



Arkansas Comprehensive Testing, Assessment, and Accountability Program

Released Item Booklet

Algebra I Mid-Year End-of-Course Examination

January 2010 Administration

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Arkansas Department of Education

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PART I Overview

The criterion-referenced tests implemented as part of the **Arkansas Comprehensive Testing, Assessment, and Accountability Program** (ACTAAP) are being developed in response to Arkansas Legislative Act 35, which requires the State Board of Education to develop a comprehensive testing program that includes assessment of the challenging academic content standards defined by the Arkansas Curriculum Frameworks.

As part of this program, students in Arkansas public schools who had completed or were completing Algebra I by the end of the first semester participated in the *Algebra I Mid-Year End-of-Course Examination* in January 2010.

This Released Item Booklet for the *Algebra I Mid-Year End-of-Course Examination* contains test questions or items that were asked of students during the January 2010 operational administration. The test items included in Part II of this booklet are some of the items that contributed to the student performance results for that administration.

Students were given approximately an hour and a half each day to complete assigned test sessions during the two days of testing in January 2010. Students were permitted to use a calculator for both multiple-choice and open-response items. Students were also supplied with a reference sheet to be used so that all students would have equal access to this information during testing. (See the reference sheet on page 17 of this booklet.) All of the multiple-choice items within this booklet have the correct response marked with an asterisk (*).

The development of the *Algebra I Mid-Year End-of-Course Examination* was based on the *Arkansas Algebra I Mathematics Curriculum Framework*. This framework has distinct levels: Strands to be taught in concert, Content Standards within each Strand, and Student Learning Expectations within each Content Standard. An abridged version of the *Arkansas Algebra I Mathematics Curriculum Framework* can be found in Part III of this booklet. It is important to note that this abridged version lists only the predominant Strand, Content Standard, and Student Learning Expectation associated with each item. However, since many key concepts within the *Arkansas Algebra I Mathematics Curriculum Framework* are interrelated, in many cases there are other item correlations or associations across Strands, Content Standards, and Student Learning Expectations.

Part IV of the Released Item Booklet contains a tabular listing of the Strand, Content Standard, and Student Learning Expectation that each question was designed to assess. The multiple-choice and open-response items found on the *Algebra I Mid-Year End-of-Course Examination* were developed in close association with the Arkansas education community. Arkansas teachers participated as members of the Algebra I Content Advisory Committee, providing routine feedback and recommendations for all items. The number of items associated with specific Strands, Content Standards, and Student Learning Expectations was based on approximate proportions suggested by the Content Advisory Committee, and their recommendations were accommodated to the greatest extent possible given the overall test design. Part IV of the Released Item Booklet provides Arkansas educators with specific information on how the *Algebra I Mid-Year End-of-Course Examination* items align or correlate with the *Arkansas Algebra I Mathematics Curriculum Framework* to provide models for classroom instruction.

PART I Scoring Student Responses to Algebra I Open-Response Items

While multiple-choice items are scored by machine to determine if the student chose the correct answer from four options, responses to open-response items must be scored by trained “readers” using a pre-established set of scoring criteria.

The Arkansas Algebra I Rangefinding Committee assisted in the development of the scoring criteria. The committee comprises active Arkansas educators with expertise in mathematics education.

Reader Training

Before readers are allowed to begin assigning scores to any student responses, they go through intensive training. The first step in that training is for the readers to read the Algebra I open-response items as they appear in the test booklet and to respond—just as the student test takers are required to do. This step gives the readers some insight into how the students might have responded. The next step is the readers’ introduction to the scoring rubric. All of the specific requirements of the rubric are explained by the Scoring Director who has been specifically trained to lead the scoring group. Then responses (anchor papers) that illustrate the score points of the rubric are presented to the readers and discussed. The goal of this discussion is for the readers to understand why a particular response (or type of response) receives a particular score. After discussion of the rubric and anchor papers, readers practice scoring sets of responses that have been pre-scored and selected for use as training papers. Detailed discussion of the responses and the scores they receive follows.

After three or four of these practice sets, readers are given “qualifying rounds.” These are additional sets of pre-scored papers, and, in order to qualify, each reader must score in exact agreement on at least 80% of the responses and have no more than 5% non-adjacent agreement on the responses. Readers who do not score within the required rate of agreement are not allowed to score the *Algebra I Mid-Year End-of-Course Examination* responses.

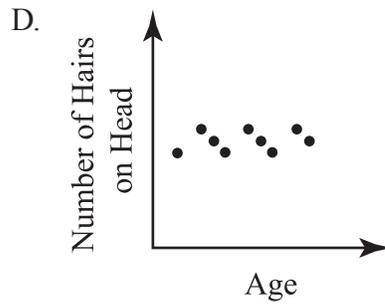
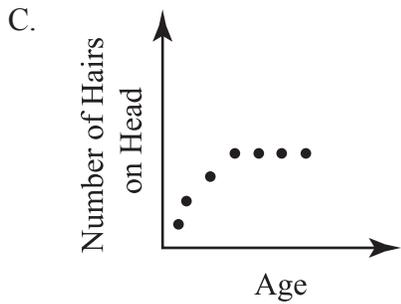
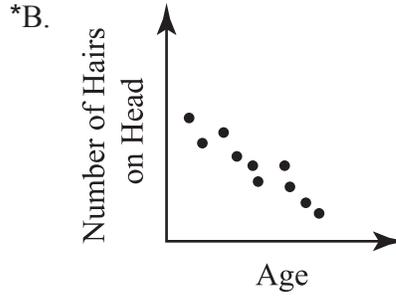
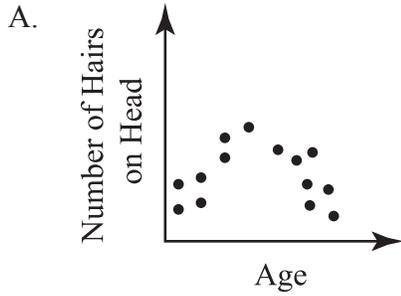
Once scoring of the actual student responses begins, readers are monitored constantly throughout the project to ensure that they are scoring according to the criteria. Daily and cumulative statistics are posted and analyzed, and Scoring Directors or Team Leaders reread selected responses scored by the readers. These procedures promote reliable and consistent scoring. Any reader who does not maintain an acceptable level of agreement is dismissed from the project.

