ACTAAP

Arkansas Comprehensive Testing, Assessment, and Accountability Program

Released Item Booklet

Benchmark Examination
Grade 8

April 2007
Administration

Arkansas Department of Education

Table of Contents—2007 Benchmark Grade 8

PART I Overview—2007 Benchmark Grade 8

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, all Grade 8 students in Arkansas public schools participated in the *Grade 8 Benchmark Examination* in April 2007.

This *Released Item Booklet* for the *Grade 8 Benchmark Examination* contains test questions or items that were asked of students during the April 2007 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.

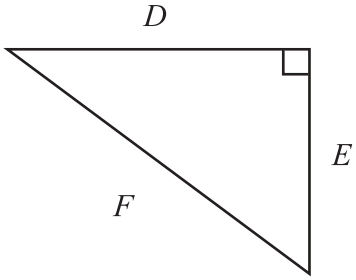
Students were given approximately two hours each day to complete assigned test sessions during the three days of testing in April 2007. Students were permitted to use a calculator for the Mathematics items (both multiple-choice and open-response), with the exception of questions 1–8 in this *Released Item Booklet* (items 1–10 in the test booklet). Students were also supplied with a reference sheet to be used during the Mathematics sessions so that all students would have equal access to this information during testing. (See the reference sheet on page 25 of this booklet.) All of the Mathematics, Reading, and Writing multiple-choice items within this booklet have the correct response marked with an asterisk (*). The open-response questions for Mathematics and Reading and the two essay prompts for Writing are listed with scoring guides (rubrics) immediately following. These rubrics provide information on the scoring model used for each subject, with the scoring model for Writing defining the overall curricular and instructional link for that subject with the Arkansas *English Language Arts Curriculum Framework*. The domain scoring model, implemented within Arkansas for a number of years, illustrates the appropriate instructional approaches for Writing within the State.

The development of the *Grade 8 Benchmark Examination* was based on the Arkansas Curriculum Frameworks. These frameworks have common distinct levels: *Strands* to be taught in concert, *Content Standards* within each Strand, and *Student Learning Expectations* within each Content Standard. Abridged versions of the Arkansas *Mathematics Curriculum Framework*, Arkansas *English Language Arts Curriculum Framework—Reading Strand*, and Arkansas *English Language Arts Curriculum Framework—Writing Strand* can be found in Part III of this booklet. It is important to note that these abridged versions list only the predominant Strand, Content Standard, and Student Learning Expectation associated with each item. However, since many key concepts within the Arkansas Curriculum Frameworks are interrelated, in many cases there are other item correlations or associations across Strands, Content Standards, and Student Learning Expectations.

Part III of the *Released Item Booklet* also 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 *Grade 8 Benchmark Examination* were developed in close association with the Arkansas educational community. Arkansas teachers participated as members of Content Advisory Committees for each subject area, providing routine feedback and recommendations for all items. Part III of the *Released Item Booklet* provides Arkansas educators with specific information on how the *Grade 8 Benchmark Examination* items align or correlate with the Arkansas Curriculum Frameworks to provide models for classroom instruction.

CALCULATOR NOT PERMITTED—ITEMS 1–8

1. Which is a **correct** statement of the Pythagorean theorem, using the figure below?



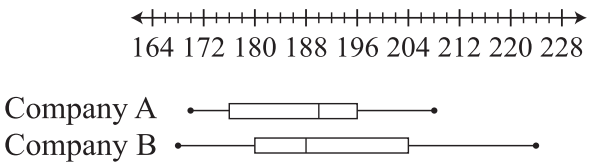
A. $E^2 = F^2 + D^2$

B. $D^2 = E^2 + F^2$

* C. $F^2 = D^2 + E^2$

D. $F^2 = D^2 - E^2$

2. The box-and-whisker plots below show the bushels of corn harvested, per acre, for two companies.



Which identifies the company having the largest interquartile range for its crop and the **correct** value for that range?

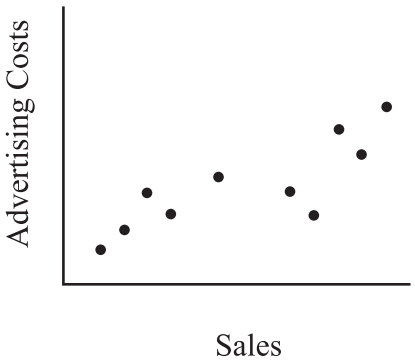
A. Company A, 35 bushels

B. Company B, 53 bushels

C. Company A, 20 bushels

* D. Company B, 24 bushels

3. A scatterplot was constructed showing the sales and advertising costs for ten companies in 1995.



Why was a scatterplot a good choice for displaying these data?

* A. It displays relationships between two variables.

B. It displays change over time.

C. It displays parts of a whole.

D. It displays categories.

4. Which lists the numbers below in order from **least** to **greatest**?

3.2×10^5 32,000 3.2×10^{-5}

A. 32,000 3.2×10^{-5} 3.2×10^5

B. 3.2×10^{-5} 3.2×10^5 32,000

C. 3.2×10^5 3.2×10^{-5} 32,000

* D. 3.2×10^{-5} 32,000 3.2×10^5

5. Sara keeps track of the number of miles she runs each day. She starts by running 2 miles the first day, and then increases the distance by $\frac{1}{4}$ of a mile each day. Which statement is true about the number of miles Sara runs in relation to the number of days she runs?

