



Arkansas Comprehensive Testing, Assessment, and Accountability Program

# Released Item Booklet

Algebra I

Mid-Year End-of-Course Examination

January 2007 Administration

---

This document is the property of the Arkansas Department of Education, and all rights of this document are reserved by the Arkansas Department of Education. Arkansas public schools may reproduce this document in full or in part for use with teachers, students, and parents. All other uses of this document are forbidden without written permission from the Arkansas Department of Education. All inquiries should be sent to Dr. Gayle Potter at the Arkansas Department of Education, 501-682-4558.

**Arkansas Department of Education**

**PART II Released Algebra I Items**

1. An integer between 1 and 30, all inclusive, is selected at random. What is the probability that the integer selected is a multiple of 5?

- A. 0.033
- B. 0.167
- \* C. 0.20
- D. 0.25

2. The expression  $20 + 1.25p$  represents the total cost of buying one extra-large pizza for \$20.00 and drinks for \$1.25 per person ( $p$ ). What is the range, in dollars, for the total cost for up to 4 people, depending on the number of drinks purchased?

- A. {0, 1, 2, 3, 4}
- B. {0, 20, 40, 60, 80}
- C. {0, 21.25, 42.50, 63.75, 85.00}
- \* D. {20.00, 21.25, 22.50, 23.75, 25.00}

3. What is the value of the expression below when  $r = 4$  and  $t = 6$ ?

$$4r + \frac{3t}{6}$$

- A. 18
- \* B. 19
- C. 26
- D. 50

4. What is the complete factorization of the polynomial below?

$$15n^2 + 10n$$

- \* A.  $5n(3n + 2)$
- B.  $5(3n^2 + 2n)$
- C.  $10n(5n + 1)$
- D.  $5n(10n + 5)$

5. What is the value of  $n$  in the equation below?

$$\frac{1}{4}(n - 8) = \frac{1}{2}n + 2$$

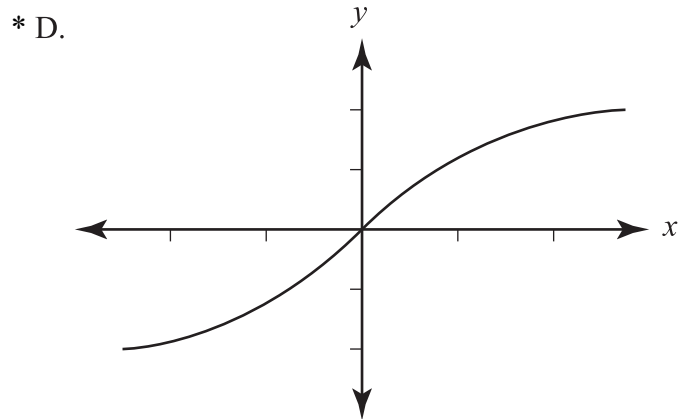
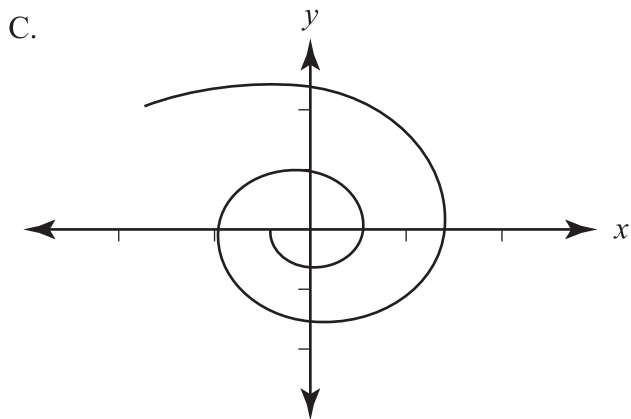
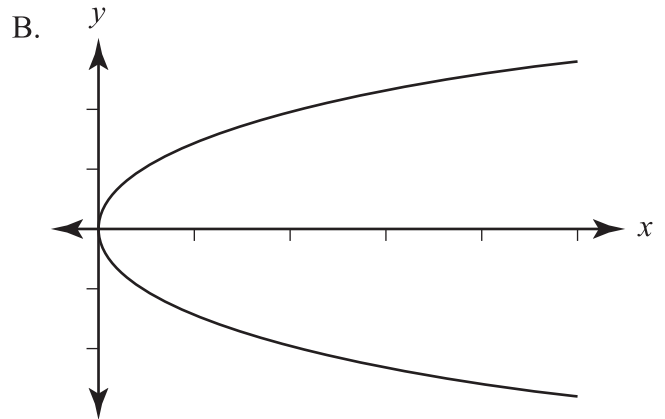
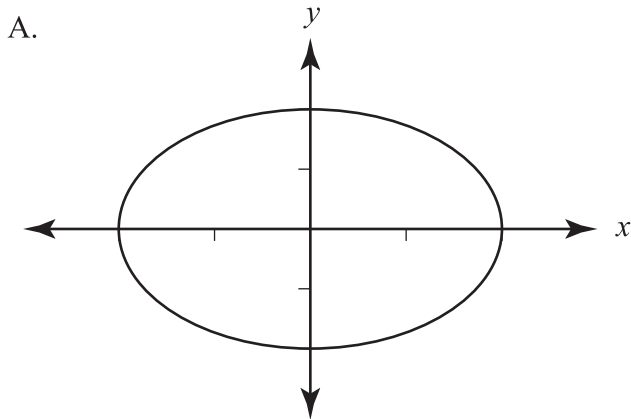
- A.  $n = -40$
- \* B.  $n = -16$
- C.  $n = -12$
- D.  $n = -1$

6. Ben's favorite pastime is bowling. Last season he had an average score of 159. In his first 2 games this season, he scored 138 and 143. What must his score be in game 3 to have an average of 159?

- A. 200
- \* B. 196
- C. 159
- D. 122

**PART II Released Algebra I Items**

7. Which graph shows a function?



8. At the beginning of a football game, a coin was tossed into the air and allowed to land on the ground. The height of the coin ( $h$ ), in feet, depends on the number of seconds the coin is in the air ( $t$ ). This situation is represented by the equation  $h = 6 + 29t - 16t^2$ . The coin was in the air for 1.5 seconds. How high was the coin tossed?

