to the nearest tenth of a degree?

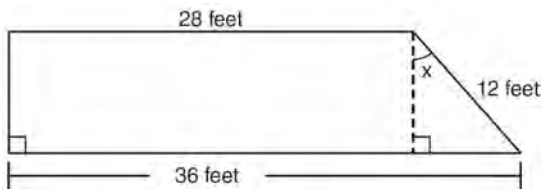
- 1 31.5
  - 2 37.7
  - 3 52.3
  - 4 58.5
- 556 In right triangle  $ABC$ ,  $AB = 20$ ,  $AC = 12$ ,  $BC = 16$ , and  $m\angle C = 90$ . Find, to the nearest degree, the measure of  $\angle A$ .

- 557 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.



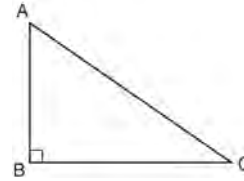
Find, to the *nearest degree*, the measure of the angle that the wire makes with the ground.

- 558 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*.



Calculate the measure of angle  $x$ , to the *nearest tenth of a degree*.

- 560 In right triangle  $ABC$  shown below,  $AC = 29$  inches,  $AB = 17$  inches, and  $m\angle ABC = 90$ . Find the number of degrees in the measure of angle  $BAC$ , to the *nearest degree*.

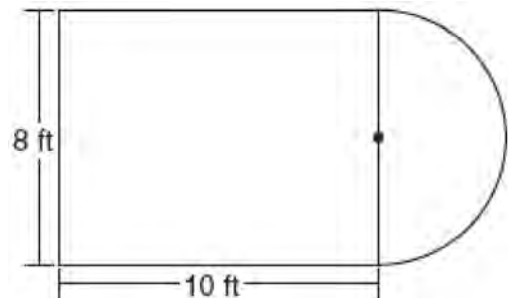


Find the length of  $\overline{BC}$  to the *nearest inch*.

## MEASURING IN THE PLANE AND SPACE

### A.G.1: COMPOSITIONS OF POLYGONS AND CIRCLES

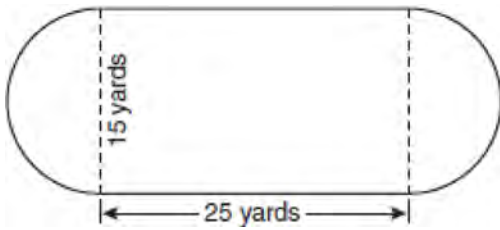
- 561 Luis is going to paint a basketball court on his driveway, as shown in the diagram below. This basketball court consists of a rectangle and a semicircle.



Which expression represents the area of this basketball court, in square feet?

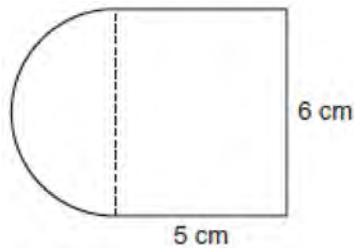
- 1 80
- 2  $80 + 8\pi$
- 3  $80 + 16\pi$
- 4  $80 + 64\pi$

- 562 A playground in a local community consists of a rectangle and two semicircles, as shown in the diagram below.



Which expression represents the amount of fencing, in yards, that would be needed to completely enclose the playground?

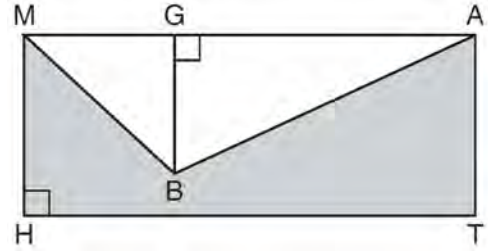
- 1  $15\pi + 50$
  - 2  $15\pi + 80$
  - 3  $30\pi + 50$
  - 4  $30\pi + 80$
- 563 A figure is made up of a rectangle and a semicircle as shown in the diagram below.



What is the area of the figure, to the nearest tenth of a square centimeter?

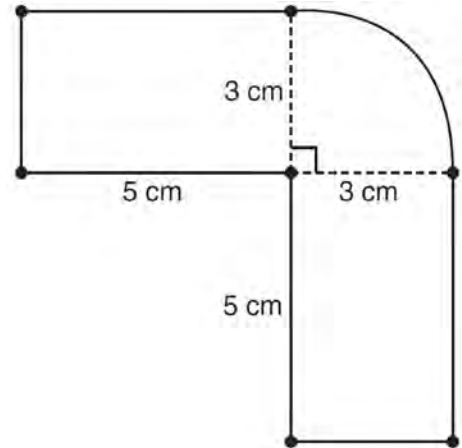
- 1 39.4
- 2 44.1
- 3 48.8
- 4 58.3

- 564 In the diagram below,  $MATH$  is a rectangle,  $GB = 4.6$ ,  $MH = 6$ , and  $HT = 15$ .



What is the area of polygon  $MBATH$ ?

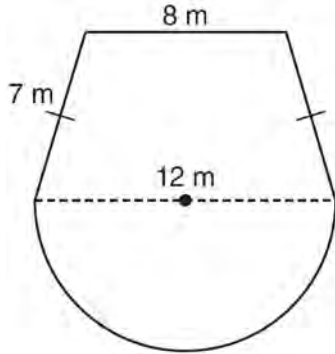
- 1 34.5
  - 2 55.5
  - 3 90.0
  - 4 124.5
- 565 The figure shown below is composed of two rectangles and a quarter circle.



What is the area of this figure, to the nearest square centimeter?

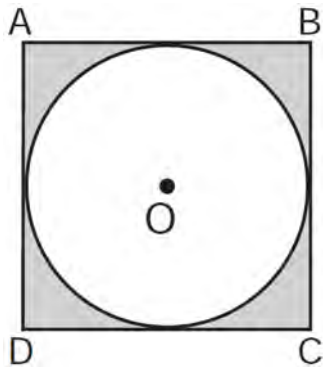
- 1 33
- 2 37
- 3 44
- 4 58

- 566 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?

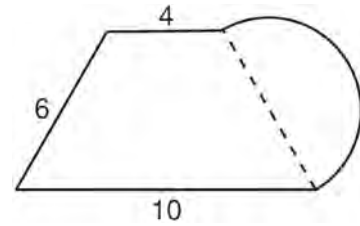
- 1  $22 + 6\pi$
  - 2  $22 + 12\pi$
  - 3  $15 + 6\pi$
  - 4  $15 + 12\pi$
- 567 In the diagram below, circle  $O$  is inscribed in square  $ABCD$ . The square has an area of 36.



What is the area of the circle?

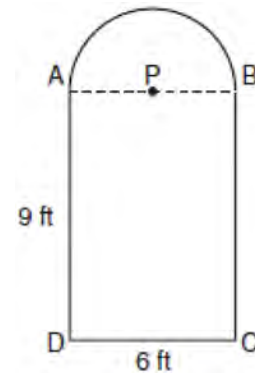
- 1 9?
- 2 6?
- 3 3?
- 4 36?

- 568 What is the perimeter of the figure shown below, which consists of an isosceles trapezoid and a semicircle?



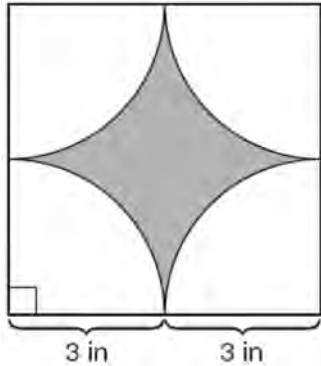
- 1  $20 + 3\pi$
- 2  $20 + 6\pi$
- 3  $26 + 3\pi$
- 4  $26 + 6\pi$

- 569 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.



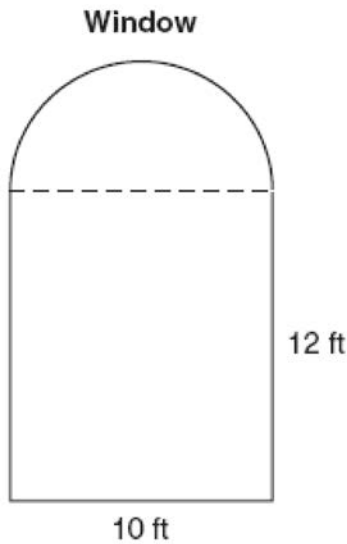
Calculate the length of fence Serena needs to the nearest tenth of a foot.

- 570 A designer created the logo shown below. The logo consists of a square and four quarter-circles of equal size.



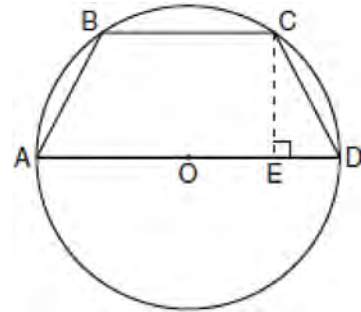
Express, in terms of  $\pi$ , the exact area, in square inches, of the shaded region.

- 571 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.



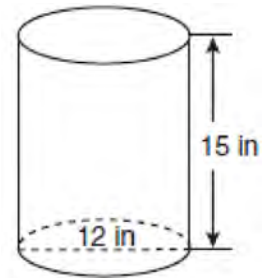
To the *nearest foot*, what is the length of the string of lights that Tess will need to decorate the window?

- 572 In the diagram below, the circumference of circle  $O$  is  $16\pi$  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  $ABCD$ .



A.G.2: VOLUME

- 573 A cylindrical container has a diameter of 12 inches and a height of 15 inches, as illustrated in the diagram below.



(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

574 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

575 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*?