Scoring Procedures

All student responses to the *Algebra I Mid-Year End-of-Course Examination* open-response test items are scored independently by two readers. Those two scores are compared, and responses that receive scores that are non-adjacent (a “1” and a “3,” for example) are scored a third time by a Team Leader or the Scoring Director for resolution.

PART II Released Algebra I Items

1. Which scatterplot shows that the number of hairs on a head constantly decreases over time?

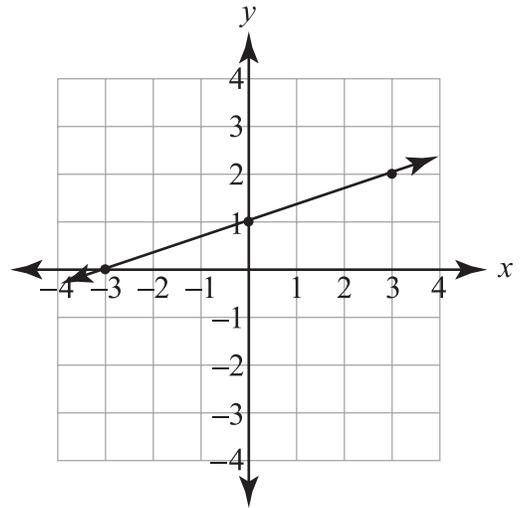


2. What is the simplest form of the expression below?

$$4\sqrt{2} + 3\sqrt{2} - 5\sqrt{2}$$

- *A. $2\sqrt{2}$
- B. $2\sqrt{6}$
- C. $7\sqrt{2}$
- D. $12\sqrt{2}$

3. What is the equation of the line graphed below?



- *A. $y = \frac{1}{3}x + 1$
- B. $y = \frac{1}{3}x - 3$
- C. $y = 3x + 1$
- D. $y = 3x - 3$

PART II Released Algebra I Items

4. What is the relationship between the lines with equations $y = \frac{5}{2}x - 12$ and $y = \frac{5}{2}x + 6$?

- *A. They are parallel lines.
- B. They are the same line.
- C. They are perpendicular lines.
- D. They are neither parallel nor perpendicular.

5. What is the solution to the equation below?

$$3x + 1 = x + 5$$

- A. 1.0
- B. 1.5
- *C. 2.0
- D. 3.0

6. Which table, showing the distance that four different cars traveled during a four-hour period, demonstrates a linear relationship between time and distance?

A.

Time (hours)	Distance Traveled (miles)
1	55
2	110
3	160
4	205

*B.

Time (hours)	Distance Traveled (miles)
1	55
2	110
3	165
4	220

C.

Time (hours)	Distance Traveled (miles)
1	55
2	110
3	170
4	235

D.

Time (hours)	Distance Traveled (miles)
1	55
2	110
3	190
4	245

7. What is the greatest common factor of $30xy$, $35y^2$, and $50x^2y^2$?

- *A. $5y$
- B. $30y$
- C. $21x^2y^2$
- D. $10x^2y^2$

PART II Released Algebra I Items

8. Which set of ordered pairs represents a function?

- A. $\{(4, 3), (1, 7), (-4, 3), (1, 8)\}$
- B. $\{(5, 4), (5, -3), (3, 7), (2, 1)\}$
- C. $\{(-3, 1), (4, -2), (-3, 0), (7, 8)\}$
- *D. $\{(1, -4), (2, -3), (3, -2), (4, -1)\}$

Use the matrices below to answer question 9.

$$\begin{array}{c}
 \text{Todd} \\
 \begin{array}{cc}
 \mathbf{S} & \mathbf{Q} \\
 \left[\begin{array}{cc}
 4 & 10 \\
 4 & 10 \\
 8 & 6 \\
 12 & 8
 \end{array} \right]
 \end{array}
 \end{array}$$

$$\begin{array}{c}
 \text{Jim} \\
 \begin{array}{cc}
 \mathbf{S} & \mathbf{Q} \\
 \left[\begin{array}{cc}
 11 & 6 \\
 10 & 7 \\
 11 & 9 \\
 10 & 11
 \end{array} \right]
 \end{array}
 \end{array}$$

S = Speedyman Comics

Q = Quantraman Comics

9. Todd and Jim are going to combine their comic books. Which matrix represents the total?

A.
$$\begin{array}{c}
 \text{Total} \\
 \begin{array}{cc}
 \mathbf{S} & \mathbf{Q} \\
 \left[\begin{array}{cc}
 10 & 21 \\
 11 & 20 \\
 17 & 17 \\
 23 & 18
 \end{array} \right]
 \end{array}
 \end{array}$$

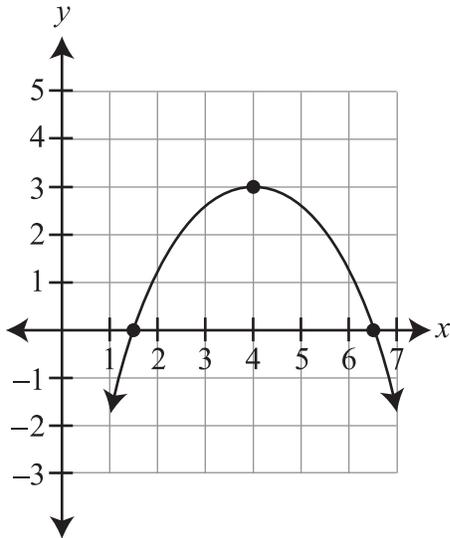
B.
$$\begin{array}{c}
 \text{Total} \\
 \begin{array}{cc}
 \mathbf{S} & \mathbf{Q} \\
 \left[\begin{array}{cc}
 -7 & 4 \\
 -6 & 3 \\
 3 & -3 \\
 2 & -3
 \end{array} \right]
 \end{array}
 \end{array}$$