- A. 1.5 feet
- \* B. 13.5 feet
- C. 16.5 feet
- D. 25.5 feet

9. Which statement is the written translation for the equation  $6x + 36 = 84$ ?

- A. The sum of a number and 36 is 84.
- \* B. The sum of 36 and 6 times a number is 84.
- C. The sum of a number and 6, increased by 36, is 84.
- D. The sum of a number divided by 6 and 36 is 84.

**PART II Released Algebra I Items**

10. What is the solution to the system of equations below?

$$\begin{aligned} 2x + 3y &= -4 \\ 2 - 4x &= y \end{aligned}$$

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

11. Which matrix represents  $3A$ , given the matrix below?

$$A = \begin{bmatrix} 7 & 5 & 1 \\ 2 & 8 & 9 \end{bmatrix}$$

- A.  $\begin{bmatrix} 3 & 3 & 3 \\ 3 & 3 & 3 \end{bmatrix}$
- B.  $\begin{bmatrix} 10 & 8 & 4 \\ 5 & 11 & 12 \end{bmatrix}$
- C.  $\begin{bmatrix} 3 & 7 & 5 & 1 \\ 3 & 2 & 8 & 9 \end{bmatrix}$
- \* D.  $\begin{bmatrix} 21 & 15 & 3 \\ 6 & 24 & 27 \end{bmatrix}$

12. What is the slope of the line represented by the equation  $y = -2x + 3$ ?

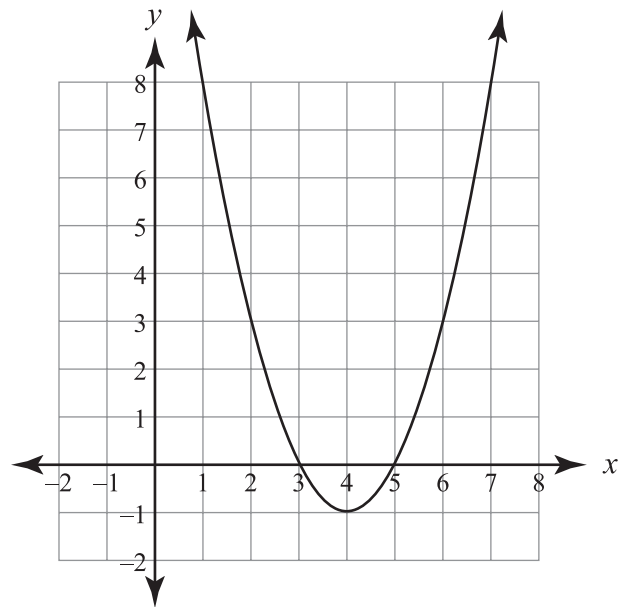
- \* A. -2
- B.  $-\frac{3}{2}$
- C. 2
- D. 3

13. Michelle met a new friend who asked her how old she was. Instead of telling her age, Michelle said, "The product of 7 and the difference of my age and 11 is 5 less than my age."

Which equation can be used to find Michelle's age?

- A.  $7x - 11 = x - 5$
- B.  $7x - 11 = 5 - x$
- C.  $7(x - 11) = 5 - x$
- \* D.  $7(x - 11) = x - 5$

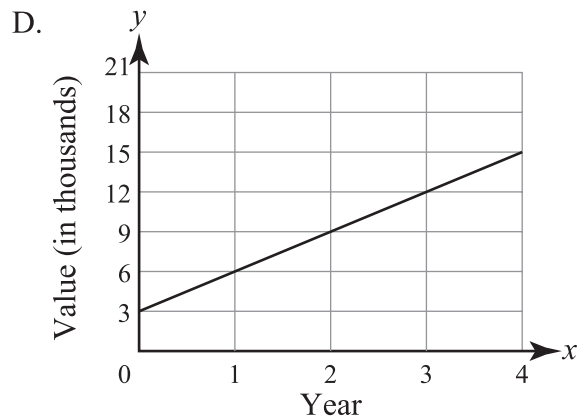
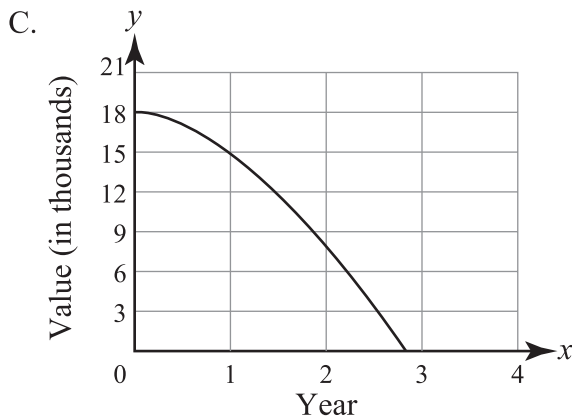
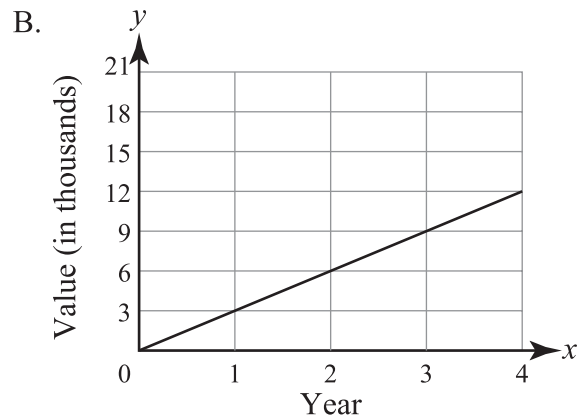
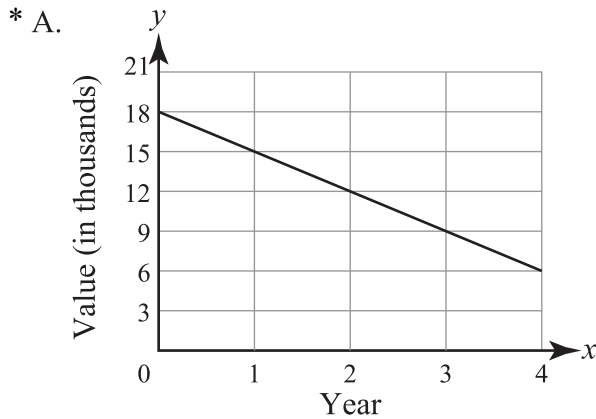
14. What is the vertex of the quadratic function  $y = x^2 - 8x + 15$ , as shown on the graph below?