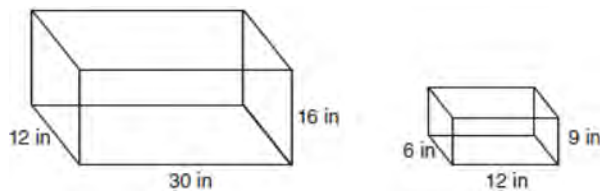
- 1 72.3
- 2 83.1
- 3 180.6
- 4 722.6

576 The volume of a cylindrical can is  $32\pi$  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

577 A soup can is in the shape of a cylinder. The can has a volume of  $342\text{ cm}^3$  and a diameter of 6 cm. Express the height of the can in terms of  $\pi$ . 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.

578 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.

579 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.

A.G.2: SURFACE AREA

580 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?

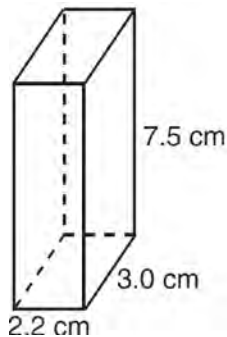
- 1  $9.0\text{ ft}^2$
- 2  $13.5\text{ ft}^2$
- 3  $22.5\text{ ft}^2$
- 4  $27.0\text{ ft}^2$

581 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

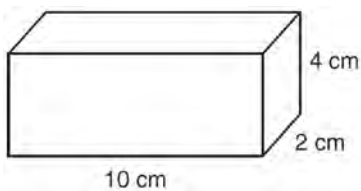


- 582 The rectangular prism shown below has a length of 3.0 cm, a width of 2.2 cm, and a height of 7.5 cm.



What is the surface area, in square centimeters?

- 1 45.6
  - 2 49.5
  - 3 78.0
  - 4 91.2
- 583 Find the volume, in cubic centimeters, *and* the surface area, in square centimeters, of the rectangular prism shown below.



- 584 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  $x$ .
- 585 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.

## Integrated Algebra Regents Exam Questions by Performance Indicator: Topic Answer Section

1 ANS: 3

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

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

2 ANS: 1

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

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: 3

PTS: 2

REF: fall0705ia

STA: A.N.1

TOP: Identifying Properties

7 ANS: 2

PTS: 2

REF: 080802ia

STA: A.N.1

TOP: Identifying Properties

8 ANS:

(1) Distributive; (2) Commutative

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

9 ANS: 3

PTS: 2

REF: 060926ia

STA: A.N.1

TOP: Properties of Reals

10 ANS: 4

PTS: 2

REF: 011114ia

STA: A.N.1

TOP: Properties of Reals

11 ANS: 3

PTS: 2

REF: 011224ia

STA: A.N.1

TOP: Properties of Reals

12 ANS: 1

PTS: 2

REF: 081209ia

STA: A.N.1

TOP: Properties of Reals

13 ANS:

 $-6a + 42$ . distributive

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

14 ANS: 4

PTS: 2

REF: fall0704ia

STA: A.A.29

TOP: Set Theory

- 15 ANS: 1                   PTS: 2                   REF: 061021ia           STA: A.A.29  
TOP: Set Theory
- 16 ANS: 2                   PTS: 2                   REF: 011119ia           STA: A.A.29  
TOP: Set Theory
- 17 ANS: 3                   PTS: 2                   REF: 081117ia           STA: A.A.29  
TOP: Set Theory
- 18 ANS: 3                   PTS: 2                   REF: 061217ia           STA: A.A.29  
TOP: Set Theory
- 19 ANS: 3                   PTS: 2                   REF: 010917ia           STA: A.A.29  
TOP: Set Theory
- 20 ANS: 4                   PTS: 2                   REF: 060930ia           STA: A.A.29  
TOP: Set Theory
- 21 ANS: 4                   PTS: 2                   REF: 081022ia           STA: A.A.29  
TOP: Set Theory
- 22 ANS: 2                   PTS: 2                   REF: 061128ia           STA: A.A.29  
TOP: Set Theory
- 23 ANS: 4                   PTS: 2                   REF: 011222ia           STA: A.A.29  
TOP: Set Theory
- 24 ANS: 4                   PTS: 2                   REF: 061001ia           STA: A.A.30  
TOP: Set Theory
- 25 ANS: 3                   PTS: 2                   REF: 081009ia           STA: A.A.30  
TOP: Set Theory
- 26 ANS: 4  
 $A = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$
- PTS: 2                   REF: 080912ia           STA: A.A.30           TOP: Set Theory
- 27 ANS: 3                   PTS: 2                   REF: 081103ia           STA: A.A.30  
TOP: Set Theory
- 28 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
- 29 ANS:  
 $\{1, 2, 4, 5, 9, 10, 12\}$
- PTS: 2                   REF: 080833ia           STA: A.A.30           TOP: Set Theory
- 30 ANS: 3                   PTS: 2                   REF: fall0710ia           STA: A.A.31  
TOP: Set Theory
- 31 ANS: 1                   PTS: 2                   REF: 011004ia           STA: A.A.31  
TOP: Set Theory
- 32 ANS: 1                   PTS: 2                   REF: 011101ia           STA: A.A.31  
TOP: Set Theory
- 33 ANS: 3                   PTS: 2                   REF: 061208ia           STA: A.A.31  
TOP: Set Theory
- 34 ANS: 2                   PTS: 2                   REF: 081003ia           STA: A.A.31  
TOP: Set Theory

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

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

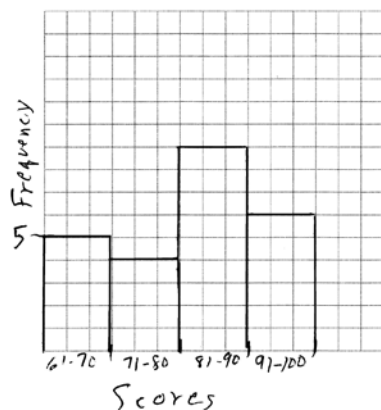
37 ANS: 3  
 $A \cup C = \{1, 2, 3, 5, 7, 9\}$

PTS: 2                      REF: 081221ia                      STA: A.A.31                      TOP: Set Theory

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

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

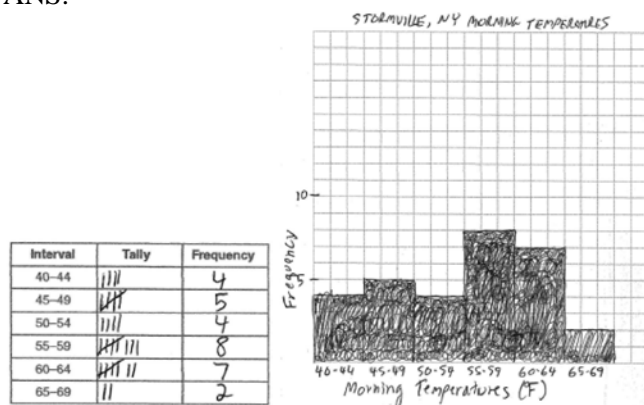
39 ANS:



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

KEY: frequency histograms

40 ANS:

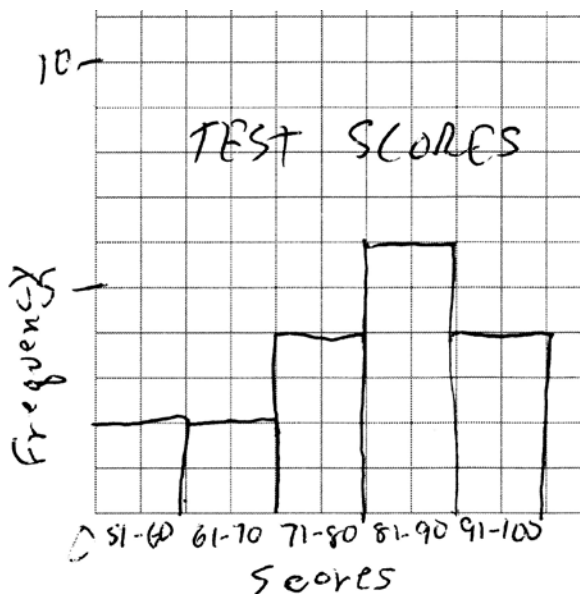


PTS: 4                      REF: 060938ia                      STA: A.S.5  
 TOP: Frequency Histograms, Bar Graphs and Tables

KEY: frequency histograms

41 ANS:

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

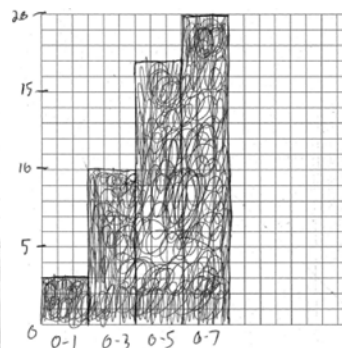


PTS: 3 REF: 011135ia STA: A.S.5  
 TOP: Frequency Histograms, Bar Graphs and Tables

KEY: frequency histograms

42 ANS:

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



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

KEY: cumulative frequency histograms

43 ANS: 3  
 $25 - 18 = 7$

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

44 ANS: 3 PTS: 2 REF: 061230ia STA: A.S.9  
 TOP: Frequency Histograms, Bar Graphs and Tables

45 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

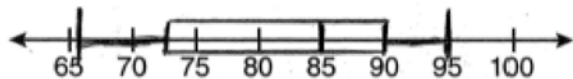
46 ANS:  
3, 0, 20.  $15 - 12 = 3$ .  $12 - 12 = 0$

PTS: 3 REF: 081234ia STA: A.S.9  
TOP: Frequency Histograms, Bar Graphs and Tables

