



Arkansas Comprehensive Testing, Assessment, and Accountability Program

Released Item Booklet

Algebra I

Mid-Year End-of-Course Examination

January 2008 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 2008.

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 2008 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 2008. 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 11 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 set of points represents a function?

- A. (0, 2) (1, 4) (2, 6) (0, 8)
- * B. (-2, 4) (0, 4) (2, 4) (4, 4)
- C. (4, -2) (4, 0) (4, 2) (4, 4)
- D. (-2, 2) (2, 2) (-2, -2) (2, -2)

2. What is the solution to the equation below?

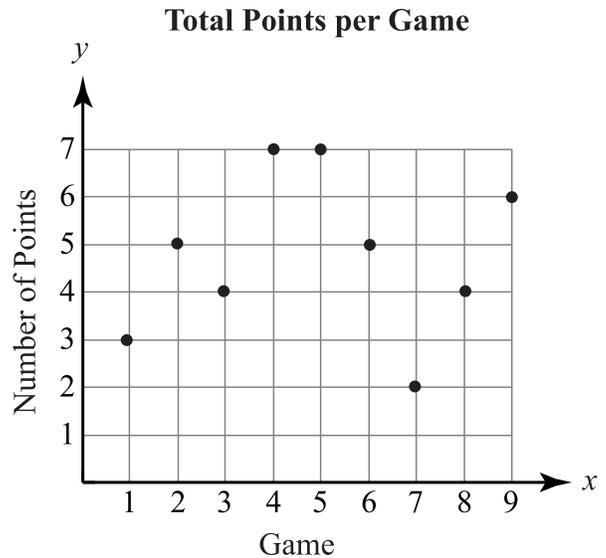
$$\frac{3}{5}x + 5 = \frac{2}{3}x + 3$$

- A. $x = -1\frac{11}{19}$
 - B. $x = 6\frac{6}{19}$
 - C. $x = -4$
 - * D. $x = 30$
3. Which formula would **not** create the sequence shown in the table below?

n	T_n
1	19
2	24
3	29
4	34

- * A. $T_n = 19 + 5n$
- B. $T_n = 14 + 5n$
- C. $T_n = 19 + 5(n - 1)$
- D. $\begin{cases} T_1 = 19 \\ T_n = T_{n-1} + 5 \end{cases}$

4. The scatterplot below shows the number of points the team scored in each of its games this season.

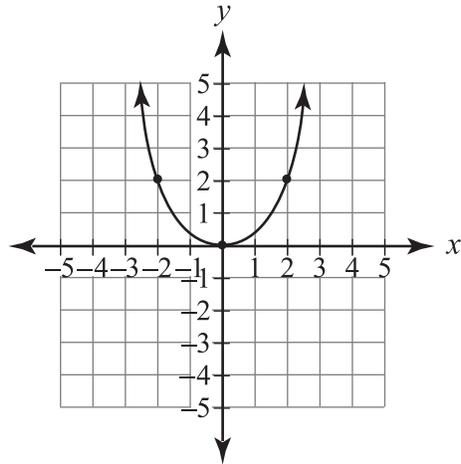


What can be inferred from the scatterplot?

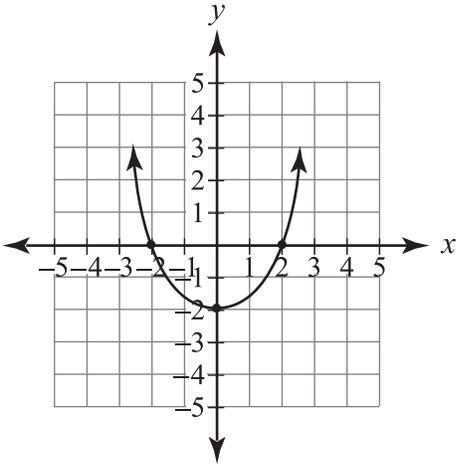
- A. The team scored fewer points against better opponents.
 - B. The team scored more points as the season progressed.
 - C. The team's highest point total was in Game 3.
 - * D. The point totals showed no correlation.
5. The function $f(x) = 2.15 + 0.15x$ describes the cost of taxicab fare, where $f(x)$ = cost of the ride (in dollars), and x = mileage. If the domain is $\{5, 10, 15, 20\}$, what is the range of the given function?
- A. $\{\$19, \$59, \$85.67, \$119\}$
 - B. $\{\$2.31, \$2.30, \$2.30, \$2.30\}$
 - * C. $\{\$2.90, \$3.65, \$4.40, \$5.15\}$
 - D. $\{\$7.30, \$12.30, \$17.30, \$22.30\}$