*C.
$$\begin{array}{c}
 \text{Total} \\
 \begin{array}{cc}
 \mathbf{S} & \mathbf{Q} \\
 \left[\begin{array}{cc}
 15 & 16 \\
 14 & 17 \\
 19 & 15 \\
 22 & 19
 \end{array} \right]
 \end{array}
 \end{array}$$

D.
$$\begin{array}{c}
 \text{Total} \\
 \begin{array}{cc}
 \mathbf{S} & \mathbf{Q} \\
 \left[\begin{array}{cc}
 11 & 10 \\
 10 & 10 \\
 11 & 9 \\
 12 & 11
 \end{array} \right]
 \end{array}
 \end{array}$$

PART II Released Algebra I Items

10. Which statement is true about the function graphed below?



- A. The maximum value occurs at the vertex with coordinates (3, 4).
- *B. The maximum value occurs at the vertex with coordinates (4, 3).
- C. The minimum value occurs at the vertex with coordinates (3, 4).
- D. The minimum value occurs at the vertex with coordinates (4, 3).
11. Simplify the expression below.

$$2^2 + 4^2 - (48 \div 2) \div (6 - 8 \div 2)$$

- A. -2
- *B. 8
- C. 24
- D. 44

12. What is the midpoint of the segment with endpoints $(-7, 4)$ and $(9, 7)$?

- A. $\left(1, 1\frac{1}{2}\right)$
- B. $\left(8, 1\frac{1}{2}\right)$
- *C. $\left(1, 5\frac{1}{2}\right)$
- D. $\left(-1\frac{1}{2}, 5\frac{1}{2}\right)$

13. Which is the **correct** factorization of the equation $x^2 + 6x + 8 = 0$?

- *A. $(x + 4)(x + 2) = 0$
- B. $(x + 8)(x + 1) = 0$
- C. $(x + 5)(x + 3) = 0$
- D. $(x - 4)(x - 2) = 0$

PART II Released Algebra I Items

14. Mr. Dewey, Mr. Smith, and Mr. Howe manage three different used-car lots. The inventory of each brand of trucks, vans, and cars is shown in the matrices below.

Dewey				Smith				Howe			
	Trucks	Vans	Cars		Trucks	Vans	Cars		Trucks	Vans	Cars
Brand A	10	12	14	Brand A	6	7	10	Brand A	6	12	14
Brand B	5	10	15	Brand B	10	12	14	Brand B	12	12	12
Brand C	3	6	9	Brand C	6	5	4	Brand C	10	8	6

If they combined their businesses, how many Brand A vans would they have altogether?

- A. 12
- B. 28
- *C. 31
- D. 84

15. What is the value of x , if $\frac{3}{4}x - 3 = -2x + 8$?

- *A. $x = 4$
- B. $x = -4$
- C. $x = \frac{121}{4}$
- D. $x = -\frac{25}{4}$

16. Assuming no denominator equals 0, which is the completely simplified form of the expression below?

$$\frac{8a^3 + 2a^2 + 4a}{2a}$$

- A. $8a + 1 + \frac{2}{a}$
- *B. $4a^2 + a + 2$
- C. $4a^2 + 2a + 1$
- D. $8a^2 + 2a + 4$

17. What is 4.5×10^7 multiplied by 5.4×10^3 , in scientific notation?

- A. 2.4×10^4
- B. 2.4×10^{10}
- *C. 2.4×10^{11}
- D. 2.4×10^{21}

PART II Released Algebra I Items

18. The table below shows a relationship between the total cost of purchasing books through a book club and the number of books purchased.

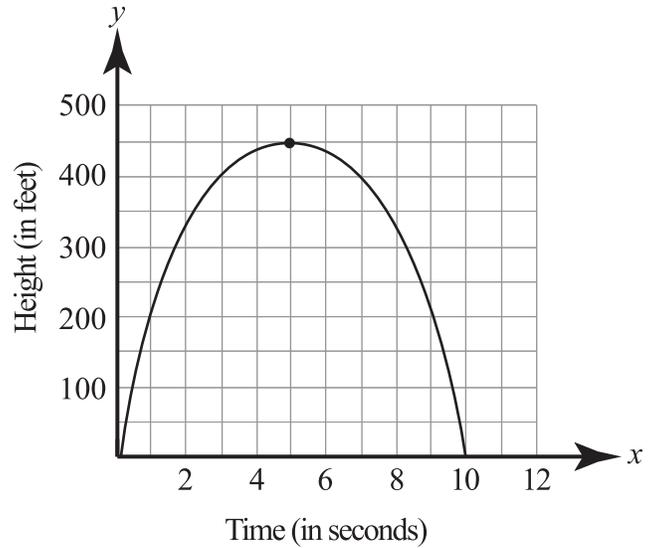
Total Cost in Terms of Books Purchased

Books Purchased, x	0	1	2
Cost, y	\$10	\$25	\$40

What is the function's independent variable?

- A. \$10
- B. \$15
- C. cost of the club
- *D. number of books purchased

19. The graph below represents the relationship between the time, in seconds, an arrow is shot upward and its height, in feet.



From the time it was shot, how long does it take for the arrow to return to the ground, and what is its maximum height?

- A. 5 seconds, 450 feet
- *B. 10 seconds, 450 feet
- C. 10 seconds, 500 feet
- D. 450 seconds, 10 feet

PART II Released Algebra I Items

20. Mary scored 13 points in the first 11 minutes of a 32-minute basketball game. If she continues to score at the same rate, **approximately** how many points will she score in this game?