47 ANS: 2  
The median score, 10, is the vertical line in the center of the box.

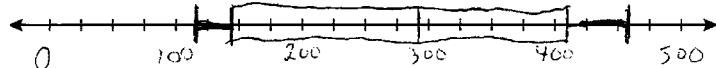
PTS: 2 REF: fall0709ia STA: A.S.5 TOP: Box-and-Whisker Plots

48 ANS:



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

49 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

50 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

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

52 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

53 ANS: 1 PTS: 2 REF: 011001ia STA: A.S.6  
TOP: Box-and-Whisker Plots

54 ANS: 3  
 $75 - 15 = 60$

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

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

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

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

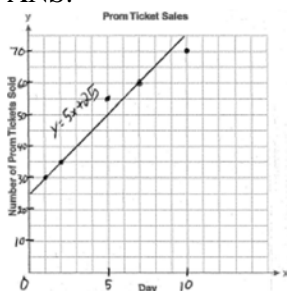
58 ANS: 4  
 $\frac{95000}{125000} = .76$

PTS: 2 REF: 061207ia STA: A.S.11 TOP: Quartiles and Percentiles

- 59 ANS: 2                   PTS: 2                   REF: fall0701ia           STA: A.S.7  
 TOP: Scatter Plots
- 60 ANS: 3                   PTS: 2                   REF: 081001ia           STA: A.S.7  
 TOP: Scatter Plots
- 61 ANS: 2                   PTS: 2                   REF: 061115ia           STA: A.S.7  
 TOP: Scatter Plots
- 62 ANS: 4

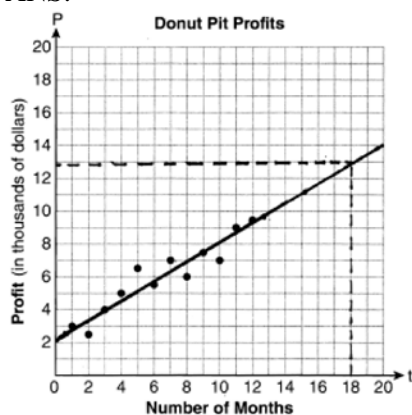


- PTS: 2                   REF: 080822ia           STA: A.S.8           TOP: Scatter Plots
- 63 ANS: 4                   PTS: 2                   REF: 011229ia           STA: A.S.8  
 TOP: Scatter Plots
- 64 ANS:



- PTS: 3                   REF: 060936ia           STA: A.S.8           TOP: Scatter Plots
- 65 ANS: 4                   PTS: 2                   REF: 060805ia           STA: A.S.12  
 TOP: Scatter Plots
- 66 ANS: 2                   PTS: 2                   REF: 011019ia           STA: A.S.12  
 TOP: Scatter Plots
- 67 ANS: 3                   PTS: 2                   REF: 011103ia           STA: A.S.12  
 TOP: Scatter Plots
- 68 ANS: 1                   PTS: 2                   REF: 081102ia           STA: A.S.12  
 TOP: Scatter Plots
- 69 ANS: 2                   PTS: 2                   REF: 061205ia           STA: A.S.12  
 TOP: Scatter Plots
- 70 ANS: 1                   PTS: 2                   REF: 081204ia           STA: A.S.12  
 TOP: Scatter Plots
- 71 ANS: 2                   PTS: 2                   REF: 080930ia           STA: A.S.17  
 TOP: Scatter Plots
- 72 ANS: 3                   PTS: 2                   REF: 081208ia           STA: A.S.17  
 TOP: Scatter Plots

73 ANS:



They will not reach their goal in 18 months.

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

74 ANS: 3

mean = 6, median = 6 and mode = 7

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

75 ANS: 3

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

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

76 ANS: 4

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

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

77 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

78 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

79 ANS:

81.3, 80, both increase

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

80 ANS:

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

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



81 ANS: 4

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

$$x = 25$$

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

82 ANS: 3

The other situations are quantitative.

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

83 ANS: 3

The other situations are quantitative.

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

84 ANS: 4

The other sets of data are qualitative.

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

85 ANS: 4

The other situations are quantitative.

PTS: 2 REF: 081122ia STA: A.S.1 TOP: Analysis of Data

86 ANS: 2

The other sets of data are qualitative.

PTS: 2 REF: 011211ia STA: A.S.1 TOP: Analysis of Data

87 ANS: 3

The other situations are qualitative.

PTS: 2 REF: 081213ia STA: A.S.1 TOP: Analysis of Data

88 ANS: 2

The two values are shoe size and height.

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

89 ANS: 3

TOP: Analysis of Data

PTS: 2 REF: 061206ia STA: A.S.2

90 ANS: 3

Frequency is not a variable.

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

91 ANS: 3

TOP: Analysis of Data

PTS: 2 REF: 061011ia STA: A.S.2

92 ANS: 1

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

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

93 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

94 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

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

96 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

97 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

98 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

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

PTS: 2 REF: fall0707ia STA: A.S.13 TOP: Analysis of Data

100 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

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

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

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

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

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

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

106 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

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

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

KEY: volume and surface area

107 ANS: 2

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

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

KEY: area

108 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

109 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

110 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

111 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

112 ANS:

$$\frac{8100 - 7678.5}{7678.5} \approx 0.055$$

PTS: 2 REF: 061233ia STA: A.M.3 TOP: Error

KEY: area

113 ANS:

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

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

114 ANS:

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

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

115 ANS:

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

PTS: 3 REF: 011036ia STA: A.M.3 TOP: Error  
KEY: volume and surface area

116 ANS:

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

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

117 ANS:

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

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

118 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

119 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

120 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

121 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

122 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

123 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

124 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

125 ANS: 2

PTS: 2

REF: 060908ia

STA: A.S.21

TOP: Empirical Probability

126 ANS: 3

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

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

127 ANS: 3

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

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

128 ANS:

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

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

129 ANS: 2

PTS: 2

REF: 011002ia

STA: A.S.20

TOP: Theoretical Probability

130 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

131 ANS: 3

$$P(O) = \frac{5}{10}, P(P) = \frac{4}{10}, P(\leq 5) = \frac{6}{10}, P(/3) = \frac{4}{10}$$

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

132 ANS:

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

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

133 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

134 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

135 ANS: 3

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

136 ANS: 2

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

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

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

KEY: not mutually exclusive events

137 ANS: 3

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

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

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

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

KEY: independent events

138 ANS: 2

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

139 ANS: 4

PTS: 2 REF: 081229ia STA: A.S.23  
TOP: Theoretical Probability KEY: independent events

140 ANS:

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

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

141 ANS: 3                      PTS: 2                      REF: 080907ia                      STA: A.S.20

TOP: Geometric Probability

142 ANS: 3                      PTS: 2                      REF: 061218ia                      STA: A.S.20

TOP: Geometric Probability

143 ANS:

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

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

144 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

145 ANS: 3

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

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

146 ANS: 1

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

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

147 ANS:

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

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

148 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

149 ANS: 3

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

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

150 ANS: 4

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

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

- 151 ANS: 3                      PTS: 2                      REF: 060808ia                      STA: A.N.8  
TOP: Permutations
- 152 ANS: 1  
 ${}_4P_4 = 4 \times 3 \times 2 \times 1 = 24$
- PTS: 2                      REF: 080816ia                      STA: A.N.8                      TOP: Permutations
- 153 ANS: 4  
 ${}_8P_3 = 336$
- PTS: 2                      REF: 061026ia                      STA: A.N.8                      TOP: Permutations
- 154 ANS: 3  
 ${}_6P_4 = 360$
- PTS: 2                      REF: 081028ia                      STA: A.N.8                      TOP: Permutations
- 155 ANS: 4  
 ${}_5P_5 = 5 \times 4 \times 3 \times 2 \times 1 = 120$
- PTS: 2                      REF: 061109ia                      STA: A.N.8                      TOP: Permutations
- 156 ANS:  
60.  ${}_5P_3 = 60$
- PTS: 2                      REF: 060931ia                      STA: A.N.8                      TOP: Permutations
- 157 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
- 158 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
- 159 ANS: 4  
 $25(x - 3) = 25x - 75$
- PTS: 2                      REF: 060823ia                      STA: A.A.1                      TOP: Expressions
- 160 ANS: 4  
 $A = lw = (3w - 7)(w) = 3w^2 - 7w$
- PTS: 2                      REF: 010924ia                      STA: A.A.1                      TOP: Expressions
- 161 ANS: 2                      PTS: 2                      REF: 060904ia                      STA: A.A.1  
TOP: Expressions
- 162 ANS: 4  
 $5(x + 4) = 5x + 20$
- PTS: 2                      REF: 081013ia                      STA: A.A.1                      TOP: Expressions



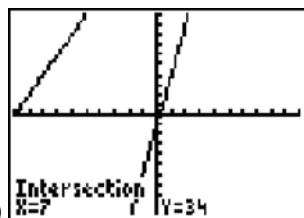
- 163 ANS: 3            PTS: 2            REF: 011104ia        STA: A.A.1  
TOP: Expressions
- 164 ANS: 1            PTS: 2            REF: 081110ia        STA: A.A.1  
TOP: Expressions
- 165 ANS: 3            PTS: 2            REF: 011205ia        STA: A.A.1  
TOP: Expressions
- 166 ANS: 1            PTS: 2            REF: 061204ia        STA: A.A.1  
TOP: Expressions
- 167 ANS: 2            PTS: 2            REF: 081215ia        STA: A.A.1  
TOP: Expressions
- 168 ANS: 4            PTS: 2            REF: fall0729ia      STA: A.A.2  
TOP: Expressions
- 169 ANS: 4            PTS: 2            REF: 061016ia        STA: A.A.2  
TOP: Expressions
- 170 ANS: 3            PTS: 2            REF: 061119ia        STA: A.A.2  
TOP: Expressions
- 171 ANS: 2            PTS: 2            REF: 011027ia        STA: A.A.3  
TOP: Expressions
- 172 ANS: 1            PTS: 2            REF: 081030ia        STA: A.A.3  
TOP: Expressions
- 173 ANS: 2            PTS: 2            REF: 061121ia        STA: A.A.3  
TOP: Expressions
- 174 ANS: 2            PTS: 2            REF: 011227ia        STA: A.A.3  
TOP: Expressions

175 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

176 ANS: 4



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

$$3p = 21$$

$$p = 7$$

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

177 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

178 ANS: 2

Debbie failed to distribute the 3 properly.