- \* A. (4, -1)
- B. (-1, 4)
- C. (5, 0)
- D. (3, 0)

**PART II Released Algebra I Items**

15. The value of a car is \$18,000 when new, and its value decreases \$3,000 per year. Which graph shows the value of the car for the first 4 years?



16. In one school, 36 eighth-grade students scored at the proficient level on the state literacy test. This number represents 45% of the class. How many students in this school are in the eighth grade?

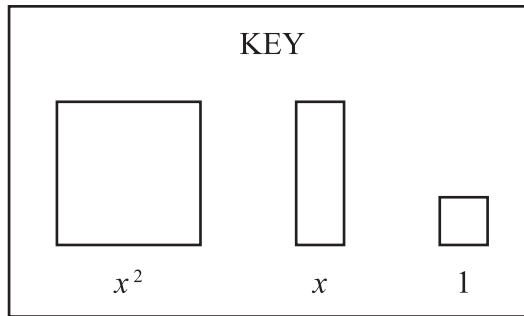
- A. 17  
 B. 72  
 \* C. 80  
 D. 1,620

17. In a school auditorium, each row has 2 more seats than the previous row. If the first row has 8 seats, how many seats will the first 10 rows have altogether?

- A. 26  
 B. 80  
 C. 125  
 \* D. 170

**PART II Released Algebra I Items**

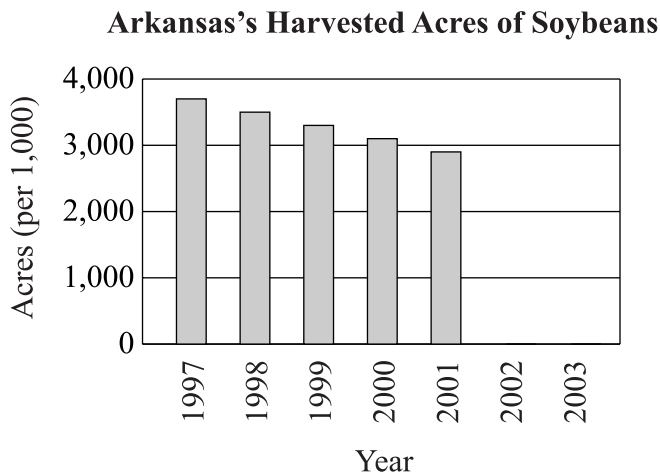
18. The polynomial  $x^2 + 3x + 2$  is modeled below using algebra tiles.



Which two binomials multiply to produce  $x^2 + 3x + 2$ ?

- A.  $(x^2 + 2x)(x + 2)$
- B.  $(2x + 1)(x + 1)$
- C.  $(x + 2)(x + 2)$
- \* D.  $(x + 2)(x + 1)$

19. The bar graph below shows Arkansas's harvested acres of soybeans from 1997–2003.



Based on the bar graph, what were the estimated harvested acres, per 1,000, for the state of Arkansas in the year 2003?

- A. 2,000
- \* B. 2,500
- C. 2,800
- D. 3,300

20. Which ordered pair is a solution to the system of equations given below?

$$\begin{aligned} x + y &= 10 \\ x - y &= 2 \end{aligned}$$

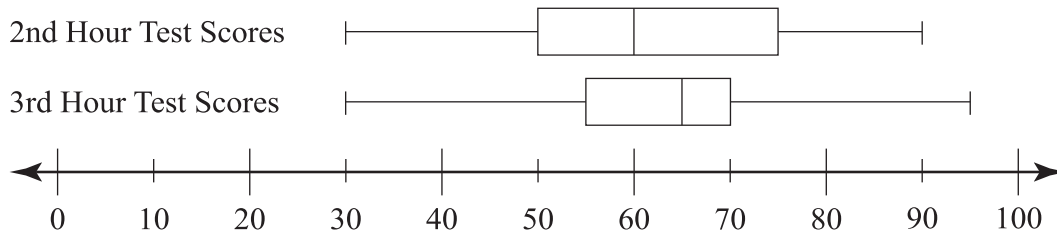
- A.  $(-6, -4)$
- B.  $(-4, -6)$
- C.  $(4, 6)$
- \* D.  $(6, 4)$

21. What is the value of  $(\sqrt{(4x)})^2$  if  $x = 4$ ?

- A. 4
- B. 8
- \* C. 16
- D. 64

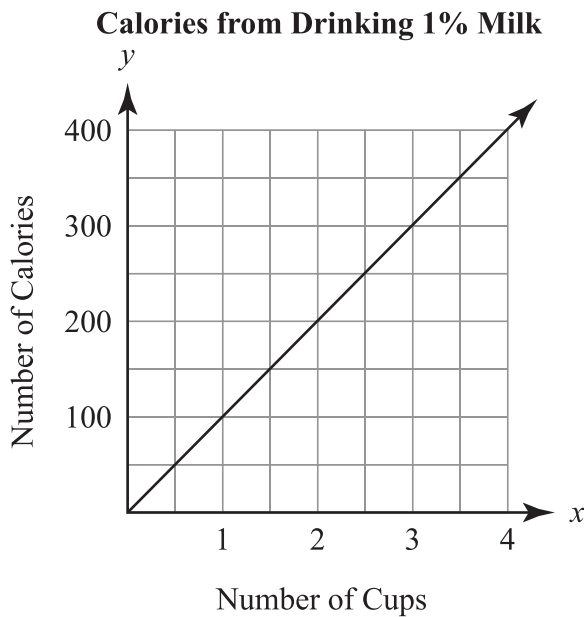
**PART II Released Algebra I Items**

22. Based on the box-and-whisker plot below, which statement is true?



- A. The 2nd hour's range is greater than the 3rd hour's range.
- \* B. The 3rd hour's median score is greater than the 2nd hour's median score.
- C. The 3rd hour's minimum score is greater than the 2nd hour's minimum score.
- D. The 2nd hour's maximum score is greater than the 3rd hour's maximum score.