- A. 45
- *B. 38
- C. 27
- D. 25

21. A function is completely defined by the table below.

x	y
0	5
2	10
10	2
-3	9

What are the function's domain and range?

- *A. Domain = $\{-3, 0, 2, 10\}$;
Range = $\{2, 5, 9, 10\}$
- B. Domain = $\{0, 10\}$; Range = $\{2, 10\}$
- C. Domain = $\{2, 10\}$; Range = $\{-3, 10\}$
- D. Domain = $\{-3, 9\}$; Range = $\{10, 2\}$

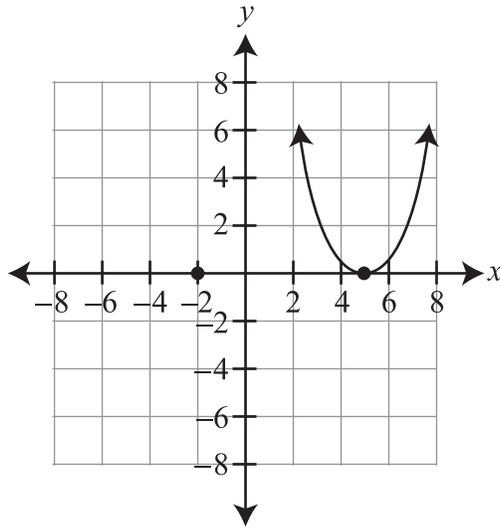
22. Which algebraic expression corresponds to the word phrase below?

Five times the sum of twice a number and -5

- A. $5 + 2(n - 5)$
- B. $5 + 2n - 5$
- C. $5(2n + 5)$
- *D. $5(2n - 5)$

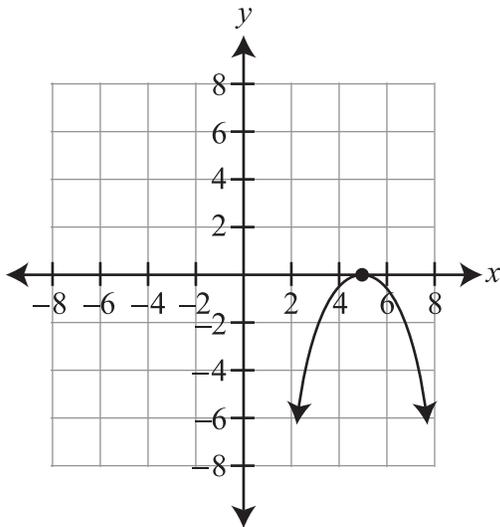
PART II Released Algebra I Items

23. The graph of a function is shown below.

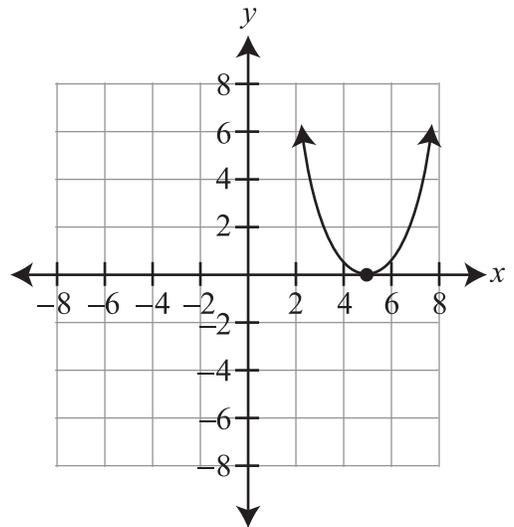


Which is the image of the graph above after a reflection over the x -axis?

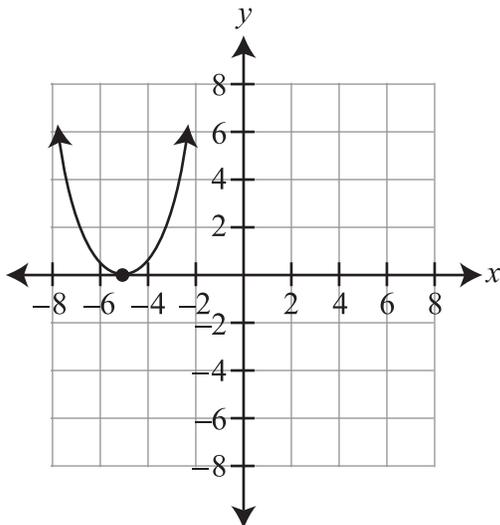
*A.



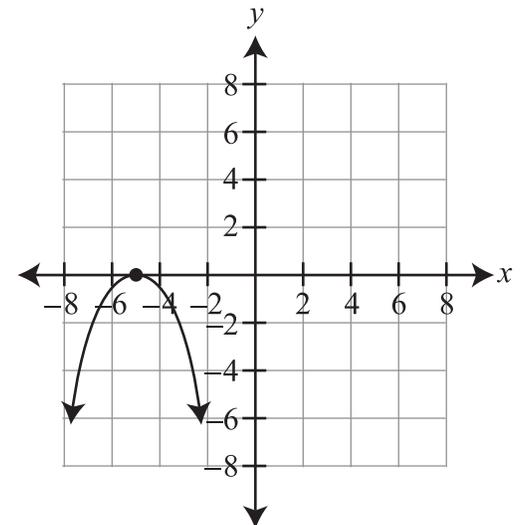
B.



C.