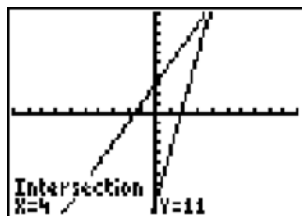
PTS: 2

REF: 011009ia

STA: A.A.22

TOP: Solving Equations

179 ANS:



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

$$12 = 3g$$

$$g = 4$$

PTS: 2

REF: fall0732ia

STA: A.A.22

TOP: Solving Equations

180 ANS:

4.  $3(x + 1) - 5x = 12 - (6x - 7)$

$$3x + 3 - 5x = 12 - 6x + 7$$

$$-2x + 3 = -6x + 19$$

$$4x = 16$$

$$x = 4$$

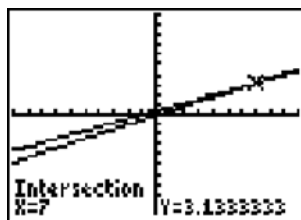
PTS: 4

REF: 061238ia

STA: A.A.22

TOP: Solving Equations

181 ANS: 4



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

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

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

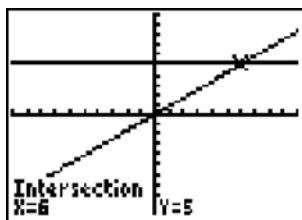
$$6x+5 = 7x-2$$

$$x = 7$$

PTS: 2 REF: 080820ia STA: A.A.25

TOP: Solving Equations with Fractional Expressions

182 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

183 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

184 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

185 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

186 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

187 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

188 ANS: 2

PTS: 2

REF: 080901ia

STA: A.A.4

TOP: Modeling Equations

189 ANS: 4

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

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

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

190 ANS: 2 PTS: 2 REF: 010915ia STA: A.A.5  
TOP: Modeling Equations191 ANS: 4 PTS: 2 REF: 081011ia STA: A.A.5  
TOP: Modeling Equations192 ANS: 3 PTS: 2 REF: 061225ia STA: A.A.5  
TOP: Modeling Equations

193 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

194 ANS:

$$7, 9, 11. \quad x + (x + 2) + (x + 4) = 5(x + 2) - 18$$

$$3x + 6 = 5x - 8$$

$$14 = 2x$$

$$7 = x$$

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

195 ANS: 3

$$3ax + b = c$$

$$3ax = c - b$$

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

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

196 ANS: 2

$$P = 2l + 2w$$

$$P - 2l = 2w$$

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

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

197 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

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

TOP: Transforming Formulas

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

TOP: Transforming Formulas

200 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

201 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

202 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

203 ANS: 3 PTS: 2 REF: 081230ia STA: A.A.23

TOP: Transforming Formulas

204 ANS:

$$bc + ac = ab$$

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

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

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

205 ANS: 3

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

$$x = 5400$$

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

206 ANS: 3

$$\frac{120}{60} = \frac{m}{150}$$

$$m = 300$$

PTS: 2 REF: 081202ia STA: A.M.1 TOP: Using Rate

207 ANS:

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

$$25x = 54,000$$

$$x = 2,160$$

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

208 ANS:

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

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

209 ANS: 4

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

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

210 ANS: 4

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

$$5x = 360$$

$$x = 72$$

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

211 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

212 ANS: 1

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

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

213 ANS: 1

$$\frac{\text{distance}}{\text{time}} = \frac{350.7}{4.2} = 83.5$$

PTS: 2 REF: 061201ia STA: A.M.1 TOP: Speed

214 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

215 ANS:

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

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

216 ANS:

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

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

217 ANS:

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

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

218 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

219 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



220 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

221 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

222 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

223 ANS:

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

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

224 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

225 ANS: 2

Candidate *B* received 45%.  $45\% \times 1860 = 837$

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

226 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

227 ANS:

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

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

228 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

229 ANS: 4

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

$$20x = 4500$$

$$x = 225$$

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

230 ANS:

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

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

231 ANS: 2

PTS: 2

REF: 080823ia

STA: A.A.32

TOP: Slope

232 ANS: 2

PTS: 2

REF: 081223ia

STA: A.A.32

TOP: Slope

233 ANS: 1

PTS: 2

REF: 081115ia

STA: A.A.32

TOP: Slope

234 ANS: 3

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

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

235 ANS: 3

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

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

236 ANS: 2

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

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

237 ANS: 1

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

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

238 ANS: 2

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

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

239 ANS: 3

$$m = \frac{6-4}{3-(-2)} = \frac{2}{5}$$

PTS: 2 REF: 061110ia STA: A.A.33 TOP: Slope

240 ANS: 4

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

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

241 ANS: 4

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

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

242 ANS: 2

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

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

243 ANS: 2

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

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

244 ANS: 4

$$m = \frac{-A}{B} = \frac{-(-3)}{2} = \frac{3}{2}$$

PTS: 2 REF: 061212ia STA: A.A.37 TOP: Slope

## Integrated Algebra Regents Exam Questions by Performance Indicator: Topic Answer Section

245 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

246 ANS: 1

$$y = mx + b$$

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

$$b = 6$$

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

247 ANS: 4

$$y = mx + b$$

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

$$b = -7$$

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

248 ANS: 1

$$y = mx + b$$

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

$$b = 7$$

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

249 ANS: 3

$$y = mx + b \quad y = \frac{3}{4}x - \frac{1}{2}$$

$$1 = \left(\frac{3}{4}\right)(2) + b \quad 4y = 3x - 2$$

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

$$b = -\frac{1}{2}$$

PTS: 2 REF: 081219ia STA: A.A.34 TOP: Writing Linear Equations

250 ANS:

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

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

$$4 = -6 + b$$

$$10 = b$$

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

251 ANS: 1

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

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

252 ANS: 3 PTS: 2 REF: 010910ia STA: A.A.35

TOP: Writing Linear Equations

253 ANS: 3

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

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

$$3 = -2 + b$$

$$5 = b$$

PTS: 2 REF: 011013ia STA: A.A.35 TOP: Writing Linear Equations

254 ANS: 2

$$m = \frac{5-3}{8-1} = \frac{2}{7} \quad y - y_1 = m(x - x_1)$$

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

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

255 ANS:

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

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

$$b = 2$$

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

256 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

- 257 ANS: 3  
 $2(1)+3=5$
- PTS: 2 REF: 061007ia STA: A.A.39 TOP: Linear Equations
- 258 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
- 259 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
- 260 ANS: 4  
 $2(2) - (-7) = 11$
- PTS: 2 REF: 081217ia STA: A.A.39 TOP: Identifying Points on a Line
- 261 ANS: 2 PTS: 2 REF: 080810ia STA: A.A.36  
TOP: Parallel and Perpendicular Lines
- 262 ANS: 1 PTS: 2 REF: 080911ia STA: A.A.36  
TOP: Parallel and Perpendicular Lines
- 263 ANS: 2 PTS: 2 REF: 081014ia STA: A.A.36  
TOP: Parallel and Perpendicular Lines
- 264 ANS: 4 PTS: 2 REF: 061112ia STA: A.A.36  
TOP: Parallel and Perpendicular Lines
- 265 ANS: 1  
The slope of both is  $-4$ .
- PTS: 2 REF: 060814ia STA: A.A.38 TOP: Parallel and Perpendicular Lines
- 266 ANS: 1  
The slope of  $y = 3 - 2x$  is  $-2$ . Using  $m = -\frac{A}{B}$ , the slope of  $4x + 2y = 5$  is  $-\frac{4}{2} = -2$ .
- PTS: 2 REF: 010926ia STA: A.A.38 TOP: Parallel and Perpendicular Lines
- 267 ANS: 1  
The slope of  $2x - 4y = 16$  is  $\frac{-A}{B} = \frac{-2}{-4} = \frac{1}{2}$
- PTS: 2 REF: 011026ia STA: A.A.38 TOP: Parallel and Perpendicular Lines
- 268 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