23. What is the independent variable on the line graph shown below?



- \* A. the number of cups
- B. the type of milk (1%)
- C. the number of calories
- D. the calories from drinking 1% milk

24. Which classification of the pair of lines below is **correct**?

$$y = -2x + 5 \qquad y = -2x + 1$$

- A. skew lines
- \* B. parallel lines
- C. intersecting lines
- D. perpendicular lines

25. What are the solutions for  $x^2 - 10x + 24 = 0$ ?

- \* A.  $x = 4, 6$
- B.  $x = 8, 3$
- C.  $x = 12, 2$
- D.  $x = 10, -24$

**PART II Released Algebra I Items**

26. An atom is about two millionths of an inch in diameter. How is two millionths written in scientific notation?

- \* A.  $2 \times 10^{-6}$
- B.  $2 \times 10^{-5}$
- C.  $2 \times 10^5$
- D.  $2 \times 10^6$

27. How many solutions does the equation below have?

$$|k| = 7$$

- A. 0
- B. 1
- \* C. 2
- D. 3

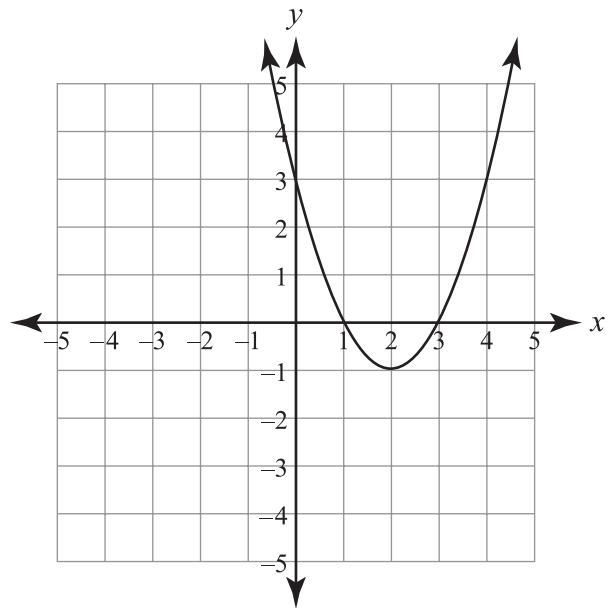
28. Dexter has a bag that contains 10 blue marbles, 10 green marbles, and 5 yellow marbles. He randomly chooses a marble, which is blue. Without putting the blue marble back, Dexter would like for the next marble that he chooses to be yellow. What is the probability that the next marble he randomly chooses will be yellow?

- A.  $\frac{4}{25}$
- B.  $\frac{4}{24}$
- C.  $\frac{5}{25}$
- \* D.  $\frac{5}{24}$

29. What is the equation for a line that passes through points  $(-2, 5)$  and  $(4, 8)$ ?

- A.  $y = 2x$
- B.  $y = \frac{1}{2}x$
- \* C.  $y = \frac{1}{2}x + 6$
- D.  $y = -\frac{1}{2}x + 10$

30. The quadratic function  $y = x^2 - 4x + 3$  is graphed below.



What is the vertex of this equation?

- A.  $(0, 3)$
- B.  $(1, 0)$
- C.  $(3, 0)$
- \* D.  $(2, -1)$



## PART II Released Algebra I Items

31. An outdoor furniture store recorded the items below in stock at the start of a business day, where P = picnic tables, B = barbecue grills, F = fountains, and L = lounge chairs.

$$\begin{array}{cccc} \text{P} & \text{B} & \text{F} & \text{L} \\ \left[ \begin{array}{cccc} 8 & 2 & 1 & 4 \end{array} \right] \end{array}$$

After the store opened, additional items were delivered. The number of additional items delivered are shown in the matrix below.

$$\begin{array}{cccc} \text{P} & \text{B} & \text{F} & \text{L} \\ \left[ \begin{array}{cccc} 2 & 10 & 3 & 0 \end{array} \right] \end{array}$$

During the business day, 2 barbecue grills and 1 lounge chair were sold. Which matrix **correctly** represents how many of each item the store has left in stock at the close of the business day?

A. 
$$\begin{array}{cccc} \text{P} & \text{B} & \text{F} & \text{L} \\ \left[ \begin{array}{cccc} 10 & 12 & 4 & 4 \end{array} \right] \end{array}$$

B. 
$$\begin{array}{cccc} \text{P} & \text{B} & \text{F} & \text{L} \\ \left[ \begin{array}{cccc} 8 & 10 & 4 & 3 \end{array} \right] \end{array}$$

C. 
$$\begin{array}{cccc} \text{P} & \text{B} & \text{F} & \text{L} \\ \left[ \begin{array}{cccc} 10 & 10 & 4 & 4 \end{array} \right] \end{array}$$

\* D. 
$$\begin{array}{cccc} \text{P} & \text{B} & \text{F} & \text{L} \\ \left[ \begin{array}{cccc} 10 & 10 & 4 & 3 \end{array} \right] \end{array}$$

32. At Scott's Bait and Tackle Shop, there is a fixed rental charge for each hour the supplies are used, as shown in the table below.

Time in Hours	Rental Cost
1	10
2	15
3	20
4	25
5	30
$x$	?

Which represents the data above using function notation?

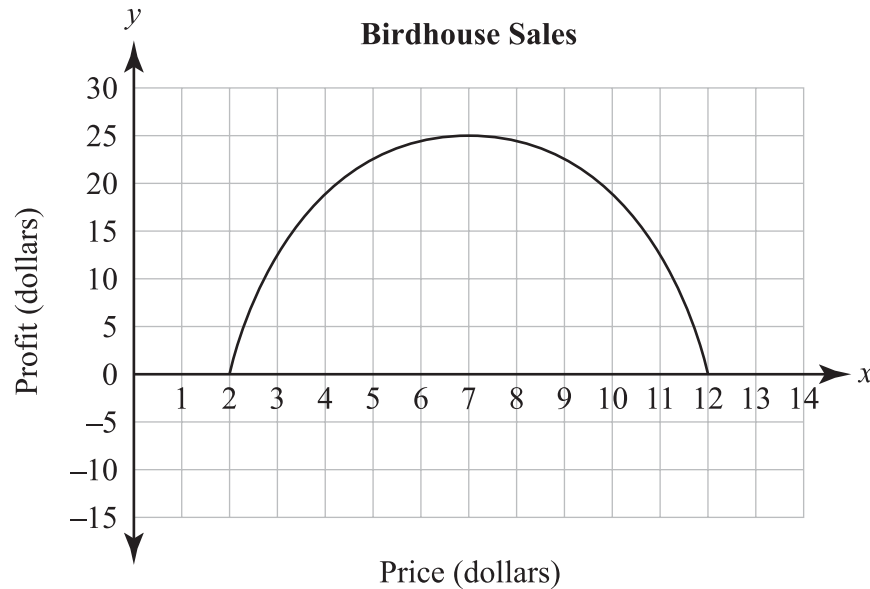
- A.  $f(x) = x + 5$   
 B.  $f(x) = 5x + 0$   
 \* C.  $f(x) = 5x + 5$   
 D.  $f(x) = 5x + 4$