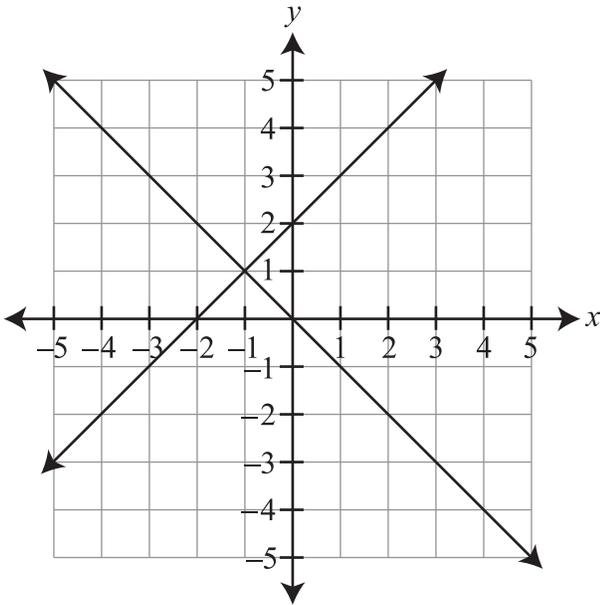


D.



PART II Released Algebra I Items

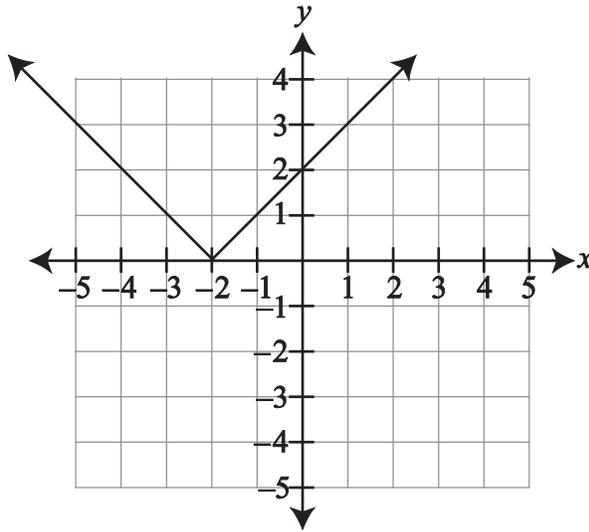
24. Which ordered pair is the solution to the system of equations graphed below?



- A. (0, 0)
- B. (0, 2)
- C. (-2, 0)
- *D. (-1, 1)

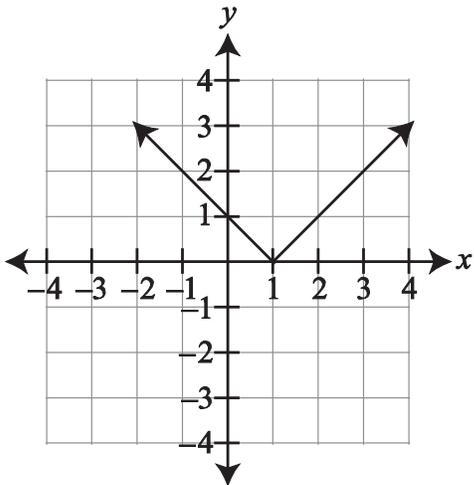
PART II Released Algebra I Items

25. The graph of a function is shown below.

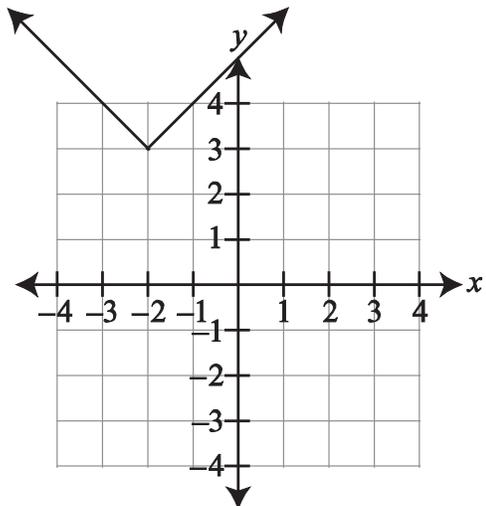


Which is the image of the graph after a vertical shift of -3 ?

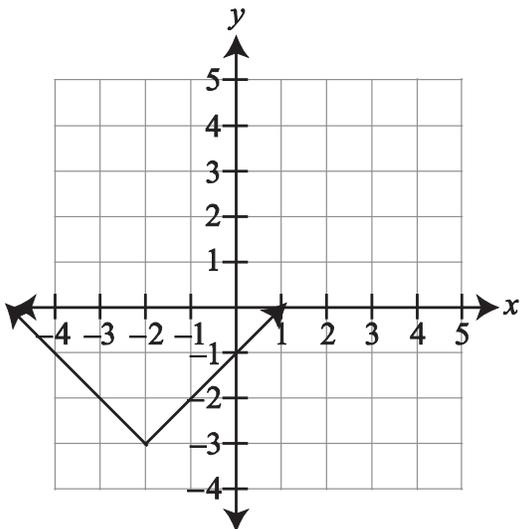
A.



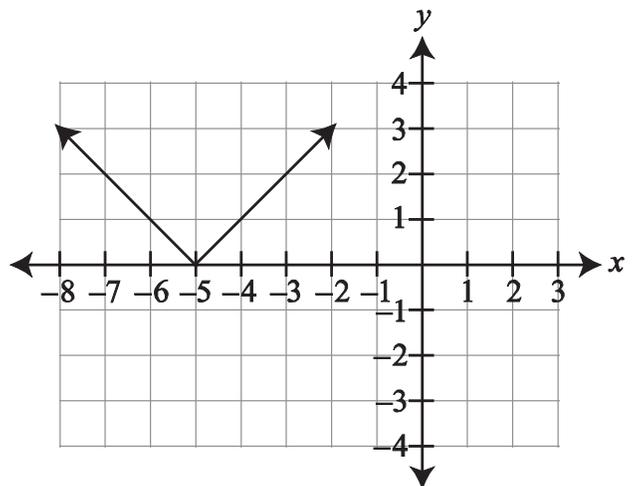
B.



*C.