269 ANS: 1

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

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

$$2m \leq 10$$

$$m \leq 5$$

PTS: 2

REF: 081002ia

STA: A.A.24

TOP: Solving Inequalities

270 ANS: 4

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

$$-42 \geq 14x$$

$$-3 \geq x$$

PTS: 2

REF: 081121ia

STA: A.A.24

TOP: Solving Inequalities

271 ANS:

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

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

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

$$7x \geq 21$$

$$x \geq 3$$

PTS: 3

REF: 011234ia

STA: A.A.24

TOP: Solving Inequalities

272 ANS: 1

$$-2x + 5 > 17$$

$$-2x > 12$$

$$x < -6$$

PTS: 2

REF: fall0724ia

STA: A.A.21

TOP: Interpreting Solutions

273 ANS: 4

$$-4x + 2 > 10$$

$$-4x > 8$$

$$x < -2$$

PTS: 2

REF: 080805ia

STA: A.A.21

TOP: Interpreting Solutions

274 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

275 ANS: 4

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

$$-2x + 10 < 4$$

$$-2x < -6$$

$$x > 3$$

PTS: 2

REF: 080913ia

STA: A.A.21

TOP: Interpreting Solutions

276 ANS:

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

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

$$7x < -30$$

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

PTS: 3

REF: 061034ia

STA: A.A.21

TOP: Interpreting Solutions

277 ANS: 1

PTS: 2

REF: 080803ia

STA: A.A.4

TOP: Modeling Inequalities

278 ANS: 4

PTS: 2

REF: 060906ia

STA: A.A.4

TOP: Modeling Inequalities

279 ANS: 4

PTS: 2

REF: fall0715ia

STA: A.A.5

TOP: Modeling Inequalities

280 ANS: 2

PTS: 2

REF: 060821ia

STA: A.A.5

TOP: Modeling Inequalities

281 ANS: 2

PTS: 2

REF: 011005ia

STA: A.A.5

TOP: Modeling Inequalities

282 ANS: 4

PTS: 2

REF: 081107ia

STA: A.A.5

TOP: Modeling Inequalities

283 ANS: 2

PTS: 2

REF: 081212ia

STA: A.A.5

TOP: Modeling Inequalities



- 284 ANS: 1  
 $0.07m + 19 \leq 29.50$   
 $0.07m \leq 10.50$   
 $m \leq 150$
- PTS: 2 REF: 010904ia STA: A.A.6 TOP: Modeling Inequalities
- 285 ANS: 1  
 $13.95 + 0.49s \leq 50.00$   
 $0.49s \leq 36.05$   
 $s \leq 73.57$
- PTS: 2 REF: 080904ia STA: A.A.6 TOP: Modeling Inequalities
- 286 ANS: 3  
 $5x < 55$   
 $x < 11$
- PTS: 2 REF: 061211ia STA: A.A.6 TOP: Modeling Inequalities
- 287 ANS: 4  
 $375 + 155w \geq 900$   
 $155w \geq 525$   
 $w \geq 3.4$
- PTS: 2 REF: 081206ia STA: A.A.6 TOP: Modeling Inequalities
- 288 ANS:  
7.  $15x + 22 \geq 120$   
 $x \geq 6.5\bar{3}$
- PTS: 3 REF: fall0735ia STA: A.A.6 TOP: Modeling Inequalities
- 289 ANS:  
 $10 + 2d \geq 75, 33. 10 + 2d \geq 75$   
 $d \geq 32.5$
- PTS: 3 REF: 060834ia STA: A.A.6 TOP: Modeling Inequalities
- 290 ANS:  
 $0.65x + 35 \leq 45$   
 $0.65x \leq 10$   
 $x \leq 15$
- PTS: 3 REF: 061135ia STA: A.A.6 TOP: Modeling Inequalities
- 291 ANS: 4 PTS: 2 REF: 061028ia STA: A.G.6  
TOP: Linear Inequalities

292 ANS: 2

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

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

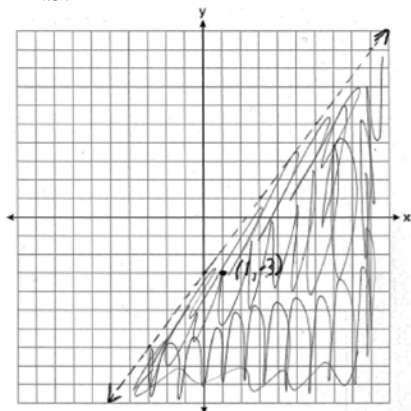
293 ANS: 1 PTS: 2 REF: 060920ia STA: A.G.6

TOP: Linear Inequalities

294 ANS: 1 PTS: 2 REF: 011210ia STA: A.G.6

TOP: Linear Inequalities

295 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

296 ANS: 3 PTS: 2 REF: 011117ia STA: A.G.4

TOP: Graphing Absolute Value Functions

297 ANS: 4

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

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

298 ANS: 4

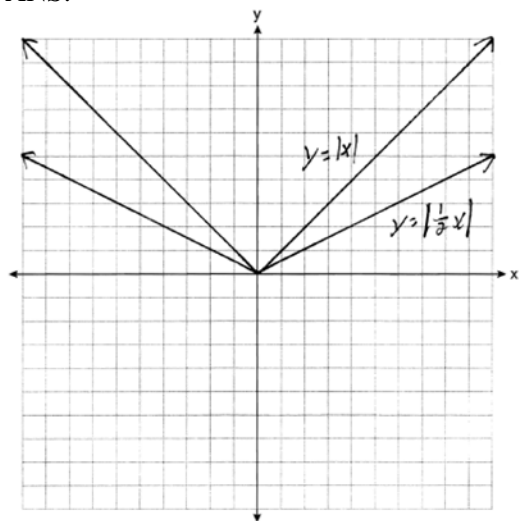
The transformation is a reflection in the  $x$ -axis.

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

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

TOP: Graphing Absolute Value Functions

300 ANS:



. Graph becomes wider as the coefficient approaches 0.

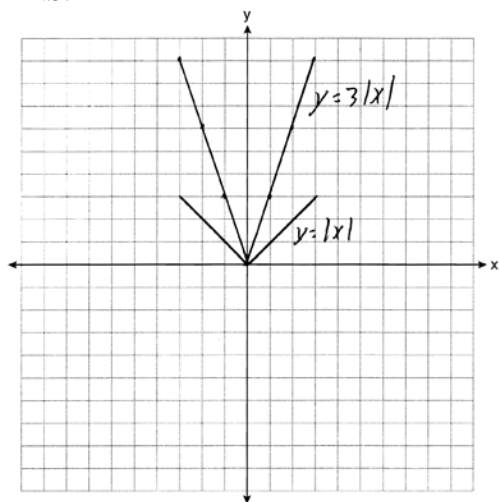
PTS: 3

REF: 061035ia

STA: A.G.5

TOP: Graphing Absolute Value Functions

301 ANS:



The graph becomes steeper.

PTS: 3

REF: 081134ia

STA: A.G.5

TOP: Graphing Absolute Value Functions

302 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

303 ANS: 2

PTS: 2

REF: 061027ia

STA: A.A.20

TOP: Factoring Polynomials

304 ANS: 2

PTS: 2

REF: 061105ia

STA: A.A.20

TOP: Factoring Polynomials

305 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

- 306 ANS: 3                   PTS: 2                   REF: fall0706ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 307 ANS: 1                   PTS: 2                   REF: 060804ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 308 ANS: 2                   PTS: 2                   REF: 010909ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 309 ANS: 1                   PTS: 2                   REF: 080902ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 310 ANS: 2                   PTS: 2                   REF: 011022ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 311 ANS: 3                   PTS: 2                   REF: 081008ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 312 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
- 313 ANS: 3                   PTS: 2                   REF: 061101ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 314 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
- 315 ANS: 2                   PTS: 2                   REF: 011201ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 316 ANS: 3                   PTS: 2                   REF: 081207ia           STA: A.A.19  
TOP: Factoring the Difference of Perfect Squares
- 317 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
- 318 ANS: 3  
 $x^2 - 6x = 0$   
 $x(x - 6) = 0$   
 $x = 0 \quad x = 6$
- PTS: 2                   REF: 080921ia           STA: A.A.27           TOP: Solving Quadratics by Factoring
- 319 ANS: 3  
 $x^2 - 10x + 21 = 0$   
 $(x - 7)(x - 3) = 0$   
 $x = 7 \quad x = 3$
- PTS: 2                   REF: 010914ia           STA: A.A.28           TOP: Roots of Quadratics

- 320 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
- 321 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
- 322 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
- 323 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
- 324 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
- 325 ANS:  
-15, 2                       $x^2 + 13x - 30 = 0$   
 $(x + 15)(x - 2) = 0$   
 $x = -15, 2$
- PTS: 3                      REF: 081036ia                      STA: A.A.28                      TOP: Roots of Quadratics
- 326 ANS: 4                      PTS: 2                      REF: 060829ia                      STA: A.G.5  
TOP: Graphing Quadratic Functions
- 327 ANS: 2                      PTS: 2                      REF: 061113ia                      STA: A.G.5  
TOP: Graphing Quadratic Functions

328 ANS: 2 PTS: 2 REF: 081218ia STA: A.G.5  
TOP: Graphing Quadratic Functions

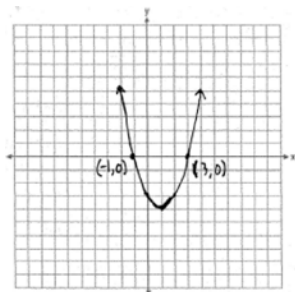
329 ANS: 1 PTS: 2 REF: 081015ia STA: A.G.5  
TOP: Graphing Quadratic Functions

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

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

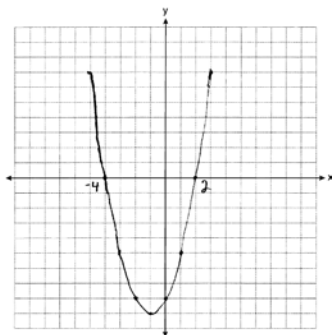
332 ANS: 4 PTS: 2 REF: 011111ia STA: A.G.8  
TOP: Solving Quadratics by Graphing

