



Arkansas Comprehensive Testing, Assessment, and Accountability Program

# Released Item Booklet

## Algebra I End-of-Course Examination

April 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 spring semester participated in the *Algebra I End-of-Course Examination* in April 2008.

This Released Item Booklet for the *Algebra I End-of-Course Examination* contains test questions or items that were asked of students during the April 2008 operational administration. The test items included in Part II of this booklet are those items that contributed to the student performance results for that administration.

Students were given approximately two hours each day to complete assigned test sessions during the two days of testing in April 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 12 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 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 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 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 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 the Scoring Director 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 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 is the **correct** way to factor the polynomial  $x^2 - 16$ ?

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

2. Evaluate the algebraic expression below when  $a = 4$  and  $x = 5$ .

$$\sqrt{a} - x(3 + a^2) - 10$$

- A.  $-43$
- B.  $-67$
- \* C.  $-103$
- D.  $-253$

3. What is the solution for the two algebraic equations below?

$$\begin{cases} 3x - 2y = 25 \\ 5y = 2x - 24 \end{cases}$$

- \* A.  $(7, -2)$
- B.  $(-2, 7)$
- C.  $(17, 2)$
- D.  $(1, -11)$

4. Simplify the expression  $(-8x^3)(3x^5)$ .

- A.  $-5x^2$
- B.  $-5x^8$
- \* C.  $-24x^8$
- D.  $-24x^{15}$

5. Grace hiked 20 kilometers south and then 15 kilometers east. How far is Grace from the starting point of her hike?

- A. 14.1 km
- B. 17.5 km
- \* C. 25.0 km
- D. 35.0 km

6. What are the solutions to the quadratic equation  $x^2 - 6x + 8 = 0$ ?

- A.  $x = -2, x = -4$
- B.  $x = -2, x = 4$
- C.  $x = 2, x = -4$
- \* D.  $x = 2, x = 4$

7. The weights of 11 people in John's class are averaged to be 94 pounds. John takes out one person's weight and the average becomes 97 pounds. What weight was removed from the data set?

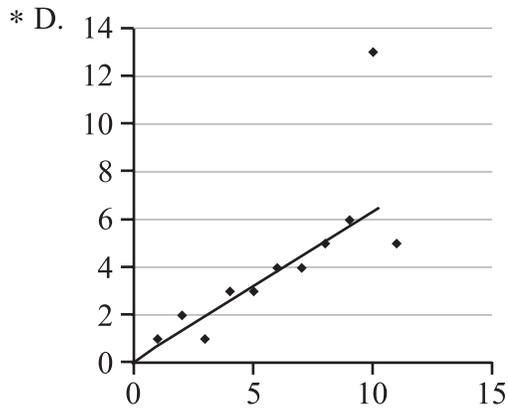
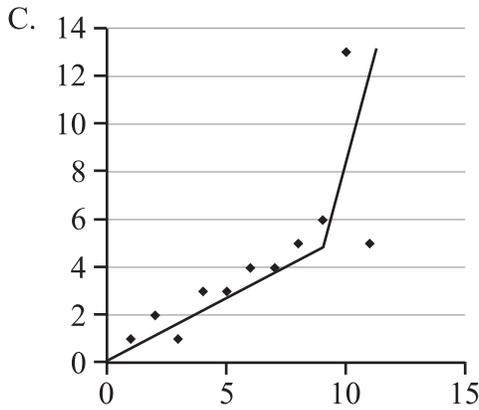
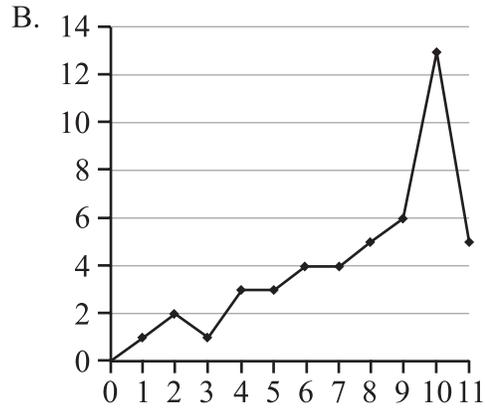
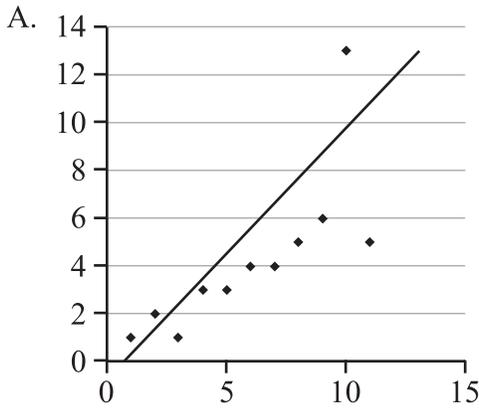
- A. 33 pounds
- \* B. 64 pounds
- C. 97 pounds
- D. 100 pounds