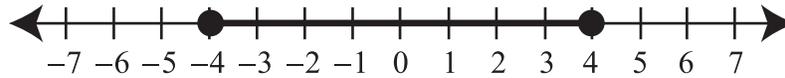


D.



PART II Released Algebra I Items

26. Which inequality has the solution set represented by the graph below?



- A. $|x| < 4$
- *B. $|x| \leq 4$
- C. $|x| > 4$
- D. $|x| \geq 4$

27. At a restaurant's buffet, the price of takeout depends on the weight of the food and its container. The buffet takeout costs \$4.50 per pound. Which equation describes this function?

- A. $f(x) = \$4.50 + x$
- B. $f(x) = \$4.50 - x$
- C. $f(x) = \$4.50 \div x$
- *D. $f(x) = \$4.50x$

28. Which is equivalent to the expression $(8x + 5) - (2x - 5)$?

- A. $6x$
- B. $10x$
- *C. $6x + 10$
- D. $-16x^2 + 30x + 25$

PART II Released Algebra I Items

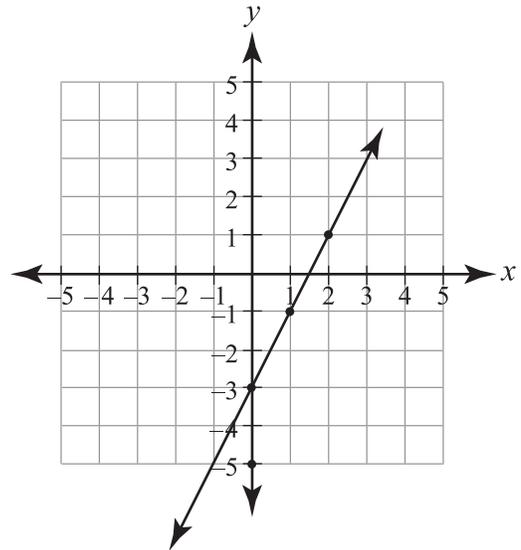
29. A lawncare company recorded the distribution of lawn sizes in a subdivision, as shown in the table below.

Size of Lawn (ft ²)	Number of Lawns
1,000–1,499	2
1,500–1,999	12
2,000–2,499	27
2,500–2,999	19
3,000–3,499	6
3,500–3,999	3

If the company wanted to construct a cumulative frequency histogram for these data, what would the top of the bar read for the 2,000–2,499 group?

- A. 12
- B. 14
- C. 27
- *D. 41

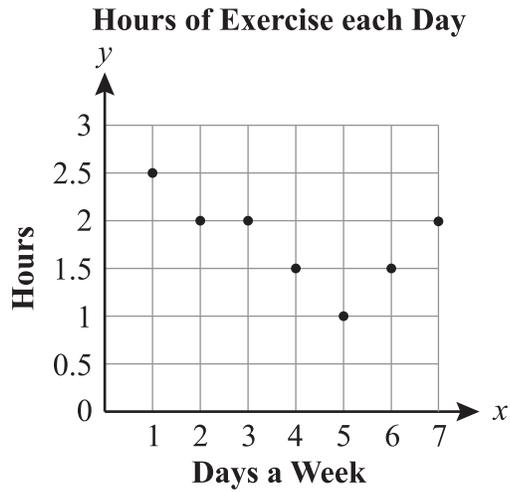
30. Michael graphed the line $y = -2x - 3$.



What mistake did Michael make?

- *A. He graphed a slope of 2.
 - B. He graphed a slope of -2 .
 - C. He graphed a slope of $\frac{1}{2}$.
 - D. He graphed the y -intercept as -3 .
31. A glass jar contains 8 red, 6 green, 3 blue, and 3 yellow marbles. Zeke randomly picks a red marble. Without replacing the red marble, he randomly picks a second marble. What is the probability of Zeke choosing another red marble?
- A. $\frac{7}{8}$
 - B. $\frac{7}{16}$
 - *C. $\frac{7}{19}$
 - D. $\frac{7}{20}$

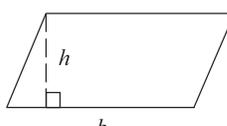
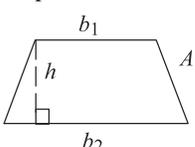
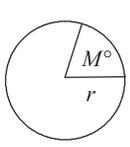
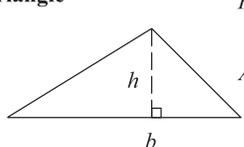
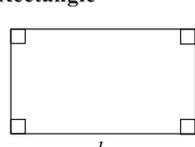
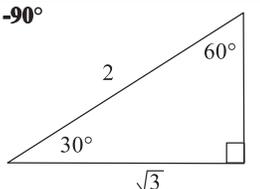
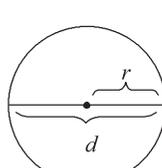
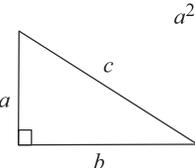
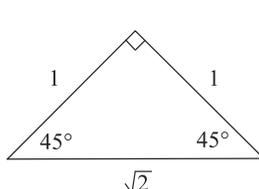
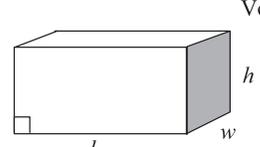
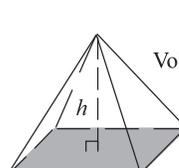
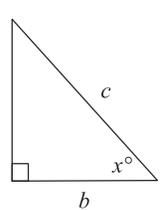
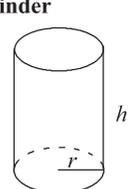
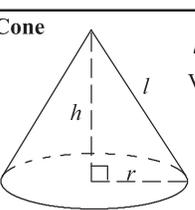
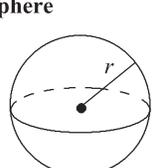
Use the graph below to answer question 32.