333 ANS:



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

334 ANS:



PTS: 3 REF: 061234ia STA: A.G.8 TOP: Solving Quadratics by Graphing

335 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

336 ANS: 3

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

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

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

$$d = 5$$

PTS: 2

REF: 011208ia

STA: A.A.8

TOP: Writing Quadratics

337 ANS:

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

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

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

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

$$x = 6$$

PTS: 4

REF: 011039ia

STA: A.A.8

TOP: Writing Quadratics

338 ANS: 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

339 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

340 ANS:

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

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

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

$$w = 3$$

PTS: 4

REF: 060837ia

STA: A.A.8

TOP: Geometric Applications of Quadratics

341 ANS: 1

PTS: 2

REF: 060811ia

STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

342 ANS: 1

PTS: 2

REF: 080813ia

STA: A.G.10

TOP: Identifying the Vertex of a Quadratic Given Graph

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

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

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

346 ANS: 2 PTS: 2 REF: 081111ia STA: A.G.10  
TOP: Identifying the Vertex of a Quadratic Given Graph

347 ANS: 4 PTS: 2 REF: 081214ia STA: A.G.10  
TOP: Identifying the Vertex of a Quadratic Given Graph

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

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

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

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

350 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

351 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

352 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

353 ANS: 3  
 $x = \frac{-b}{2a} = \frac{-24}{2(-2)} = 6. y = -2(6)^2 + 24(6) - 100 = -28$

PTS: 2 REF: 061214ia STA: A.A.41  
TOP: Identifying the Vertex of a Quadratic Given Equation



354 ANS:

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

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

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

355 ANS: 3

$$5x + 2y = 48$$

$$3x + 2y = 32$$

$$2x = 16$$

$$x = 8$$

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

356 ANS: 2

$$x + 2y = 9$$

$$x - y = 3$$

$$3y = 6$$

$$y = 2$$

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

357 ANS: 1

$$x - 2y = 1$$

$$x + 4y = 7$$

$$-6y = -6$$

$$y = 1$$

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

358 ANS: 3

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

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

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

$$d = 2$$

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

359 ANS: 2

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

$$2x + y = 8$$

$$2x - 6y = -6$$

$$7y = 14$$

$$y = 2$$

PTS: 2

REF: 081021ia

STA: A.A.10

TOP: Solving Linear Systems

360 ANS: 3

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

$$-2x + 3y = -9$$

$$2x = 6$$

$$-2y = 2$$

$$x = 3$$

$$y = -1$$

PTS: 2

REF: 081109ia

STA: A.A.10

TOP: Solving Linear Systems

361 ANS:

2. Subtracting the equations:  $3y = 6$ 

$$y = 2$$

PTS: 2

REF: 061231ia

STA: A.A.10

TOP: Solving Linear Systems

362 ANS:

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

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

$$y = 5$$

$$3x = -6$$

$$x = -2$$

PTS: 4

REF: 010937ia

STA: A.A.10

TOP: Solving Linear Systems

363 ANS: 3

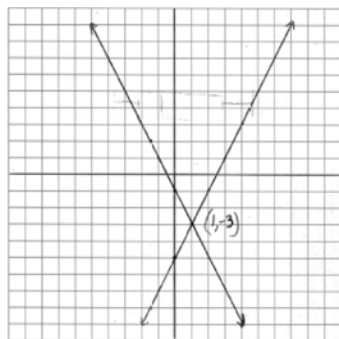
PTS: 2

REF: 081201ia

STA: A.G.7

TOP: Solving Linear Systems

364 ANS:



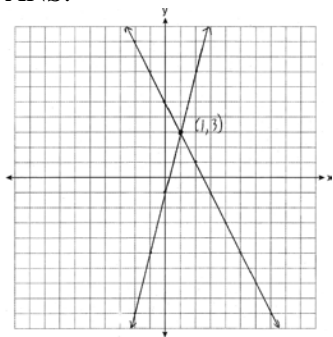
PTS: 4

REF: 080938ia

STA: A.G.7

TOP: Solving Linear Systems

365 ANS:



PTS: 3

REF: 011235ia

STA: A.G.7

TOP: Solving Linear Systems

366 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

367 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

368 ANS: 2

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

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

PTS: 2

REF: 080811ia

STA: A.A.7

TOP: Writing Linear Systems

369 ANS: 2

$$L + S = 47$$

$$L - S = 15$$

$$2L = 62$$

$$L = 31$$

PTS: 2

REF: 060912ia

STA: A.A.7

TOP: Writing Linear Systems

370 ANS: 1

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

$$7f + 10 = 1424$$

$$f = 202$$

PTS: 2

REF: 060917ia

STA: A.A.7

TOP: Writing Linear Systems

371 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

372 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

373 ANS: 1

$$f + m = 53$$

$$f - m = 25$$

$$2m = 28$$

$$m = 14$$

PTS: 2

REF: 061126ia

STA: A.A.7

TOP: Writing Linear Systems

374 ANS: 1

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

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

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

PTS: 2

REF: 081119ia

STA: A.A.7

TOP: Writing Linear Systems

375 ANS: 2

$$W + L = 72$$

$$W - L = 12$$

$$2W = 84$$

$$W = 42$$

PTS: 2

REF: 081227ia

STA: A.A.7

TOP: Writing Linear Systems

376 ANS:

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

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

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

$$m = \$0.50$$

PTS: 4      REF: 080837ia      STA: A.A.7      TOP: Writing Linear Systems

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

TOP: Systems of Linear Inequalities

378 ANS: 2      PTS: 2      REF: 081127ia      STA: A.A.40

TOP: Systems of Linear Inequalities

379 ANS: 4      PTS: 2      REF: 061222ia      STA: A.A.40

TOP: Systems of Linear Inequalities

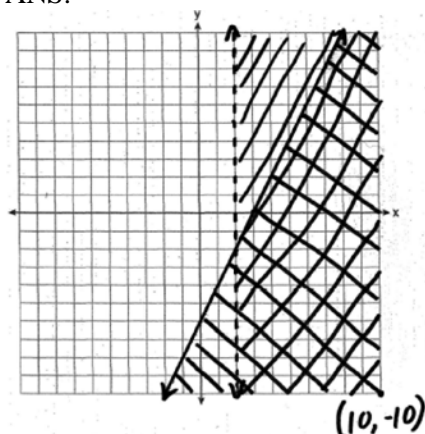
380 ANS: 4      PTS: 2      REF: 080825ia      STA: A.A.40

TOP: Systems of Linear Inequalities

381 ANS: 2      PTS: 2      REF: 011023ia      STA: A.A.40

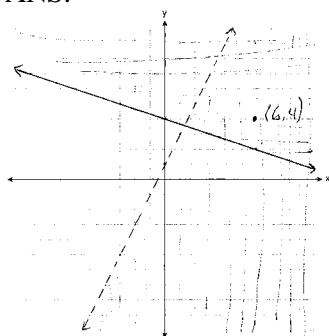
TOP: Systems of Linear Inequalities

382 ANS:



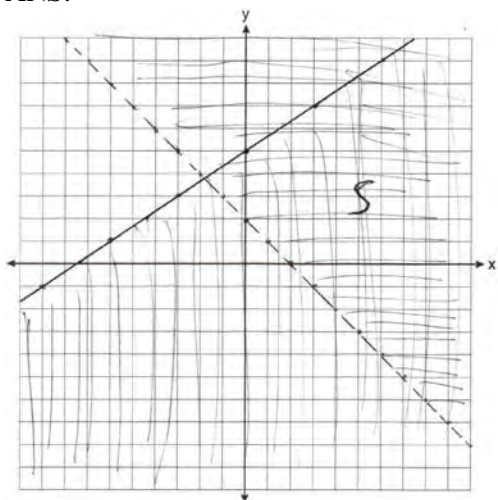
PTS: 4      REF: 010938ia      STA: A.G.7      TOP: Systems of Linear Inequalities

383 ANS:



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

384 ANS:



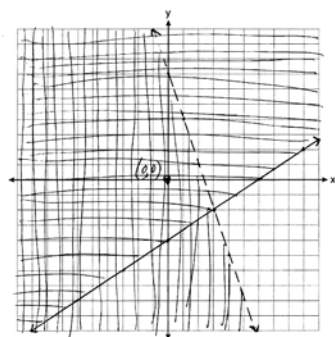
PTS: 4

REF: 011139ia

STA: A.G.7

TOP: Systems of Linear Inequalities

385 ANS:



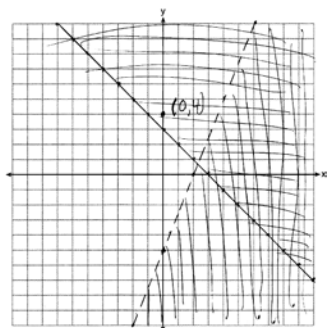
PTS: 4

REF: 061139ia

STA: A.G.7

TOP: Systems of Linear Inequalities

386 ANS:



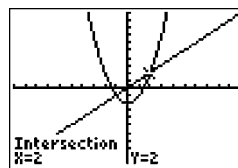
PTS: 4

REF: 081239ia

STA: A.G.7

TOP: Systems of Linear Inequalities

387 ANS: 4



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

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

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

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

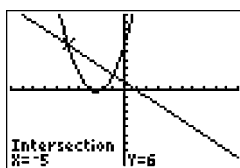
PTS: 2

REF: 060810ia

STA: A.A.11

TOP: Quadratic-Linear Systems

388 ANS: 2



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

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

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

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

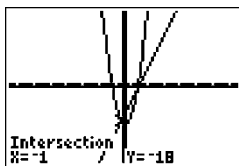
PTS: 2

REF: 080812ia

STA: A.A.11

TOP: Quadratic-Linear Systems

389 ANS: 2



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

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

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

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

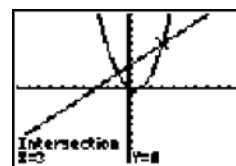
PTS: 2

REF: 010922ia

STA: A.A.11

TOP: Quadratic-Linear Systems

390 ANS: 2



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

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

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

$$x = 3 \text{ or } -1$$

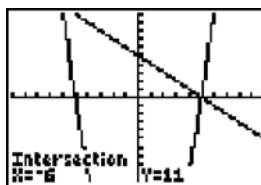
PTS: 2

REF: 061118ia

STA: A.A.11

TOP: Quadratic-Linear Systems

391 ANS: 2



$$y = -x + 5. \quad -x + 5 = x^2 - 25 \quad . \quad y = -(-6) + 5 = 11.$$

$$0 = x^2 + x - 30 \quad y = -5 + 5 = 0$$

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

$$x = -6, 5$$

PTS: 2                      REF: 061213ia                      STA: A.A.11                      TOP: Quadratic-Linear Systems