8. Given the function  $f(x) = 2 - 3x$ , what is  $f(-4)$ ?

- A.  $-10$
- B.  $2$
- C.  $4$
- \* D.  $14$

**PART II Released Algebra I Items**

9. Which graph **correctly** shows the line of best fit for its series of points?



10. Which line is parallel to the line with the equation  $y = -\frac{2}{3}x + 7$ ?

- A.  $y = \frac{2}{3}x + 2$
- B.  $y = \frac{3}{2}x + 6$
- \* C.  $y = -\frac{2}{3}x - 4$
- D.  $y = -\frac{3}{2}x - 1$

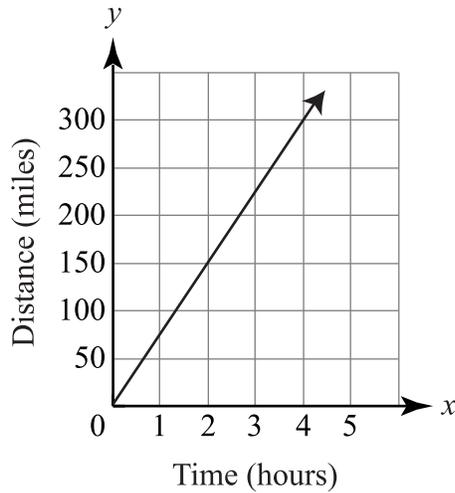
11. Solve the formula below for  $r$ .

$$I = prt$$

- \* A.  $r = \frac{I}{pt}$
- B.  $r = \frac{pt}{I}$
- C.  $r = I + pt$
- D.  $r = I - pt$

**PART II Released Algebra I Items**

12. The distance a car travels over time when traveling at a constant speed is shown on the graph below.



What is the independent variable in the function?

- \* A. time
  - B. speed
  - C. distance
  - D. amount of gas
13. What is the simplest form of the radical expression below?

$$\sqrt{\frac{27}{169}}$$

- A.  $\frac{\sqrt{27}}{13}$
- B.  $\frac{9\sqrt{3}}{13}$
- \* C.  $\frac{3\sqrt{3}}{13}$
- D.  $\frac{3\sqrt{3}}{\sqrt{169}}$

14. A batter hits a ball directly upward with an initial velocity of 96 ft per second. The equation  $h = vt - 16t^2$  represents vertical motion that is only affected by gravity. The height the ball travels is represented by  $h$ , the initial velocity of the ball is  $v$ , and  $t$  is the time. How high is the ball after 3 seconds?