33. Which expression is undefined for the given values of  $x$ ?

- \* A.  $\frac{x^2 + x}{x - 2}$ , when  $x = 2$   
 B.  $4x + 3$ , when  $x = 3$   
 C.  $\frac{x - 4}{x + 5}$ , when  $x = 4$   
 D.  $x^2 - 25$ , when  $x = 5$

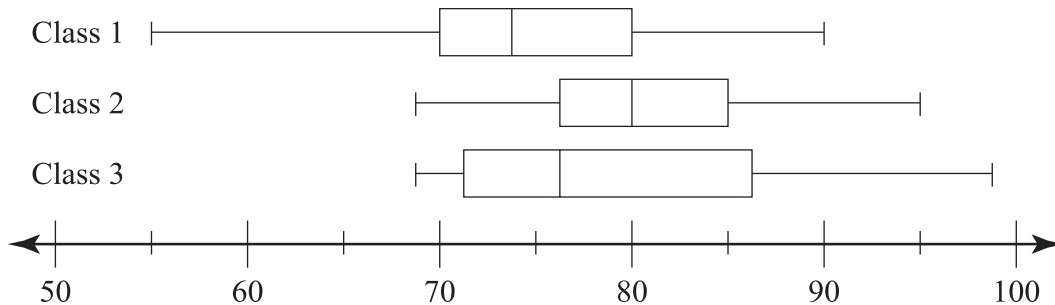
## PART II Released Algebra I Items

34. Bart buys supplies to make birdhouses. The graph below shows the profit he makes per month as a function of the price he charges for each birdhouse.



Which price is a zero of the function?

- A. \$ 7
  - \* B. \$12
  - C. \$14
  - D. \$25
- 
35. Three American Government classes took the same semester exam. Without repeating, the scores of each class are displayed in the box-and-whisker plot below.

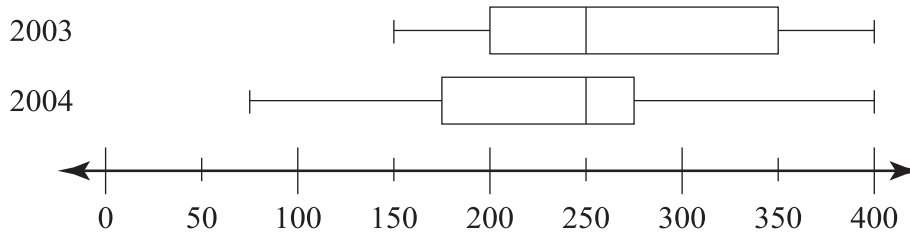


Which statement accurately describes the data?

- \* A. Class 2 has the highest median.
- B. The maximum score in Class 1 is 80.
- C. Class 3 has the greatest range of test scores.
- D. Approximately 75% of the scores in Class 1 are greater than the median score.

## PART II Released Algebra I Items

36. The box-and-whisker plot below represents the number of people who attended Coolsville Water Park each day during the summer seasons of 2003 and 2004.

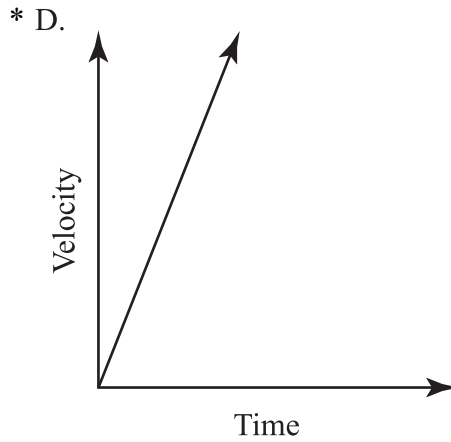
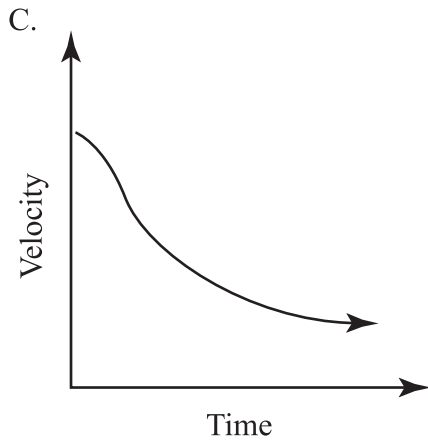
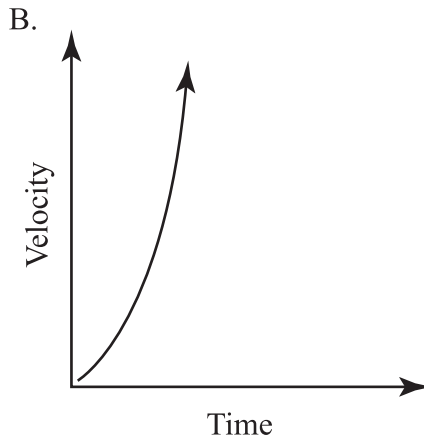
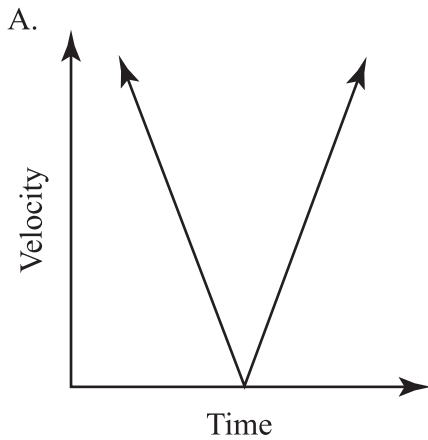


Which statement accurately describes the data?