392 ANS:

$$(-3, -5), (3, 7). \quad x^2 + 2x - 8 = 2x + 1. \quad y = 2(3) + 1 = 7$$

$$x^2 - 9 = 0 \quad y = 2(-3) + 1 = -5$$

$$x = \pm 3$$

PTS: 3                      REF: 081236ia                      STA: A.A.11                      TOP: Quadratic-Linear Systems

393 ANS: 1                      PTS: 2                      REF: 011207ia                      STA: A.G.9  
TOP: Quadratic-Linear Systems

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

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

396 ANS: 1

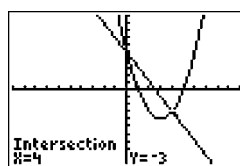
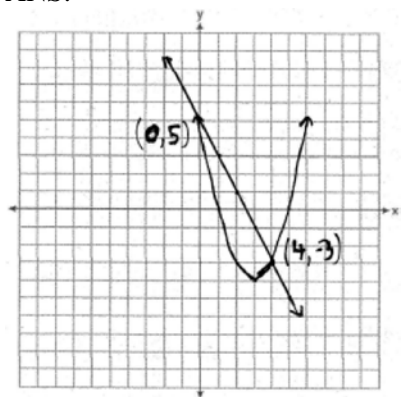
$$2y - 2x = 10 \quad \text{axis of symmetry: } x = \frac{-b}{2a} = \frac{-2}{2(1)} = -1$$

$$2y = 2x + 10$$

$$y = x + 5$$

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

397 ANS:

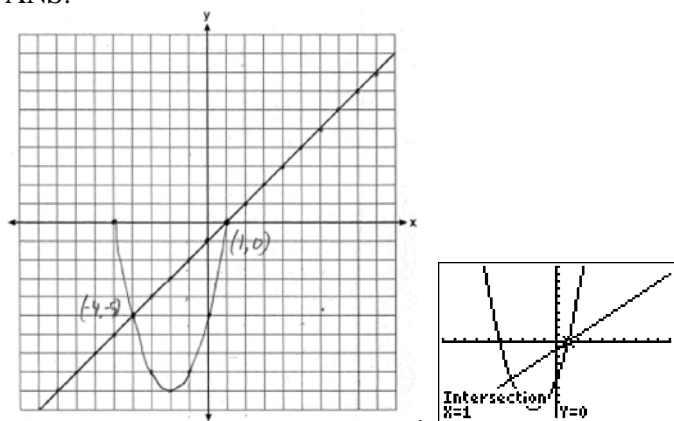


X	Y1	Y2
0	5	5
4	-3	-3
X=0		

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



398 ANS:



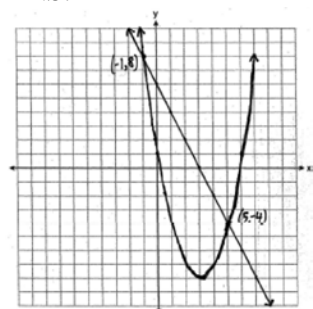
PTS: 4

REF: 080839ia

STA: A.G.9

TOP: Quadratic-Linear Systems

399 ANS:



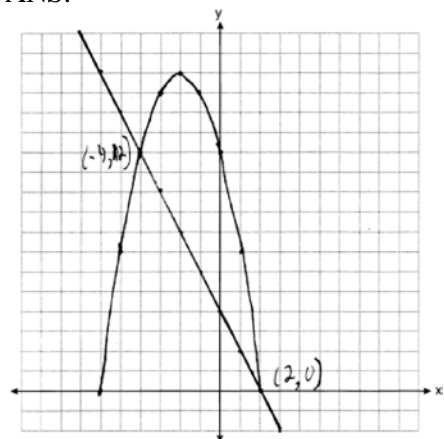
PTS: 4

REF: 060939ia

STA: A.G.9

TOP: Quadratic-Linear Systems

400 ANS:



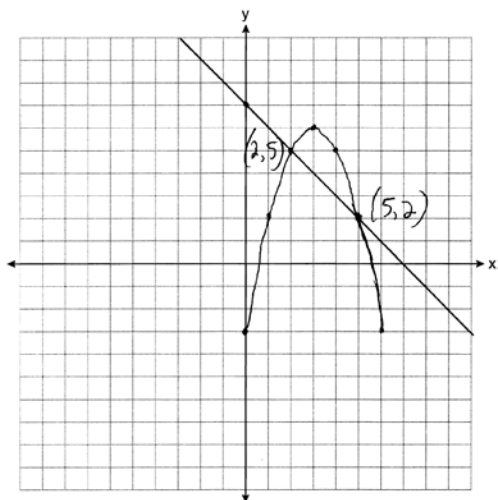
PTS: 4

REF: 061039ia

STA: A.G.9

TOP: Quadratic-Linear Systems

401 ANS:



PTS: 4 REF: 081138ia STA: A.G.9

TOP: Quadratic-Linear Systems

402 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

403 ANS: 3 PTS: 2 REF: 080819ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

404 ANS: 2 PTS: 2 REF: 060923ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

405 ANS: 3 PTS: 2 REF: 061003ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: addition

406 ANS: 1 PTS: 2 REF: 011126ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

407 ANS: 4 PTS: 2 REF: 061130ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

408 ANS: 1 PTS: 2 REF: 011213ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: addition

409 ANS: 4 PTS: 2 REF: 061226ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

410 ANS: 2 PTS: 2 REF: 081205ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: addition

411 ANS: 1 PTS: 2 REF: 060807ia

STA: A.A.13

TOP: Multiplication of Polynomials

412 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

413 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

414 ANS: 4 PTS: 2 REF: 061203ia STA: A.A.14

TOP: Division of Polynomials

415 ANS:

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

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

416 ANS: 4 PTS: 2 REF: 080903ia STA: A.A.12

TOP: Multiplication of Powers

417 ANS: 4 PTS: 2 REF: 011020ia STA: A.A.12

TOP: Multiplication of Powers

418 ANS: 3

$$\frac{3^6}{3^1} = 3^5$$

PTS: 2 REF: 061219ia STA: A.A.12 TOP: Division of Powers

419 ANS: 4

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

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

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

TOP: Division of Powers

421 ANS: 4 PTS: 2 REF: 061018ia STA: A.A.12

TOP: Division of Powers

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

TOP: Division of Powers

423 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

424 ANS:

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

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

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

TOP: Powers of Powers

426 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

427 ANS: 4

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

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

428 ANS: 2

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

429 ANS: 4

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

430 ANS: 4

PTS: 2 REF: 060927ia STA: A.N.4  
TOP: Operations with Scientific Notation

431 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

432 ANS: 2

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

433 ANS:

$$6.56 \times 10^{-2}$$

PTS: 2 REF: 081231ia STA: A.N.4 TOP: Operations with Scientific Notation

434 ANS: 3

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

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

435 ANS: 2

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

436 ANS: 4

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

437 ANS: 3

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

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

438 ANS: 2

$$R = 0.5^{d-1}$$

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

439 ANS: 1

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

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

440 ANS: 2

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

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

441 ANS: 2

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

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

442 ANS: 1

PTS: 2

REF: 011202ia

STA: A.A.9

TOP: Exponential Functions

443 ANS: 2

PTS: 2

REF: 061229ia

STA: A.A.9

TOP: Exponential Functions

444 ANS: 3

PTS: 2

REF: 081211ia

STA: A.A.9

TOP: Exponential Functions

445 ANS:

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

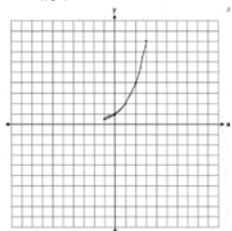
PTS: 3 REF: 060935ia STA: A.A.9 TOP: Exponential Functions

446 ANS:

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

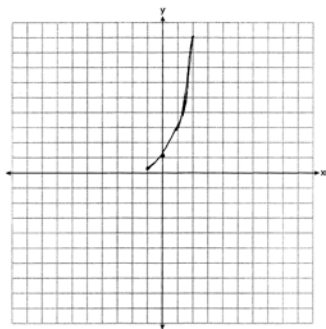
PTS: 4 REF: 011138ia STA: A.A.9 TOP: Exponential Functions

447 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

448 ANS:



PTS: 2 REF: 081233ia STA: A.G.4 TOP: Graphing Exponential Functions

449 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

450 ANS: 3

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

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

451 ANS: 2

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

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

452 ANS: 2

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

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

453 ANS: 3

$$3\sqrt{250} = 3\sqrt{25} \sqrt{10} = 15\sqrt{10}$$

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

454 ANS: 3

$$2\sqrt{45} = 2\sqrt{9} \sqrt{5} = 6\sqrt{5}$$

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

455 ANS:

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

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

456 ANS:

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

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

457 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

458 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

459 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

460 ANS:

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

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

461 ANS:

$$6\sqrt{3} \frac{3\sqrt{75} + \sqrt{27}}{3} = \frac{3\sqrt{25} \sqrt{3} + \sqrt{9} \sqrt{3}}{3} = \frac{15\sqrt{3} + 3\sqrt{3}}{3} = \frac{18\sqrt{3}}{3} = 6\sqrt{3}$$