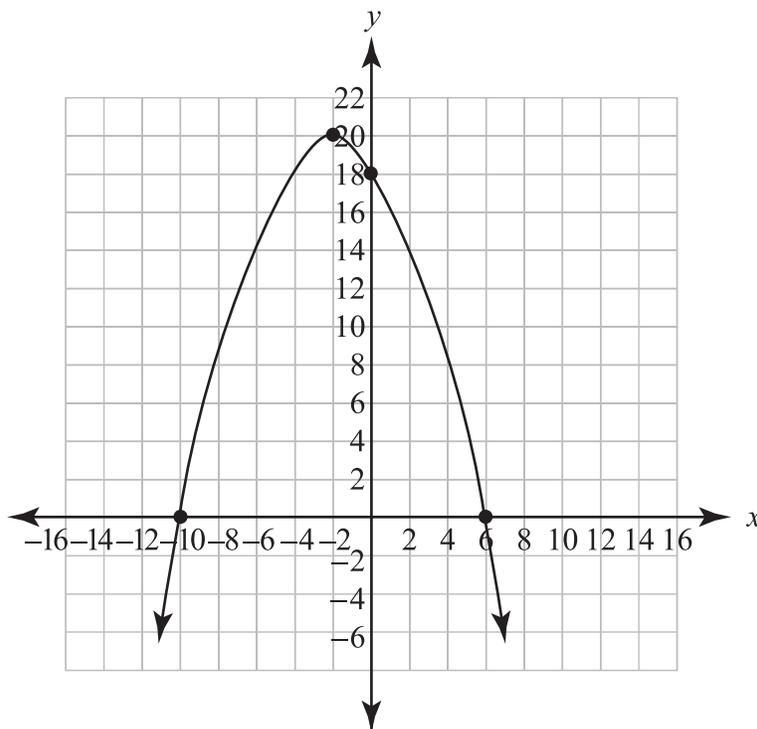
- \* A. 144 ft
- B. 240 ft
- C. 272 ft
- D. 432 ft

15. Use the laws of exponents to evaluate  $\left(\frac{1}{x}\right)^{-n}$  when  $x = 7$  and  $n = 2$ .

- A.  $\frac{1}{49}$
- B.  $\frac{1}{7}$
- C. 7
- \* D. 49

**PART II Released Algebra I Items**

16. What are the zeros of the nonlinear function graphed below?



- A.  $(-2, 20)$  and  $(0, 18)$
- B.  $(-2, 20)$  and  $(0, 0)$
- \* C.  $(-10, 0)$  and  $(6, 0)$
- D.  $(0, 0)$  and  $(0, 18)$

17. If the equation  $y = |x|$  is graphed and then moved up 3 units on the y-axis, what will be the equation of the new graph?

- \* A.  $y = |x| + 3$
- B.  $y = |x+3|$
- C.  $y = 3|x|$
- D.  $y = 3x$

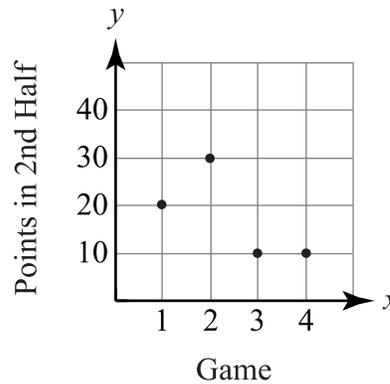
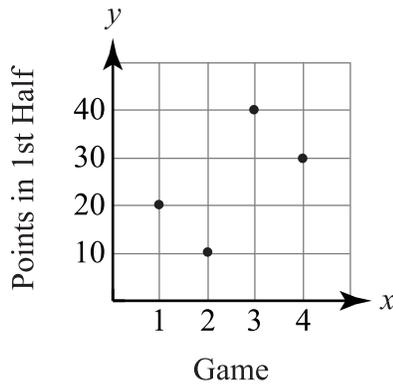
18. What is the solution, rounded to the nearest tenth, of the algebraic equation below?

$$x = (6.73 \times 10^{-9})(2.54 \times 10^8)$$

- \* A.  $x = 1.7$
- B.  $x = 170.9$
- C.  $x = 1.7 \times 10^{-17}$
- D.  $x = 17.1 \times 10^{-72}$

**PART II Released Algebra I Items**

19. Jimmy is organizing results from the basketball games this season.



Which matrix represents the graphs above?

A. 