- A. The minimum number of attendees was in 2003.
- B. The interquartile range in 2004 was greater than it was in 2003.
- C. The maximum number of attendees was greater in 2003 than it was in 2004.
- \* D. The median number of people who attended the Water Park was the same for both years.
- 
37. A school district buses 1,360 out of 4,200 students to school. Rounded to the nearest tenth, what percentage of the student population is bused to school?
- \* A. 32.4%
- B. 33.0%
- C. 33.7%
- D. 34.0%
38. If  $x = 4$ , which expression would be considered undefined?
- A.  $\frac{x^2 - 16x + 60}{x - 6}$
- B.  $\frac{4x^2 + 21x + 20}{x + 4}$
- C.  $\frac{2x^2 + 7x + 30}{x - (-4)}$
- \* D.  $\frac{3x^2 - 22x + 40}{x - 4}$
39. What is the slope of the line on the coordinate graph shown below?
- 
- A. -2
- \* B.  $-\frac{1}{2}$
- C.  $\frac{1}{2}$
- D. 2

**PART II Released Algebra I Items**

40. Which graph demonstrates a linear relationship between velocity and time?



41. Which linear equation fits a line that goes through the two points below?

(1, 5)    (-1, -1)

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

42. If  $y$  increases proportionally with  $x$ , and  $y = 15$  when  $x = 24$ , what is the value of  $x$  when  $y = 25$ ?

- A. 14.4
- B. 15.6
- \* C. 40
- D. 45

**PART II Released Algebra I Items**

43. Factor the expression below.

$$x^2 + 12x + 36$$

- A.  $(x + 9)(x + 4)$
- B.  $(x - 9)(x - 4)$
- C.  $(x + 6)(x - 6)$
- \* D.  $(x + 6)(x + 6)$

44. Mrs. Douglas asked her students to write an algebraic expression for the phrase “6 more than twice a number.” Which expression is **correct**?

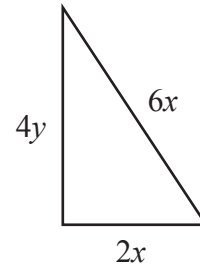
- A.  $\frac{n}{2} + 6$
- \* B.  $2n + 6$
- C.  $6n + 2$
- D.  $n + 12$

45. It is 220 miles from Little Rock, Arkansas, to Gentry, Arkansas. Tyra’s car averages 25.3 miles per gallon. What is the minimum whole number of gallons of gas Tyra will need to drive from Little Rock to Gentry?

- A. 8
- \* B. 9
- C. 11
- D. 12

46. To find the perimeter of the triangle below, Jack added the lengths of the sides.

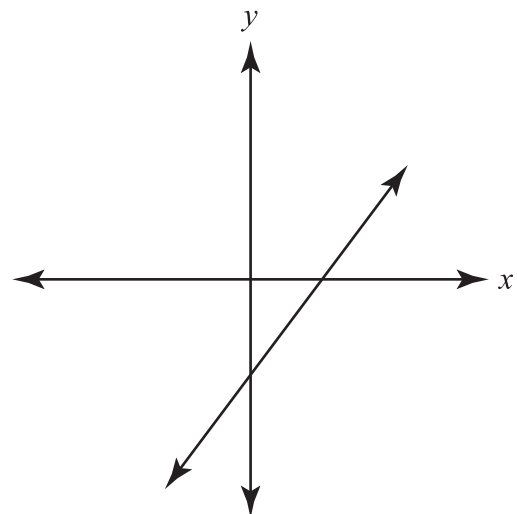
$$\text{Perimeter} = 6x + 4y + 2x$$



Which expression gives the sum in its simplest form?

- A.  $3x + 2y + x$
- B.  $12x^2 + 4y$
- \* C.  $8x + 4y$
- D.  $12xy$

47. What type of function is shown on the graph below?



- A. absolute value
- B. exponential
- C. quadratic
- \* D. linear

**PART II Released Algebra I Items**

48. The formula used to determine a person's arm strength,  $s$ , is shown below.

$$s = \frac{d + p}{\frac{w}{10} + h - 60}$$

What is the arm strength of a person with the following information?

$d$  (dips on a parallel bar) = 8 dips  
 $p$  (pull-ups) = 12 pull-ups  
 $w$  (weight in pounds) = 150 pounds  
 $h$  (height in inches) = 65 inches

- \* A. 1
- B.  $\frac{20}{83}$
- C.  $\frac{1}{5}$
- D.  $\frac{1}{7}$

49. Steve recorded the number of miles he drove and the amount of gasoline he used for two months in the table below.

Number of Miles	Number of Gallons
290	12.1
242	9.8
196	8.2
237	9.5
184	7.8

To the nearest tenth, what was his average mileage per gallon of gasoline?

- A. 23.6 miles per gallon
- B. 24.0 miles per gallon
- \* C. 24.2 miles per gallon
- D. 24.7 miles per gallon

50. What is the same about the graphs of the two linear equations below?

$$y = -2x + 10$$

$$y = 2x + 10$$

- A. the slopes
- \* B. the  $y$ -intercepts
- C. the  $x$ -intercepts
- D. the ordered pairs

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

$$\frac{56p^4q}{84p^3q^2}$$

- A.  $\frac{2p}{q}$
- \* B.  $\frac{2p}{3q}$
- C.  $\frac{4p}{6q}$
- D.  $\frac{28p}{42q}$

52. The entrance to the gold mine in which John works is at an elevation of 6,845 feet above sea level. The mine is 4,370 feet deep. At what elevation is John standing when he works at the bottom of the mine?