PART II Released Algebra I Items

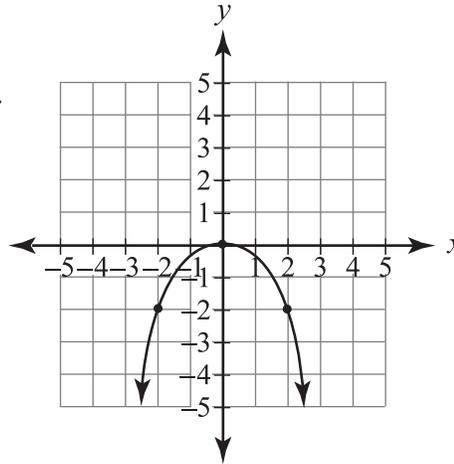
6. Which graph shows a vertical shift of the one below?



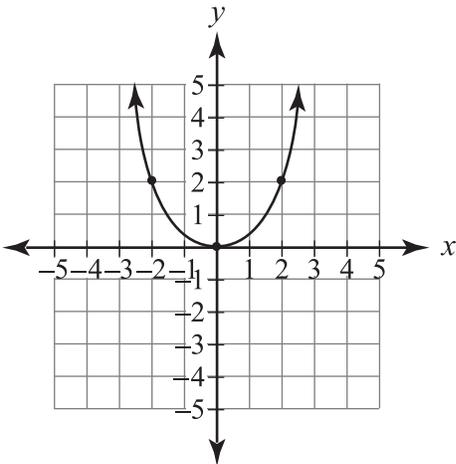
* A.



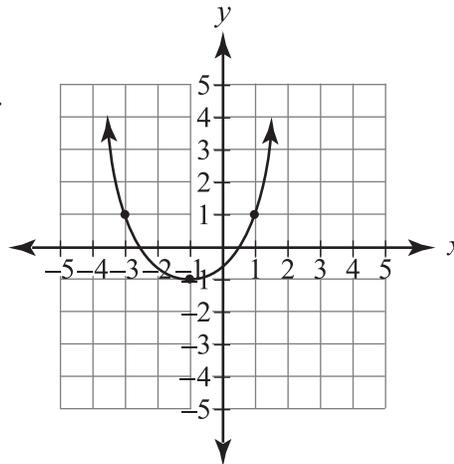
B.



C.



D.



PART II Released Algebra I Items

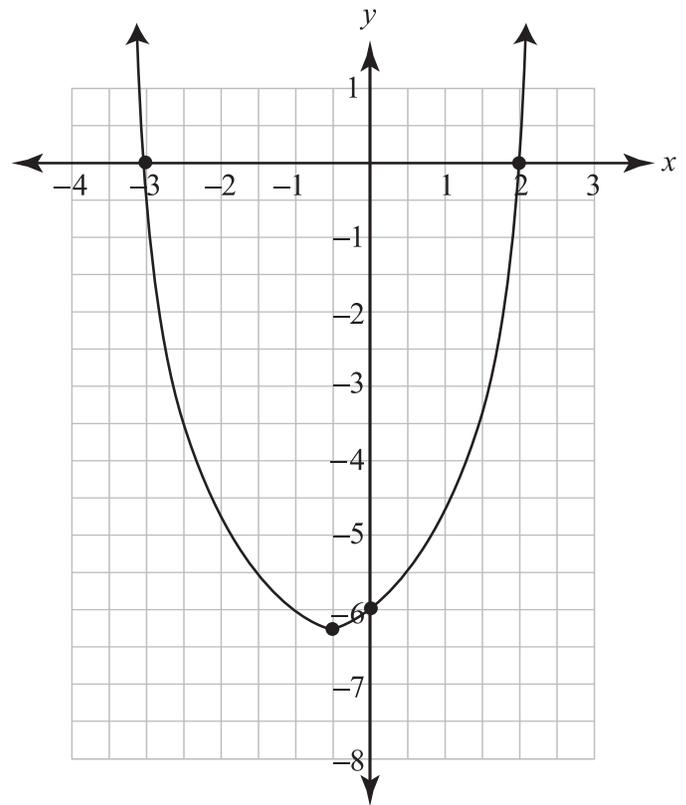
7. What is the **correct** way to factor the polynomial $8x^2 - 4x - 22$?
- A. $2(x^2 - x - 11)$
 * B. $2(4x^2 - 2x - 11)$
 C. $(8x + 11)(x - 2)$
 D. $2(4x^2 + 2x + 11)$
8. What is the slope of the line passing through points $(6, -1)$ and $(1, 8)$?
- * A. $-\frac{9}{5}$
 B. $-\frac{7}{5}$
 C. $-\frac{5}{7}$
 D. $-\frac{5}{9}$
9. Given the matrices below, what is $(2A - B)$?