	<b>Game</b>
	1   2
<b>Half</b>	1 $\begin{bmatrix} 20 & 20 \\ 2 & 10 & 30 \\ 3 & 40 & 10 \\ 4 & 30 & 10 \end{bmatrix}$

B. 

	<b>Game</b>
	1   2   3   4
<b>Half</b>	1 $\begin{bmatrix} 40 \\ 2 & 40 \\ 3 & 50 \\ 4 & 40 \end{bmatrix}$

C. 

	<b>Game</b>
	1   2   3   4
<b>Half</b>	1 $\begin{bmatrix} 40 & 40 & 50 & 40 \end{bmatrix}$

\* D. 

	<b>Half</b>
	1   2
<b>Game</b>	1 $\begin{bmatrix} 20 & 20 \\ 2 & 10 & 30 \\ 3 & 40 & 10 \\ 4 & 30 & 10 \end{bmatrix}$

20. What are the solutions for  $2x^2 + 11x - 6 = 0$ ?

- A.  $x = 3, -6$
- B.  $x = -3, 6$
- \* C.  $x = \frac{1}{2}, -6$
- D.  $x = -\frac{1}{2}, 6$

21. What is the value of  $5\sqrt{3} - \sqrt{75}$ ?

- \* A. 0
- B.  $10\sqrt{3}$
- C.  $-20\sqrt{3}$
- D. cannot be subtracted

**PART II Released Algebra I Items**

22. Which set of slopes would belong to a pair of lines perpendicular to one another?

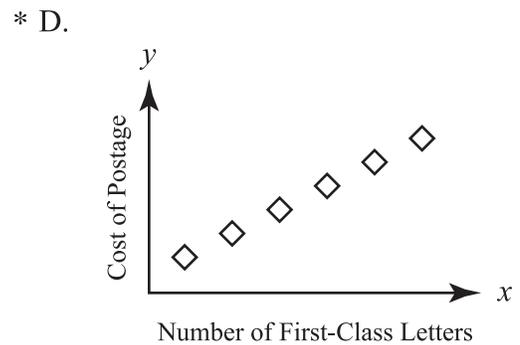
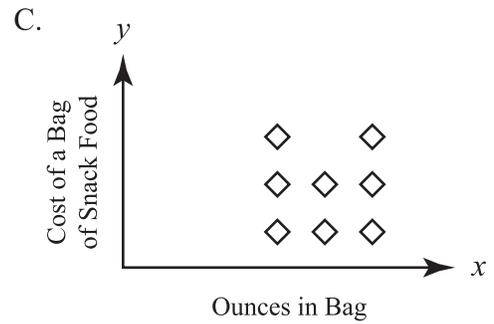
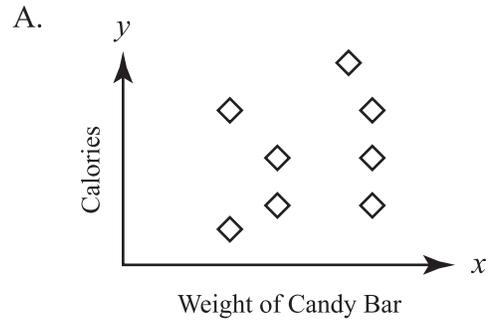
- \* A.  $m = \frac{3}{10}$  and  $m = -\frac{10}{3}$
- B.  $m = \frac{3}{10}$  and  $m = -\frac{3}{10}$
- C.  $m = \frac{3}{10}$  and  $m = \frac{3}{10}$
- D.  $m = \frac{3}{10}$  and  $m = \frac{10}{3}$

23. Based on the matrix below, what is  $\frac{1}{2}Y$ ?

$$Y = \begin{bmatrix} 7 & 8 & 10 \\ 1 & -3 & 12 \\ 22 & 8 & 4 \end{bmatrix}$$

- \* A.  $\begin{bmatrix} 3.5 & 4 & 5 \\ 0.5 & -1.5 & 6 \\ 11 & 4 & 2 \end{bmatrix}$
- B.  $\begin{bmatrix} 14 & 16 & 20 \\ 2 & -6 & 24 \\ 44 & 16 & 8 \end{bmatrix}$
- C.  $[138]$
- D.  $[34.5]$