32. The graph above shows the number of hours of exercise Ladonna completed each day. Which best describes the trend shown in the graph as the week progresses?
- A. The amount of exercise increases steadily.
 - B. The amount of exercise increases, then decreases.
 - C. The amount of exercise decreases steadily.
 - *D. The amount of exercise decreases, then increases.

PART II End-of-Course Mathematics Reference Sheet

End-of-Course Mathematics Reference Sheet

<p>Parallelogram</p>  <p>$P =$ sum of all sides $A = bh$</p>	<p>Trapezoid</p>  <p>$A = \frac{h(b_1 + b_2)}{2}$</p>	<p>Arc and Sector</p>  <p>Arc Length = $\left(\frac{M}{360}\right) \times 2\pi r$ Sector area = $\left(\frac{M}{360}\right) \times \pi r^2$</p>
<p>Triangle</p>  <p>$P =$ sum of all sides $A = \frac{bh}{2}$</p>	<p>Rectangle</p>  <p>$P = 2l + 2w$ $A = lw$</p>	<p>30° -60° -90°</p> 
<p>Circle</p>  <p>$C = 2\pi r$ $C = \pi d$ $A = \pi r^2$ $\pi \approx 3.14$</p>	<p>Pythagorean Theorem</p>  <p>$a^2 + b^2 = c^2$</p>	<p>45° -45° -90°</p> 
<p>Rectangular Solid</p>  <p>Volume = lwh Surface area = $2lw + 2lh + 2wh$</p>	<p>Pyramid</p>  <p>$B =$ area of base (shaded) Volume = $\frac{Bh}{3}$</p>	<p>Trigonometric Ratios</p>  <p>$\sin x^\circ = \frac{a}{c}$ $\cos x^\circ = \frac{b}{c}$ $\tan x^\circ = \frac{a}{b}$</p>
<p>Cylinder</p>  <p>Volume = $\pi r^2 h$ Surface area = $2\pi r h + 2\pi r^2$</p>	<p>Cone</p>  <p>$l =$ slant height Volume = $\frac{\pi r^2 h}{3}$ Surface area = $\pi r l + \pi r^2$</p>	<p>Sphere</p>  <p>Volume = $\frac{4\pi r^3}{3}$ Surface area = $4\pi r^2$</p>

Miscellaneous Formulas	Area of an equilateral triangle	$A = \frac{s^2\sqrt{3}}{4}$ $s =$ length of a side
	Distance	rate \times time
	Interest	principal \times rate \times time in years
	Sum of the angles of a polygon having n sides	$(n - 2)180^\circ$
	Distance between points on a coordinate plane	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
	Midpoint	$\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right)$
	Slope of a nonvertical line (where $x_2 \neq x_1$)	$m = \frac{y_2 - y_1}{x_2 - x_1}$
	Slope intercept (where $m =$ slope, $b =$ intercept)	$y = mx + b$
	Last term of an arithmetic series	$a_n = a + (n - 1)d$
	Last term of a geometric series (where $n \geq 1$)	$a_n = ar^{n-1}$
	Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
	Area of a square	$A = s^2$
	Volume of a cube	$V = s^3$
Area of a regular polygon	$A = \frac{1}{2}ap$ $a =$ apothem, $p =$ perimeter	

PART III Curriculum Framework

The Arkansas Algebra I Mathematics Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
1. LANGUAGE OF ALGEBRA (LA)	1. Students will develop the language of algebra including specialized vocabulary, symbols, and operations.	<ol style="list-style-type: none"> 1. Evaluate algebraic expressions, including radicals, by applying the order of operations. 2. Translate word phrases and sentences into expressions, equations, and inequalities, and vice versa. 3. Apply the laws of (integral) exponents and roots. 4. Solve problems involving scientific notation, including multiplication and division. 5. Perform polynomial operations (addition, subtraction, multiplication) with and without manipulatives. 6. Simplify algebraic fractions by factoring. 7. Recognize when an expression is undefined. 8. Simplify radical expressions such as $\sqrt[3]{7}$. 9. Add, subtract, and multiply simple radical expressions like $3\sqrt{20} + 7\sqrt{5}$ and $4\sqrt{5} \cdot 2\sqrt{3}$.
2. SOLVING EQUATIONS AND INEQUALITIES (SEI)	2. Students will write, with and without appropriate technology, equivalent forms of equations, inequalities, and systems of equations, and solve with fluency.	<ol style="list-style-type: none"> 1. Solve multi-step equations and inequalities with rational coefficients <ul style="list-style-type: none"> • numerically (from a table or guess and check) • algebraically (including the use of manipulatives) • graphically • technologically 2. Solve systems of two linear equations <ul style="list-style-type: none"> • numerically (from a table or guess and check) • algebraically (including the use of manipulatives) • graphically • technologically 3. Solve linear formulas and literal equations for a specified variable (Ex. Solve for p in $l = prt$.) 4. Solve and graph simple absolute value equations and inequalities. Ex. $x = 5, x \leq 5, x > 5$ 5. Solve real-world problems that involve a combination of rates, proportions, and percents. 6. Solve problems involving direct variation and indirect (inverse) variation to model rates of change. 7. Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and Pythagorean Theorem). 8. Communicate real-world problems graphically, algebraically, numerically, and verbally.
3. LINEAR FUNCTIONS (LF)	3. Students will analyze functions by investigating rates of change, intercepts, and zeros.	<ol style="list-style-type: none"> 1. Distinguish between functions and nonfunctions/relations by inspecting graphs, ordered pairs, mapping diagrams, and/or tables of data. 2. Determine domain and range of a relation from an algebraic expression, graphs, set of ordered pairs, or table of data. 3. Know and/or use function notation, including evaluating functions for given values in their domain. 4. Identify independent variables and dependent variables in various representational modes: words, symbols, and/or graphs. 5. Interpret the rate of change/slope and intercepts within the context of everyday life. Ex. telephone charges based on base rate (y-intercept) plus rate per minute (slope) 6. Calculate the slope given. <ul style="list-style-type: none"> • two points • the graph of a line • the equation of a line 7. Determine by using slope whether a pair of lines are parallel, perpendicular, or neither. 8. Write an equation in slope-intercept, point-slope, and standard forms, given <ul style="list-style-type: none"> • two points • a point and y-intercept • x-intercept and y-intercept • a point and slope • a table of data • the graph of a line 9. Describe the effects of parameter changes, slope, and/or y-intercepts, on graphs of linear functions and vice versa.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the January 2010 Mid-Year End-of-Course Algebra I Examination.