$$A = \begin{bmatrix} 2 & -5 & 8 \\ 7 & 3 & -4 \end{bmatrix} \quad B = \begin{bmatrix} -9 & 8 & 3 \\ 0 & 6 & -7 \end{bmatrix}$$

- A. $\begin{bmatrix} 11 & -13 & 5 \\ 7 & -3 & 3 \end{bmatrix}$
 B. $\begin{bmatrix} 13 & -18 & 13 \\ 7 & -3 & 3 \end{bmatrix}$
 * C. $\begin{bmatrix} 13 & -18 & 13 \\ 14 & 0 & -1 \end{bmatrix}$
 D. $\begin{bmatrix} -5 & -18 & 13 \\ 14 & 0 & -15 \end{bmatrix}$

10. Sarah bought a \$450 microwave on credit from a local discount store. Interest will be \$12 per month. The equation that represents Sarah's bill is $y = 12x + 450$. What is the slope of the equation?
- A. 10
 * B. 12
 C. 450
 D. 462

11. The graph of $y = x^2 + x - 6$ is shown below.



What are the coordinates of the zero(s) of the equation?

- A. $(0, -6)$
 B. $(-0.5, -6.25)$
 * C. $(-3, 0), (2, 0)$
 D. $(-2, 0), (3, 0)$

PART II Released Algebra I Items

12. The high temperatures shown below were recorded for the first two weeks in July.

Sun.	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.
						84
86	92	89	83	84	94	93
95	95	84	84	85	89	

If the next four temperatures are 95, 95, 98, and 101, how will this change the mean and median of the data already in the table?

- * A. The mean and median will increase.
- B. The mean and median will decrease.
- C. The mean will increase and the median will decrease.
- D. The median will increase and the mean will decrease.

13. If $f(x) = 4x - 2$ and $g(x) = x^2 + 3$, what is the value of $f(4) + g(3)$?

- A. 23
- * B. 26
- C. 54
- D. 97

14. A car's efficiency, in mpg, is represented by the expression $-0.03s^2 + 2.1s + 7$, where s is the speed of the car. If the car is traveling at a speed of 60 mph, what is the car's efficiency?

- A. 7 mpg
- * B. 25 mpg
- C. 131 mpg
- D. 135 mpg

15. Which is the complete factorization of the polynomial $x^2 + 2x - 24$?

- * A. $(x + 6)(x - 4)$
- B. $(x - 6)(x + 4)$
- C. $(x + 12)(x - 2)$
- D. not factorable

16. Solve the formula below for t .

$$d = rt$$

- A. $t = d - r$
- B. $t = rd$
- C. $t = \frac{r}{d}$
- * D. $t = \frac{d}{r}$

PART II Released Algebra I Items

17. Which ordered pair is a solution to the system below?

$$\begin{cases} 3x + 2y = 2 \\ 4x + 4y = 8 \end{cases}$$

- A. $(-5, 7)$
 B. $(-4, 7)$
 * C. $(-2, 4)$
 D. $(4, -2)$

18. What value of y would cause the expression below to be undefined?

$$\frac{5x}{3y-12}$$

- A. $y = \frac{3}{12}$
 B. $y = \sqrt{3}$
 * C. $y = 4$
 D. $y = 3$

19. What is the product of the expression below?

$$(2x^2 - 11x + 5)(3x - 4)$$

- * A. $6x^3 - 41x^2 + 59x - 20$
 B. $6x^3 - 25x^2 - 29x + 35$
 C. $-2x^2 + 11x - 35$
 D. $2x^2 - 8x - 1$