24. Which graph represents a function?

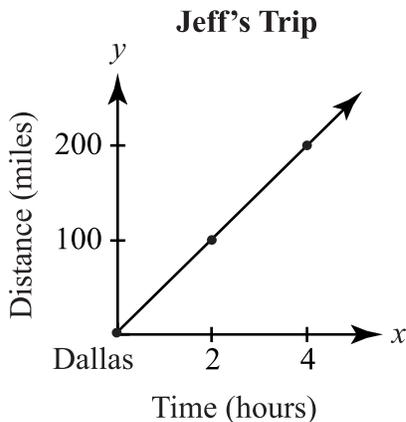


**PART II Released Algebra I Items**

25. Melissa has \$790 in savings. She wants to purchase a new computer for \$1,750. She plans to add \$20 each week to her savings. How many weeks will Melissa need to add to her savings before she can purchase the new computer?

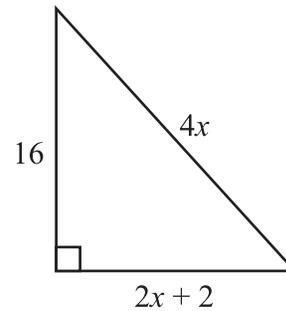
- A. 40
- \* B. 48
- C. 88
- D. 127

26. Jeff drove at a constant speed from Dallas to his home. The graph below shows his distance from Dallas as a function of time. If David drove the same route at a constant but slower speed, how would the slope of the graph of David's trip compare to the slope of the graph of Jeff's trip?



- A. The slope of David's graph would be zero.
- \* B. The slope of David's graph would be less than that of Jeff's graph.
- C. The slope of David's graph would be the same as that of Jeff's graph.
- D. The slope of David's graph would be greater than that of Jeff's graph.

Use the diagram below to answer question 27.



27. The area of the right triangle above is 96 square inches. What is the perimeter of the triangle?

- A. 5 inches
- B. 12 inches
- C. 20 inches
- \* D. 48 inches

28. Trystan painted a mural. He was paid \$150 for supplies and  $x$  dollars for every hour he worked. He finished the mural after painting 4 hours on Monday, 6 hours on Tuesday, 3 hours on Wednesday, and 2 hours on Thursday. His total pay can be described by the expression below:

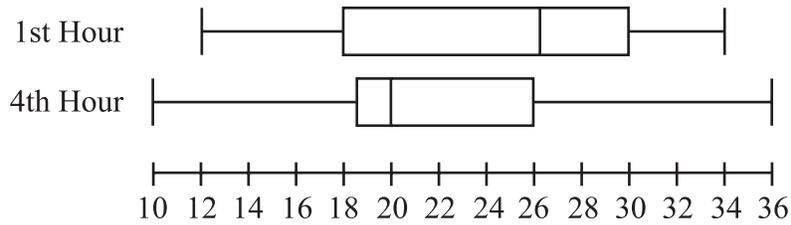
$$4x + 6x + 3x + 2x + 150$$

How can the expression be simplified?