PART III Curriculum Framework

The Arkansas Algebra I Mathematics Curriculum Framework*

Strands	Content Standards	Student Learning Expectations
4. NON-LINEAR FUNCTIONS (NLF)	4. Students will compare the properties in the family of functions.	<ol style="list-style-type: none"> 1. Factor polynomials. <ul style="list-style-type: none"> • greatest common factor • binomials (difference of squares) • trinomials 2. Determine minimum, maximum, vertex, and zeros, given the graph. 3. Solve quadratic equations using the appropriate methods with and without technology. <ul style="list-style-type: none"> • factoring • quadratic formula with real-number solutions 4. Recognize function families and their connections, including vertical shift and reflection over the x-axis. <ul style="list-style-type: none"> • quadratics (with rational coefficients) • absolute value • exponential functions 5. Communicate real-world problems graphically, algebraically, numerically, and verbally.
5. DATA INTERPRETATION AND PROBABILITY (DIP)	5. Students will compare various methods of reporting data to make inferences or predictions.	<ol style="list-style-type: none"> 1. Construct and use scatterplots and line of best fit to make inferences in real-life situations. 2. Use simple matrices in addition, subtraction, and scalar multiplication. 3. Construct simple matrices for real-life situations. 4. Determine the effects of changes in the data set on the measures of central tendency. 5. Use two or more graphs (i.e., box-and-whisker, histograms, scatter plots) to compare data. 6. Construct and interpret a cumulative frequency histogram in real-life situations. 7. Recognize linear functions and non-linear functions by using a table or a graph. 8. Compute simple probability with and without replacement. 9. Recognize patterns using explicitly defined and recursively defined linear functions. 10. Communicate real-world problems graphically, algebraically, numerically, and verbally. 11. Explain how sampling methods, bias, and phrasing of questions in data collection impact the conclusions.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the items in the January 2010 Mid-Year End-of-Course Algebra I Examination.

PART IV Item Correlation with Curriculum Framework

Released Items for Algebra I*

Strands	Content Standards
1— LANGUAGE OF ALGEBRA (LA)	1. Students will develop the language of algebra including specialized vocabulary, symbols, and operations.
2— SOLVING EQUATIONS AND INEQUALITIES (SEI)	2. Students will write, with and without appropriate technology, equivalent forms of equations, inequalities, and systems of equations, and solve with fluency.
3— LINEAR FUNCTIONS (LF)	3. Students will analyze functions by investigating rates of change, intercepts, and zeros.
4— NON-LINEAR FUNCTIONS (NLF)	4. Students will compare the properties in the family of functions.
5— DATA INTERPRETATION AND PROBABILITY (DIP)	5. Students will compare various methods of reporting data to make inferences or predictions.

Item	Strand	Content Standard	Student Learning Expectation
1	DIP	05	01
2	LA	01	09
3	LF	03	08
4	LF	03	07
5	SEI	02	01
6	DIP	05	07
7	NLF	04	01
8	LF	03	01
9	DIP	05	02
10	NLF	04	02
11	LA	01	01
12	SEI	02	07
13	NLF	04	03
14	DIP	05	10
15	SEI	02	06
16	LA	01	06
17	LA	01	04
18	LF	03	04
19	NLF	04	05
20	SEI	02	05
21	LF	03	02
22	LA	01	02
23	NLF	04	04
24	SEI	02	02
25	NLF	04	04
26	SEI	02	04
27	LF	03	03
28	LA	01	05
29	DIP	05	06
30	LF	03	09
31	DIP	05	08
32	SEI	02	08

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Algebra I items.

PART IV Item Correlation with Curriculum Framework

Non-Released Items for Algebra I*

Strands	Content Standards
1— LANGUAGE OF ALGEBRA (LA)	1. Students will develop the language of algebra including specialized vocabulary, symbols, and operations.
2— SOLVING EQUATIONS AND INEQUALITIES (SEI)	2. Students will write, with and without appropriate technology, equivalent forms of equations, inequalities, and systems of equations, and solve with fluency.
3— LINEAR FUNCTIONS (LF)	3. Students will analyze functions by investigating rates of change, intercepts, and zeros.
4— NON-LINEAR FUNCTIONS (NLF)	4. Students will compare the properties in the family of functions.
5— DATA INTERPRETATION AND PROBABILITY (DIP)	5. Students will compare various methods of reporting data to make inferences or predictions.

Item	Strand	Content Standard	Student Learning Expectation
1	LF	03	03
2	SEI	02	03
3	SEI	02	02
4	DIP	05	02
5	LA	01	03
6	NLF	04	01
7	SEI	02	08
8	LA	01	03
9	NLF	04	05
10	LF	03	02
11	SEI	02	06
12	DIP	05	09
13	NLF	04	02
14	NLF	04	02
15	NLF	04	03
16	LF	03	05
17	DIP	05	04
18	DIP	05	11
19	LF	03	06
20	LA	01	08
21	LA	01	04
22	DIP	05	05
23	DIP	05	03
24	SEI	02	01
25	LF	03	05
26	LA	01	01
27	NLF	04	04
28	LA	01	07
A	LF	03	08
B	DIP	05	03
C	NLF	04	05
D	LA	01	02
E	SEI	02	02

*Only the predominant Strand, Content Standard, and Student Learning Expectation are listed for the Algebra I items.

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