20. Completely factor the expression below.

$$16x^2 - 9$$

- A. $16(x + 3)(x - 3)$
 B. $(4x + 3)(4x + 3)$
 * C. $(4x - 3)(4x + 3)$
 D. $16(x^2 - 9)$

21. Which shows all of the solution(s) to the equation below?

$$|x| - 6 = -3$$

- A. $x = 3$
 B. $-x = 3$
 C. $x = -3$
 * D. $x = -3, x = 3$

22. Simplify $\sqrt{\frac{125}{36}}$ completely.

- * A. $\frac{5\sqrt{5}}{6}$
 B. $\frac{\sqrt{125}}{6}$
 C. $\frac{\sqrt{4,500}}{36}$
 D. cannot be simplified

PART II Released Algebra I Items

23. Below are matrices showing the final wins and losses for the Young Sprouts Baseball League for the 2003 and 2004 seasons.

	2003			2004	
	W	L		W	L
Aces	6	6	Aces	4	8
Juniors	2	10	Juniors	7	5
Short Stops	7	5	Short Stops	9	3
Sluggers	9	3	Sluggers	4	8

Which matrix shows the 2004 wins and losses minus the 2003 wins and losses?

<p>* A.</p> <table style="margin-left: 40px;"> <thead> <tr> <th></th> <th style="text-align: center;">W</th> <th style="text-align: center;">L</th> </tr> </thead> <tbody> <tr> <td style="padding-right: 10px;">Aces</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-2</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">2</td> </tr> <tr> <td style="padding-right: 10px;">Juniors</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">5</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-5</td> </tr> <tr> <td style="padding-right: 10px;">Short Stops</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">2</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-2</td> </tr> <tr> <td style="padding-right: 10px;">Sluggers</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-5</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">5</td> </tr> </tbody> </table>		W	L	Aces	-2	2	Juniors	5	-5	Short Stops	2	-2	Sluggers	-5	5	<p>B.</p> <table style="margin-left: 40px;"> <thead> <tr> <th></th> <th style="text-align: center;">W</th> <th style="text-align: center;">L</th> </tr> </thead> <tbody> <tr> <td style="padding-right: 10px;">Aces</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">2</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-2</td> </tr> <tr> <td style="padding-right: 10px;">Juniors</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-5</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">5</td> </tr> <tr> <td style="padding-right: 10px;">Short Stops</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-2</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">2</td> </tr> <tr> <td style="padding-right: 10px;">Sluggers</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">5</td> <td style="border-left: 1px solid black; padding-left: 5px; text-align: center;">-5</td> </tr> </tbody> </table>		W	L	Aces	2	-2	Juniors	-5	5	Short Stops	-2	2	Sluggers	5	-5
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24. Which is the slope of a line containing the points $(-6, 20)$ and $(-1, 13)$?

- A. $\frac{7}{5}$
- B. $-\frac{5}{7}$
- C. -1
- * D. $-\frac{7}{5}$

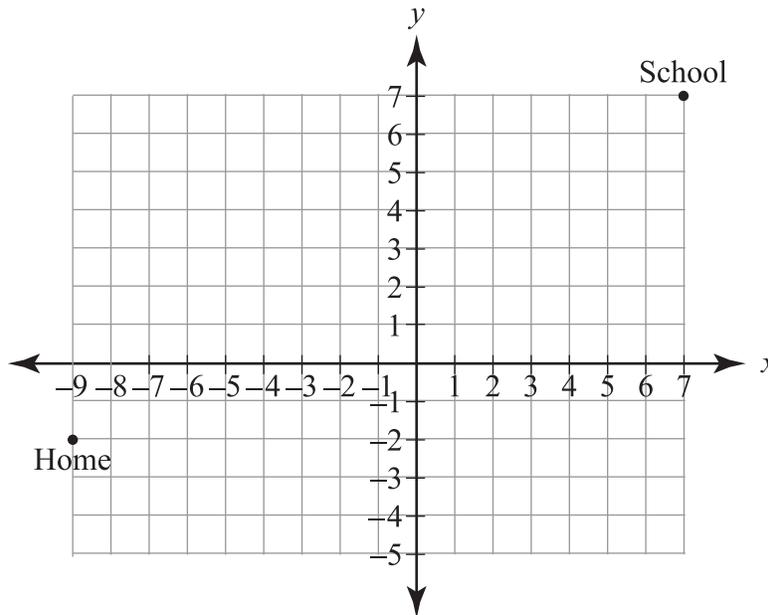
25. What would be the first operation performed when solving the algebraic expression below?