- A.  $x = 10$
- B.  $x = -10$
- \* C.  $15x + 150$
- D.  $144x + 150$

## PART II Released Algebra I Items

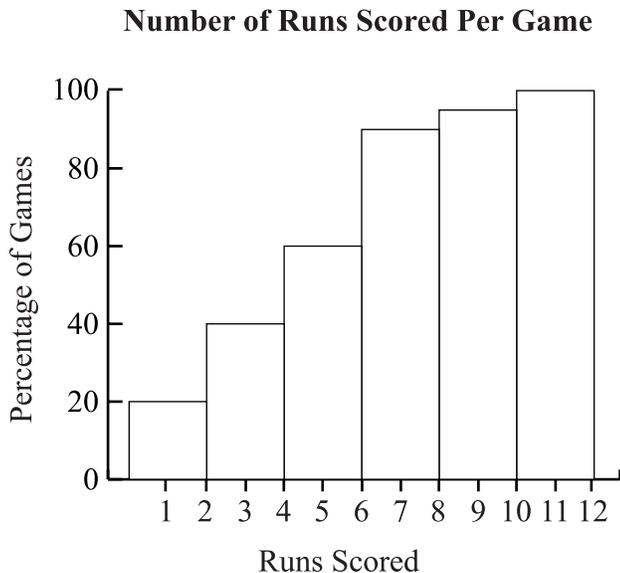
29. Below is a box-and-whisker plot that Mr. Malsom made of the tests in his 1st-hour and 4th-hour classes.



Which must be true about the scores in his classes?

- A. The range of the 1st-hour class is larger.
- B. The mean of the 1st-hour class is higher.
- \* C. The median of the 1st-hour class is higher.
- D. The interquartile range of the 4th-hour class is larger.

30. Based on the cumulative frequency histogram below, in what percentage of games were 5 or fewer runs scored?



- A. 40%
- \* B. 60%
- C. 90%
- D. 120%

31. Charlie had a full tank of gas before he drove 400 miles. Then, Charlie stopped to refill the tank. It took 36 gallons of fuel to fill up. Based on the equation  $m \div g = \text{mpg}$ , how many miles per gallon (mpg) did the truck get?

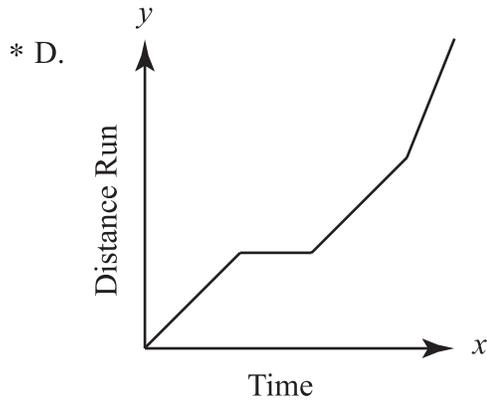
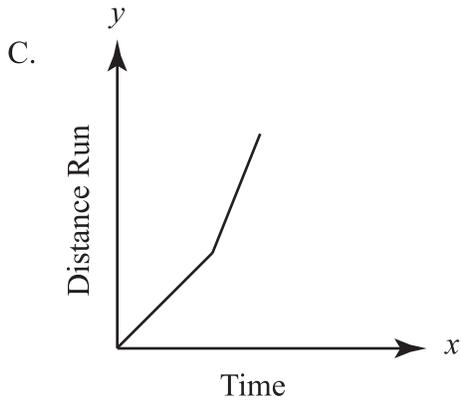
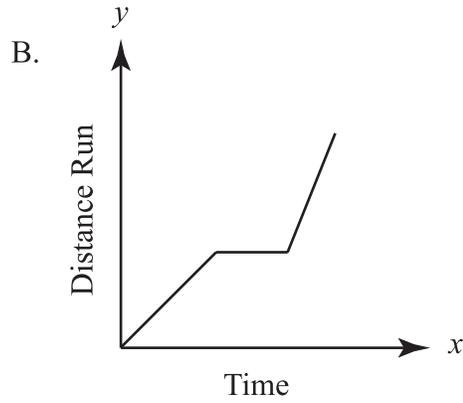
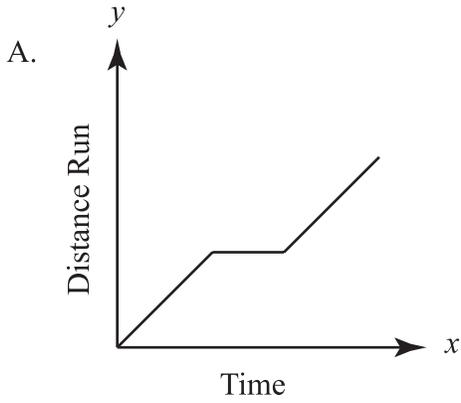
- A. 9.0
- B. 10.0
- \* C. 11.1
- D. 12.4

32. Ashley is pricing shirts using the function  $P(w) = 1.72w + 1.80$ . What price ( $P$ ) should she put on a shirt having a wholesale cost ( $w$ ) of \$6.50?