- A. 2,475 feet below sea level
- \* B. 2,475 feet above sea level
- C. 2,575 feet above sea level
- D. 11,215 feet above sea level

**PART II Released Algebra I Items**

53. What is the midpoint of a line segment with coordinates (0, 0) and (4, 4)?

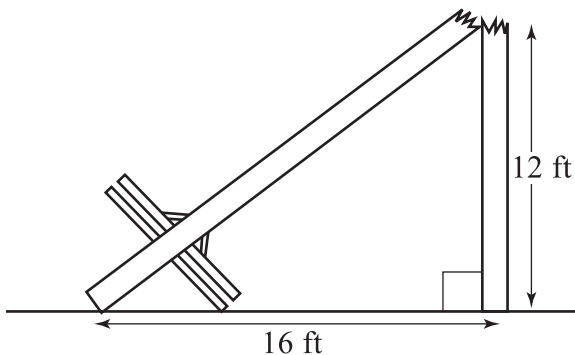
- \* A. (2, 2)
- B. (0, 4)
- C. (1, 3)
- D.  $(4\sqrt{2}, 4\sqrt{2})$

54. The equation below gives the time in seconds,  $T$ , that it takes for a pendulum  $l$  feet long to swing back and forth once. Justin has a clock with a pendulum that is 1.25 feet long. How long does it take the pendulum to swing back and forth once?

$$T = \frac{11}{7} \sqrt{\frac{l}{2}}$$

- A. 0.61 seconds
- B. 0.87 seconds
- C. 0.99 seconds
- \* D. 1.24 seconds

55. How tall was the electrical pole, shown below, before it was broken?

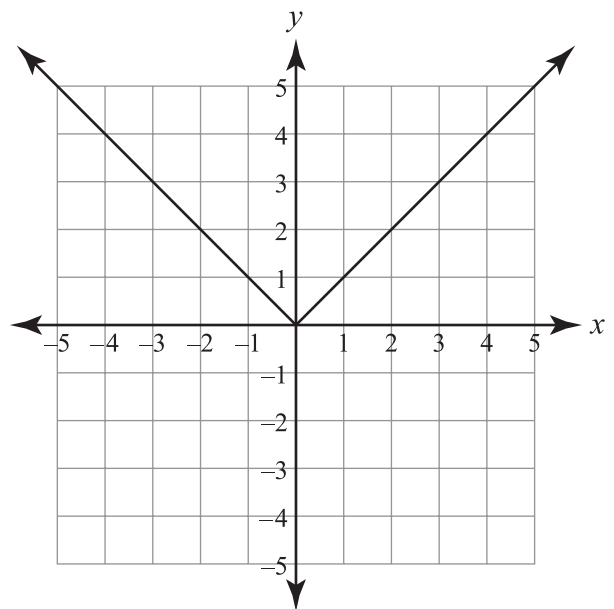


- A. 20 ft
- B. 28 ft
- \* C. 32 ft
- D. 36 ft

56. Which describes the change to the graph of  $y = 2x + b$  as  $b$  changes from 0 to 25?

- A. The new line becomes steeper.
- B. The new line becomes less steep.
- \* C. The new  $y$ -intercept moves up the  $y$ -axis.
- D. The new  $y$ -intercept moves down the  $y$ -axis.

57. The graph of  $y = |x|$  is shown below.



If the graph is reflected over the  $x$ -axis, what is the equation of the function?

- A.  $y = \frac{|x|}{2}$
- \* B.  $y = -|x|$
- C.  $y = |x| - 2$
- D.  $y = |x| + 5$

**PART II Released Algebra I Items**

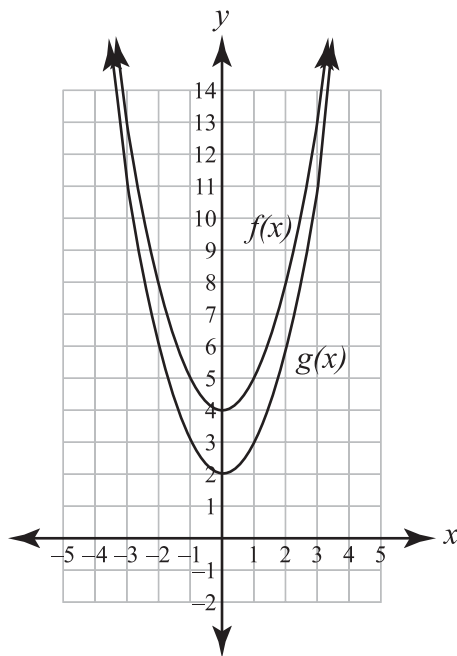
58. To find the answer to a math problem, Sid performed the steps below.

- First, he added 200 and 20.
- He took that answer and divided by 11.
- He then subtracted 4.
- Finally, he added 2.

His answer, which was correct, was 18. Which problem did he solve?

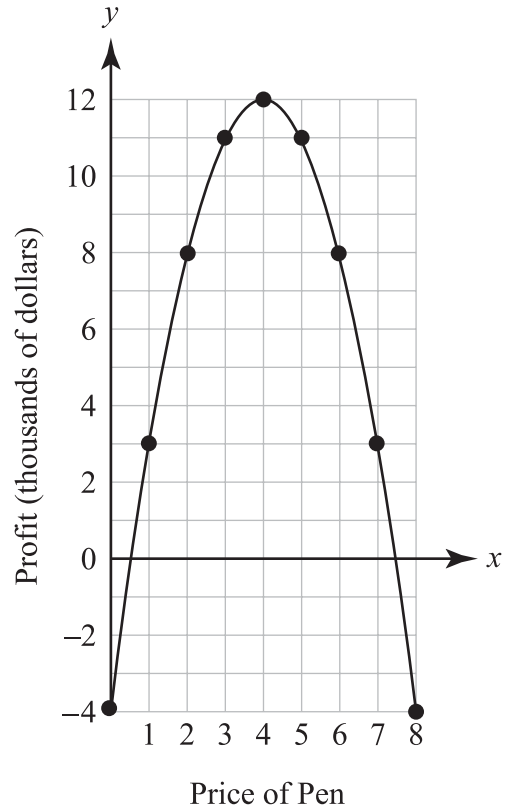
- A.  $(200 + 20) \div (11 - 4 + 2)$
- B.  $(200 + 20) \div (11 - 4) + 2$
- \* C.  $(200 + 20) \div 11 - 4 + 2$
- D.  $200 + 20 \div 11 - 4 + 2$

59. If  $f(x) = x^2 + 4$ , what is the equation for  $g(x)$ ?



- \* A.  $g(x) = x^2 + 2$
- B.  $g(x) = x^2 - 2$
- C.  $g(x) = 2 - x^2$
- D.  $g(x) = 2x^2 + 4$

60. An office supply store found that pens which sell for  $x$  dollars have a profit, in thousands of dollars, modeled by the equation  $y = -x^2 + 8x - 4$ . The graph of this equation is shown below.