$$\frac{x^4 - 5(16 + 12)}{8}$$

- A. $x \div 8$
- B. $x - 5$
- C. $x^4 \div 8$
- * D. $(16 + 12)$

PART II Released Algebra I Items

26. If the scale of the coordinate plane below is 1 mile = 4 grid spaces, what is the distance between the house and the school, to the nearest mile?



- A. 1 mile
- B. 3 miles
- * C. 5 miles
- D. 19 miles

27. Susie's monthly cell phone rate is \$14.99 plus \$0.05 per minute. Markus spends \$19.99 per month plus \$0.02 per minute on his cell phone. This month, Markus and Susie have used the same number of minutes. Which represents their combined bills in terms of the number of minutes (m)?

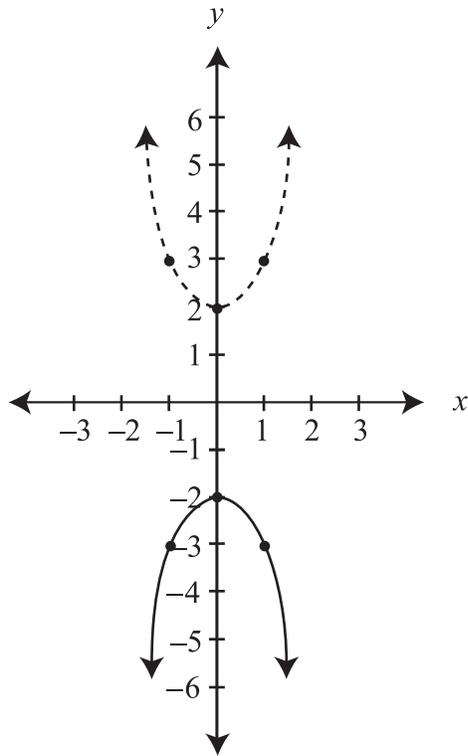
- A. $\$0.07m$
- B. $\$15.04m + \$20.01m$
- * C. $\$34.98 + 0.07m$
- D. $\$34.98 + 0.10m$

28. Line a and line b are graphed on the same coordinate grid. The slope of line a is 0 and the slope of line b is undefined. What do these two lines create?

- A. a parabola
- B. vertical lines
- * C. perpendicular lines
- D. a set of parallel lines

PART II Released Algebra I Items

29. Compare the graphs of the two functions below. The solid line is the graph of the equation $y = -x^2 - 2$.



Which equation is the graph of the dashed line?

- A. $y = -x^2 + 2$
 - * B. $y = x^2 + 2$
 - C. $y = x^2 - 2$
 - D. $y = x^2 + 4$
30. The local animal shelter houses 9 dogs to every 4 cats. If the total number of dogs and cats is 104, how many are dogs?
- A. 32
 - B. 40
 - * C. 72
 - D. 234

31. What is the value of $f(4)$ in the function $f(x) = -2x^2 - 6x$?

- A. -1
- B. -2
- C. -8
- * D. -56

32. What is the solution for x in the quadratic equation $x^2 - 14x + 49 = 0$?

- * A. $x = 7$
- B. $x = -7$
- C. $x = 49, x = 1$
- D. $x = 49, x = -14$

33. Becky is Sarah's older sister. When they go jogging together, Sarah realizes that she must take more steps than Becky to cover the same distance. Their numbers of steps are shown below.