- A. \$ 2.00
- B. \$11.18
- \* C. \$12.98
- D. \$14.28

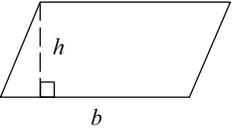
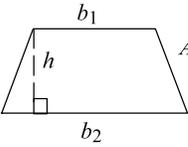
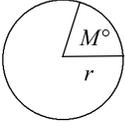
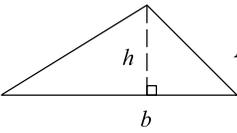
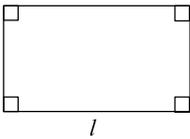
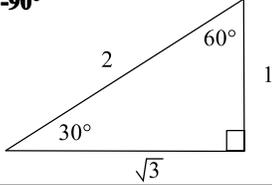
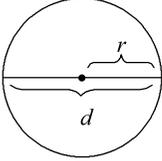
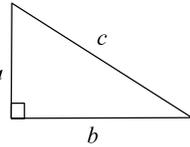
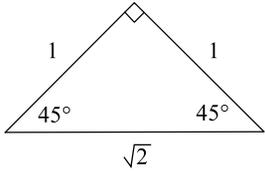
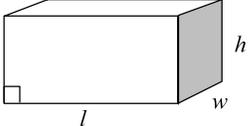
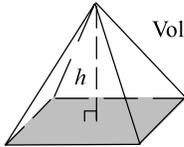
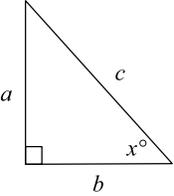
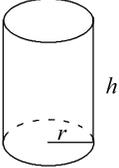
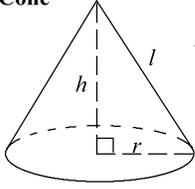
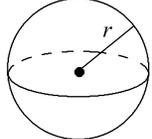
**PART II Released Algebra I Items**

33. Rodney goes for a jog. When he leaves the house, he jogs at a slow pace. Then he stops to stretch. He then restarts at the same slow pace as before. He ends his jog with a period of running at a very fast pace. Which graph shows Rodney's jog?