What pen price results in the maximum profit for the store?

- \* A. \$ 4
- B. \$ 7
- C. \$ 8
- D. \$12



## PART II Released Algebra I Items

### MATHEMATICS OPEN-RESPONSE ITEM A

- A. The table below provides data about ticket sales, in millions of dollars, for two movies over the course of 6 weeks after their release dates.

Week	Ticket Sales for Movie A	Ticket Sales for Movie B
1	8	34
2	14.5	30
3	21	26
4	27.5	22
5	34	18
6	40.5	14

Week 0 represents the premiere weekend for each movie.

- On the grid provided in your answer document, plot and connect the points for the data for Movie A and Movie B. Be sure to label the axes, title the graph, and label the lines that correspond to each movie.
- Determine the equation for each line from Part 1. Explain what the slopes and the  $y$ -intercepts represent.
- When will both movies earn **approximately** the same amount of money in ticket sales? Explain your answer even if you use mental math or a calculator.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

### RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM A

SCORE	DESCRIPTION
4	The student earns 6 points. The response contains no incorrect work. The graph is titled in Part 1.
3	The student earns 4–5 ½ points.
2	The student earns 2–3 ½.
1	The student earns ½–1 ½ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

**PART II Released Algebra I Items**

**MATHEMATICS OPEN-RESPONSE ITEM B**

**B.** From an altitude of 6,000 feet, a hot-air balloon rises at a rate of 110 feet per minute.

1. Based on the information above, copy and complete the table below in your answer document. Show all of your work and/or explain your answer.

**Hot Air Balloon**

<b>Time (minutes)</b>	<b>Height (feet)</b>
0	
1	6,110
2	
3	6,330
4	

2. What are the slope and y-intercept of the line that represents the altitude, in feet, of the balloon as a function of time, in minutes? Show all of your work and/or explain your answer.
3. What is the height, in feet, of the balloon after 10 minutes? Show all of your work and/or explain your answer.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

**RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM B**

<b>SCORE</b>	<b>DESCRIPTION</b>
<b>4</b>	The student earns 4 points. The response contains no incorrect work. The response contains no labels on either the slope or y-intercept in Part 2. The correct label of “feet” is included in Part 3.
<b>3</b>	The student earns 3–3 ½ points.
<b>2</b>	The student earns 2–2 ½ points.
<b>1</b>	The student earns ½–1½ points, or some minimal understanding is shown. Ex: 2 correct heights in Part 1.
<b>0</b>	The student earns 0 points. No understanding is shown.
<b>B</b>	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

**PART II Released Algebra I Items**

**MATHEMATICS OPEN-RESPONSE ITEM C**

- C. The choral students sold tubs of cookie dough to raise money. The variable  $g$  represents the number of tubs of cookie dough sold by George.
1. The choir treasurer sold 3 more than 2 times the number of tubs of cookie dough sold by George. Write an expression to represent the treasurer's sales in terms of George's sales,  $g$ .
  2. Julie's sales are represented by the variable  $j$ . Julie's sales were equal to 1 less than the square root of George's sales. Write an equation to represent Julie's sales,  $j$ , in terms of George's sales,  $g$ .
  3. José wrote the following expression to represent his sales:  $4(g - 2)$ . Translate the expression for José's sales into a verbal sentence.
  4. Sam's sales, represented by the variable  $s$ , were greater than José's sales but less than the treasurer's sales. Write an inequality, in terms of  $g$  and  $s$ , to represent Sam's sales.

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

**RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM C**

<b>SCORE</b>	<b>DESCRIPTION</b>
<b>4</b>	The student earns 4 points. The response contains no incorrect work.
<b>3</b>	The student earns 3–3 ½ points.
<b>2</b>	The student earns 2–2 ½ points.
<b>1</b>	The student earns ½–1 ½ points, or some minimal understanding is shown.
<b>0</b>	The student earns 0 points. No understanding is shown.
<b>B</b>	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

**PART II Released Algebra I Items**

**MATHEMATICS OPEN-RESPONSE ITEM D**

D. Use the table below to answer the following.

$x$	$y$
-1	
0	
1	
2	
3	

1. Copy and complete the above table in your answer document for the equation  $y = x^2 - 2x - 2$ .
2. On the grid provided in your answer document, graph the parabola containing the points in the table.
3. What is the vertex of the parabola?
4. Is the vertex a minimum or a maximum?

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

**RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM D**

<b>SCORE</b>	<b>DESCRIPTION</b>
<b>4</b>	The student earns 4 points. The response contains no incorrect work.
<b>3</b>	The student earns 3–3 ½ points.
<b>2</b>	The student earns 2–2 ½ points.
<b>1</b>	The student earns ½–1 ½ points, or some minimal understanding is shown. Ex: 4 out of 5 $y$ -values are correct in the table (Part 1) with no credit in other parts.
<b>0</b>	The student earns 0 points. No understanding is shown.
<b>B</b>	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)

**PART II Released Algebra I Items**

**MATHEMATICS OPEN-RESPONSE ITEM E**

- E. The sport shop store manager found that the number of jump ropes sold is a function of the price,  $p$ , shown in the function below.

$$f(p) = 450 - 8p^2$$

1. Copy and complete the table below in your answer document. Describe how a change in price affects the number of jump ropes sold. Show and/or explain all of your work even if you use mental math or a calculator.

**Jump-Rope Sales**

$p$	\$3.00	\$3.50	\$4.00	\$4.50
$f(p)$				

2. Determine the highest price, to the nearest cent, that the manager can charge and still sell at **least** 1 jump rope. Show and/or explain all of your work even if you use mental math or a calculator.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

**RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM E**

SCORE	DESCRIPTION
<b>4</b>	The student earns 4 points. The response contains no incorrect work. The correct label of “\$” is included in Part 2.
<b>3</b>	The student earns 3 points.
<b>2</b>	The student earns 2 points.
<b>1</b>	The student earns 1 point, or some minimal understanding is shown. Ex: The response contains at least one correct answer in Part 1. Ex: The response contains a correct description in Part 1 with incorrect table—work is shown.
<b>0</b>	The student earns 0 points. No understanding is shown.
<b>B</b>	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” assigned for the item.)