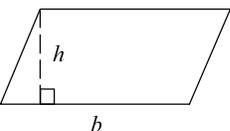
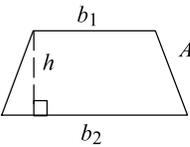
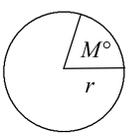
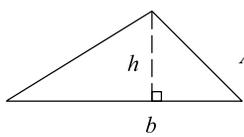
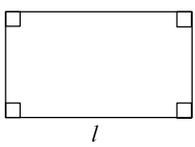
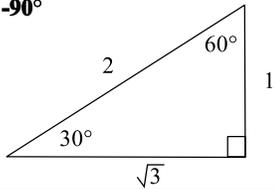
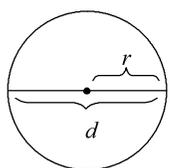
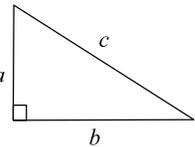
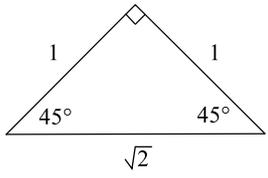
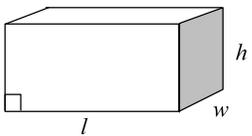
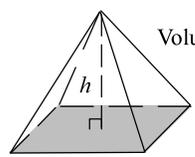
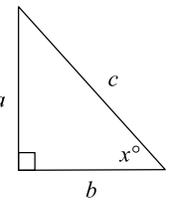
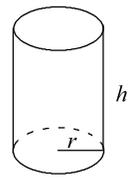
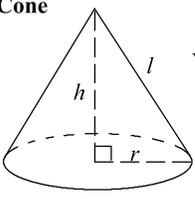
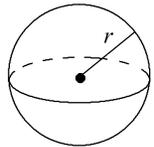
Becky	Sarah
4	7
13	25
8	15
20	39

According to the data, which describes Sarah's steps (S) as a function of Becky's steps (B)?

- A. $S = B + 3$
- B. $B = 2S - 1$
- * C. $S = 2B - 1$
- D. $S = 3B - 9$

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. 4. Solve problems involving scientific notation, including multiplication and division. 5. Perform polynomial operations (addition, subtraction, multiplication) with and without manipulatives. 7. Recognize when an expression is undefined. 8. Simplify radical expressions such as $\frac{3}{\sqrt{7}}$. 9. Add, subtract, and multiply simple radical expressions like $3\sqrt{20} + 7\sqrt{5}$ and $4\sqrt{5} \times 2\sqrt{3}$.
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 $I = prt$. 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. 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 released test items in this document.

PART III Curriculum Framework

The Arkansas Algebra I Mathematics Curriculum Framework* (continued)

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, scatterplots) to compare data sets. 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.

*The Content Standards and Student Learning Expectations listed are those that specifically relate to the released test items in this document.

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	LF	3	1
2	SEI	2	1
3	DIP	5	9
4	DIP	5	1
5	LF	3	3
6	NLF	4	4
7	NLF	4	1
8	LF	3	6
9	DIP	5	2
10	LF	3	5
11	NLF	4	2
12	DIP	5	4
13	LF	3	3
14	LA	1	1
15	NLF	4	1
16	SEI	2	3
17	SEI	2	2
18	LA	1	7
19	LA	1	5
20	NLF	4	1
21	SEI	2	4
22	LA	1	8
23	DIP	5	3
24	LF	3	6
25	LA	1	1
26	SEI	2	7
27	LA	1	2
28	LF	3	7
29	NLF	4	4
30	SEI	2	5
31	LF	3	3
32	NLF	4	3
33	DIP	5	10

*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	LA	1	1
2	DIP	5	2
3	LF	3	2
4	LA	1	1
5	SEI	2	5
6	NLF	4	4
7	LA	1	2
8	DIP	5	3
9	SEI	2	2
10	LA	1	4
11	NLF	4	5
12	DIP	5	2
13	SEI	2	3
14	LF	3	8
15	NLF	4	2
16	SEI	2	8
17	DIP	5	5
18	LF	3	5
19	DIP	5	8
20	LF	3	3
21	NLF	4	2
22	DIP	5	7
23	SEI	2	6
24	LF	3	9
25	NLF	4	5
26	SEI	2	8
27	LA	1	9
A	DIP	5	1
B	LF	3	6
C	LA	1	1
D	NLF	4	1
E	SEI	2	5

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

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