# PART II End-of-Course Mathematics Reference Sheet

## End-of-Course Mathematics Reference Sheet

<p><b>Parallelogram</b></p>  <p><math>P =</math> sum of all sides <math>A = bh</math></p>	<p><b>Trapezoid</b></p>  <p><math>A = \frac{h(b_1 + b_2)}{2}</math></p>	<p><b>Arc and Sector</b></p>  <p>Arc Length = <math>\left(\frac{M}{360}\right) \times 2\pi r</math> Sector area = <math>\left(\frac{M}{360}\right) \times \pi r^2</math></p>
<p><b>Triangle</b></p>  <p><math>P =</math> sum of all sides <math>A = \frac{bh}{2}</math></p>	<p><b>Rectangle</b></p>  <p><math>P = 2l + 2w</math> <math>A = lw</math></p>	<p><b>30° -60° -90°</b></p> 
<p><b>Circle</b></p>  <p><math>C = 2\pi r</math> <math>C = \pi d</math> <math>A = \pi r^2</math> <math>\pi \approx 3.14</math></p>	<p><b>Pythagorean Theorem</b></p>  <p><math>a^2 + b^2 = c^2</math></p>	<p><b>45° -45° -90°</b></p> 
<p><b>Rectangular Solid</b></p>  <p>Volume = <math>lwh</math> Surface area = <math>2lw + 2lh + 2wh</math></p>	<p><b>Pyramid</b></p>  <p><math>B =</math> area of base (shaded) Volume = <math>\frac{Bh}{3}</math></p>	<p><b>Trigonometric Ratios</b></p>  <p><math>\sin x^\circ = \frac{a}{c}</math> <math>\cos x^\circ = \frac{b}{c}</math> <math>\tan x^\circ = \frac{a}{b}</math></p>
<p><b>Cylinder</b></p>  <p>Volume = <math>\pi r^2 h</math> Surface area = <math>2\pi r h + 2\pi r^2</math></p>	<p><b>Cone</b></p>  <p><math>l =</math> slant height Volume = <math>\frac{\pi r^2 h}{3}</math> Surface area = <math>\pi r l + \pi r^2</math></p>	<p><b>Sphere</b></p>  <p>Volume = <math>\frac{4\pi r^3}{3}</math> Surface area = <math>4\pi r^2</math></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.	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. 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.	1. Solve multi-step equations and inequalities with rational coefficients <ul style="list-style-type: none"> <li>• numerically (from a table or guess and check)</li> <li>• algebraically (including the use of manipulatives)</li> <li>• graphically</li> <li>• technologically</li> </ul> 2. Solve systems of two linear equations <ul style="list-style-type: none"> <li>• numerically (from a table or guess and check)</li> <li>• algebraically (including the use of manipulatives)</li> <li>• graphically</li> <li>• technologically</li> </ul> 3. Solve linear formulas and literal equations for a specified variable. (Ex. Solve for $p$ in $l = prt$ .) 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.	1. Distinguish between functions and non-functions/relations by inspecting graphs, ordered pairs, mapping diagrams, and/or tables 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"> <li>• two points</li> <li>• the graph of a line</li> <li>• the equation of a line</li> </ul> 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"> <li>• two points</li> <li>• a point and <math>y</math>-intercept</li> <li>• <math>x</math>-intercept and <math>y</math>-intercept</li> <li>• a point and slope</li> <li>• a table of data</li> <li>• the graph of a line</li> </ul> 9. Describe the effects of parameter changes, slope, and/or $y$ -intercept, 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"> <li>1. Factoring polynomials.               <ul style="list-style-type: none"> <li>• greatest common factor</li> <li>• binomials (difference of squares)</li> <li>• trinomials</li> </ul> </li> <li>2. Determine minimum, maximum, vertex, and zeros, given the graph.</li> <li>3. Solve quadratic equations using the appropriate methods with and without technology.               <ul style="list-style-type: none"> <li>• factoring</li> <li>• quadratic formula with real-number solutions</li> </ul> </li> <li>4. Recognize function families and their connections, including vertical shift and reflection over the <math>x</math>-axis.               <ul style="list-style-type: none"> <li>• quadratics (with rational coefficients)</li> <li>• absolute value</li> <li>• exponential functions</li> </ul> </li> <li>5. Communicate real-world problems graphically, algebraically, numerically, and verbally.</li> </ol>
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"> <li>1. Construct and use scatter plots and line of best fit to make inferences in real-life situations.</li> <li>2. Use simple matrices in addition, subtraction, and scalar multiplication.</li> <li>3. Construct simple matrices for real-life situations.</li> <li>4. Determine the effects of changes in the data set on the measures of central tendency.</li> <li>5. Use two or more graphs (i.e., box-and-whisker, histograms, scatter plots) to compare data sets.</li> <li>6. Construct and interpret a cumulative frequency histogram in real-life situations.</li> <li>7. Recognize linear functions and non-linear functions by using a table or a graph.</li> <li>8. Compute simple probability with and without replacement.</li> <li>9. Recognize patterns using explicitly defined and recursively defined linear functions.</li> <li>10. Communicate real-world problems graphically, algebraically, numerically, and verbally.</li> </ol>

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

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



# ACTAAP

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**DEVELOPED FOR THE ARKANSAS DEPARTMENT OF EDUCATION, LITTLE ROCK, AR 72201**