PTS: 3 REF: 061236ia STA: A.N.3 TOP: Operations with Radicals

462 ANS:

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

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

463 ANS: 2

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

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

464 ANS: 2

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

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

465 ANS: 4

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

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

466 ANS: 2

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

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

467 ANS: 1

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

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

468 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

469 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

470 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

471 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

472 ANS: 1

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



- 473 ANS: 3                   PTS: 2                   REF: 060817ia           STA: A.A.15  
TOP: Undefined Rationals
- 474 ANS: 2                   PTS: 2                   REF: 010925ia           STA: A.A.15  
TOP: Undefined Rationals
- 475 ANS: 4                   PTS: 2                   REF: 060916ia           STA: A.A.15  
TOP: Undefined Rationals
- 476 ANS: 1  
 $x^2 + 7x + 10 = 0$   
 $(x + 5)(x + 2) = 0$   
 $x = -5$  or  $-2$
- PTS: 2                   REF: 080918ia           STA: A.A.15           TOP: Undefined Rationals
- 477 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
- 478 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
- 479 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
- 480 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
- 481 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

## Integrated Algebra Regents Exam Questions by Performance Indicator: Topic Answer Section

482 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

483 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

484 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

485 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

486 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

487 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

488 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

489 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

490 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

491 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

492 ANS: 4

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

493 ANS: 1

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

494 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

495 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

496 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

497 ANS: 2

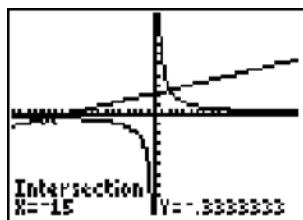
$$\frac{2y}{y+5} + \frac{10}{y+5} = \frac{2y+10}{y+5} = \frac{2(y+5)}{y+5} = 2$$

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

498 ANS: 1

PTS: 2 REF: 061220ia STA: A.A.17  
TOP: Addition and Subtraction of Rationals

499 ANS: 4



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

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

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

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

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

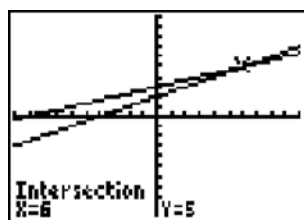
PTS: 2

REF: 060826ia

STA: A.A.26

TOP: Solving Rationals

500 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

501 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

502 ANS: 4

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

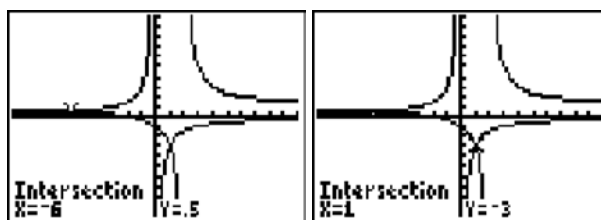
$$x(x+2) = -3(x-2)$$

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

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

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

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



PTS: 2

REF: 011028ia

STA: A.A.26

TOP: Solving Rationals

503 ANS: 2

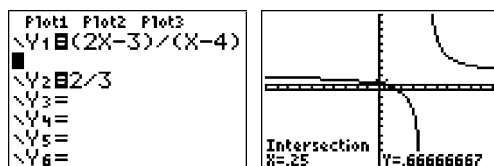
$$\frac{2x-3}{x-4} = \frac{2}{3}$$

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

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

$$4x = 1$$

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



PTS: 2

REF: 081012ia

STA: A.A.26

TOP: Solving Rationals

504 ANS: 3

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

$$x^2 + 2x + 1 = 4$$

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

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

$$x = -3, 1$$

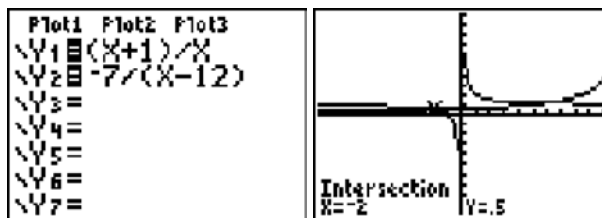
PTS: 2

REF: 081226ia

STA: A.A.26

TOP: Solving Rationals

505 ANS:



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

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

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

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

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

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

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

506 ANS:

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

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

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

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

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

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

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

507 ANS:

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

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

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

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

$$16x = -36$$

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

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

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

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

- 510 ANS: 1                   PTS: 2                   REF: 010905ia           STA: A.G.4  
TOP: Families of Functions
- 511 ANS: 4                   PTS: 2                   REF: 081025ia           STA: A.G.4  
TOP: Families of Functions
- 512 ANS: 4                   PTS: 2                   REF: 061111ia           STA: A.G.4  
TOP: Families of Functions
- 513 ANS: 3                   PTS: 2                   REF: 081118ia           STA: A.G.4  
TOP: Families of Functions
- 514 ANS: 3                   PTS: 2                   REF: 080925ia           STA: A.G.4  
TOP: Identifying the Equation of a Graph
- 515 ANS: 4                   PTS: 2                   REF: 061221ia           STA: A.G.4  
TOP: Identifying the Equation of a Graph
- 516 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
- 517 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
- 518 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
- 519 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
- 520 ANS: 4                   PTS: 2                   REF: fall0730ia           STA: A.G.3  
TOP: Defining Functions
- 521 ANS: 4                   PTS: 2                   REF: 010930ia           STA: A.G.3  
TOP: Defining Functions
- 522 ANS: 3                   PTS: 2                   REF: 060919ia           STA: A.G.3  
TOP: Defining Functions
- 523 ANS: 4                   PTS: 2                   REF: 061013ia           STA: A.G.3  
TOP: Defining Functions
- 524 ANS: 3                   PTS: 2                   REF: 011204ia           STA: A.G.3  
TOP: Defining Functions
- 525 ANS: 1                   PTS: 2                   REF: 061209ia           STA: A.G.3  
TOP: Defining Functions
- 526 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

- 527 ANS: 3                   PTS: 2                   REF: 060825ia           STA: A.A.45  
TOP: Pythagorean Theorem
- 528 ANS: 4  
 $16^2 + b^2 = 34^2$   
 $b^2 = 900$   
 $b = 30$
- PTS: 2                   REF: 080809ia           STA: A.A.45           TOP: Pythagorean Theorem
- 529 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
- 530 ANS: 1  
 $8^2 + 15^2 = c^2$   
 $c^2 = 289$   
 $c = 17$
- PTS: 2                   REF: 080906ia           STA: A.A.45           TOP: Pythagorean Theorem
- 531 ANS: 2  
 $\sqrt{5^2 + 7^2} \approx 8.6$
- PTS: 2                   REF: 081004ia           STA: A.A.45           TOP: Pythagorean Theorem
- 532 ANS: 2  
 $\sqrt{18.4^2 - 7^2} \approx 17$
- PTS: 2                   REF: 011107ia           STA: A.A.45           TOP: Pythagorean Theorem
- 533 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
- 534 ANS: 1  
 $\sqrt{1700^2 - 1300^2} \approx 1095$
- PTS: 2                   REF: 011221ia           STA: A.A.45           TOP: Pythagorean Theorem



535 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

536 ANS: 1

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

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

537 ANS: 2

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

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

538 ANS: 3

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

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

539 ANS: 2

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

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

540 ANS: 2

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

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

541 ANS: 1

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

PTS: 2 REF: 011109ia STA: A.A.42 TOP: Trigonometric Ratios

542 ANS: 2

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

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

543 ANS: 3

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

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

544 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

545 ANS: 2

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

$$x \approx 15.6$$

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

546 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

547 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

548 ANS: 3

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

$$x \approx 21$$

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

549 ANS:

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

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

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

550 ANS:

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

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

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

551 ANS:

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

$$x \approx 2.1$$

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

552 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

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

TOP: Using Trigonometry to Find an Angle

554 ANS: 3

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

$$A \approx 38.7$$

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

555 ANS: 1 PTS: 2 REF: 061114ia STA: A.A.43

TOP: Using Trigonometry to Find an Angle

556 ANS:

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

$$A \approx 53$$

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

557 ANS:

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

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

$$x \approx 37$$

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

558 ANS:

$$78. \cos x = \frac{6}{28}$$

$$x \approx 78$$

PTS: 3

REF: 061235ia

STA: A.A.43

TOP: Using Trigonometry to Find an Angle

559 ANS:

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

$$A \approx 41.8$$

PTS: 3

REF: 081135ia

STA: A.A.43

TOP: Using Trigonometry to Find an Angle

560 ANS:

$$54, 23. \cos A = \frac{17}{29} \cdot \sqrt{29^2 - 17^2} \approx 23$$

$$x \approx 54$$

PTS: 4

REF: 081238ia

STA: A.A.43

TOP: Using Trigonometry to Find an Angle

561 ANS: 2

PTS: 2

REF: 080815ia

STA: A.G.1

TOP: Compositions of Polygons and Circles

KEY: area

562 ANS: 1

PTS: 2

REF: 080924ia

STA: A.G.1

TOP: Compositions of Polygons and Circles

KEY: perimeter

563 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

564 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

565 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

566 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

567 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

568 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

569 ANS:

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

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

570 ANS:

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

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

571 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

572 ANS:

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

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

573 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

574 ANS: 2

$$1.5^3 = 3.375$$

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

575 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

576 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

577 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

578 ANS:

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

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

579 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

580 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

581 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

582 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

583 ANS:

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

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

584 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

585 ANS:

$$147.75 \quad 2 \times 5.5 \times 3 + 2 \times 6.75 \times 3 + 2 \times 5.5 \times 6.75 = 147.75$$

PTS: 2 REF: 011231ia STA: A.G.2 TOP: Surface Area