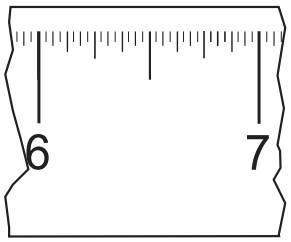
A. The number of miles is the independent variable.

* B. The number of days is the independent variable.

C. Neither the number of miles nor the number of days are the independent variable.

D. There is not enough information to tell which is the independent variable.

6. The figure below is a small section of an inch ruler. What are the smallest graduation marks on this ruler?



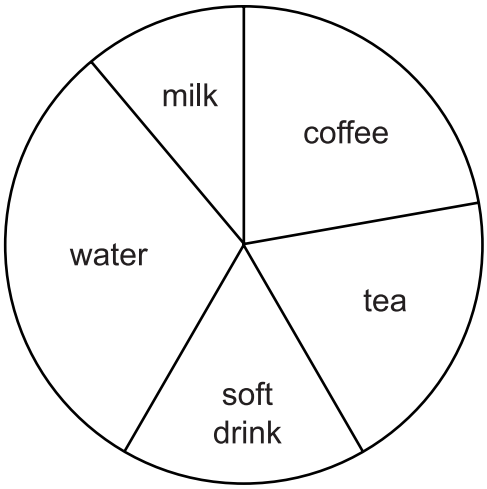
A. $\frac{1}{8}$ inch

B. $\frac{1}{16}$ inch

* C. $\frac{1}{32}$ inch

D. $\frac{1}{64}$ inch

7. Kara is a waitress in a restaurant. For three days she counted the number of different drinks she served and put the results in a pie chart, as shown below. Which beverage is represented by a 70-degree angle? You may use your protractor.



* A. tea

B. soft drink

C. water

D. coffee

8. Which operation should be used first to solve the equation below?

$$\frac{x}{2} + 3 = 11$$

* A. Subtract 3 from both sides.

B. Multiply both sides by x.

C. Divide both sides by 2.

D. Add 11 to both sides.

CALCULATOR PERMITTED—ITEMS 9–40

9. The manager of an ice cream store noticed that, on average, the number of chocolate milkshakes sold is 1 more than twice the number of strawberry milkshakes sold. Which table **best** represents this pattern?

A.

strawberry	1	2	3
chocolate	1	3	5

B.

strawberry	1	2	3
chocolate	2	3	4

C.

strawberry	1	2	3
chocolate	2	5	10

* D.

strawberry	1	2	3
chocolate	3	5	7

10. Tereese needs to add $1\frac{1}{2}$ gallons of fluid to her mixture. She only has a 1-cup measure.

How many cups should she add to her mixture to equal $1\frac{1}{2}$ gallons?

A. 16 cups

B. 18 cups

* C. 24 cups

D. 48 cups

11. Officer Jackson is researching recorded speeds on a particular roadway. Which data set has a mean closest to 34 mph?

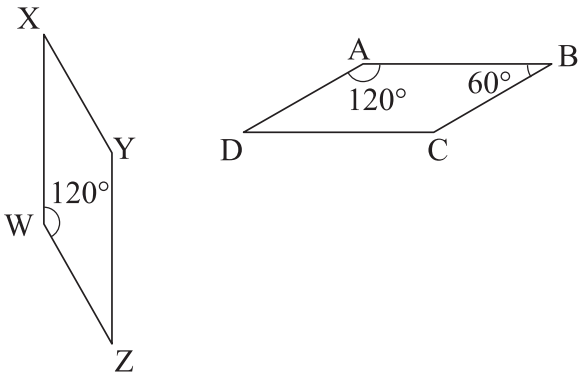
A. 34 34 36 37 38 44 45

B. 29 28 31 34 39 40 50

C. 30 29 28 40 55 24 25

* D. 14 34 25 36 38 39 54

12. Figure ABCD is similar to figure WXYZ.



Which completes the ratio below?

$$\frac{\overline{BC}}{\overline{XY}} = \frac{\overline{CD}}{?}$$

A. $\overline{WX}$

B. $\overline{WZ}$

* C. $\overline{YZ}$

D. $\overline{XY}$

13. What is the value of the expression below?

$$\frac{1}{5}\,[(5 + 14) - 2(7)]$$

A. 0

* B. 1

C. $23\frac{4}{5}$

D. 25

14. Values for the equation $y = 3x - 1$ are given in the table below.

x	*y*
1	2
2	5
3	8
4	11

Which statement is true?

* A. The independent variable is increasing by 1.

B. The dependent variable is decreasing by 3.

C. The independent variable is increasing by 3.

D. The value of the independent variable is twice the value of the dependent variable.

15. What is the solution to the inequality below?

$$8 - 5x > 33$$

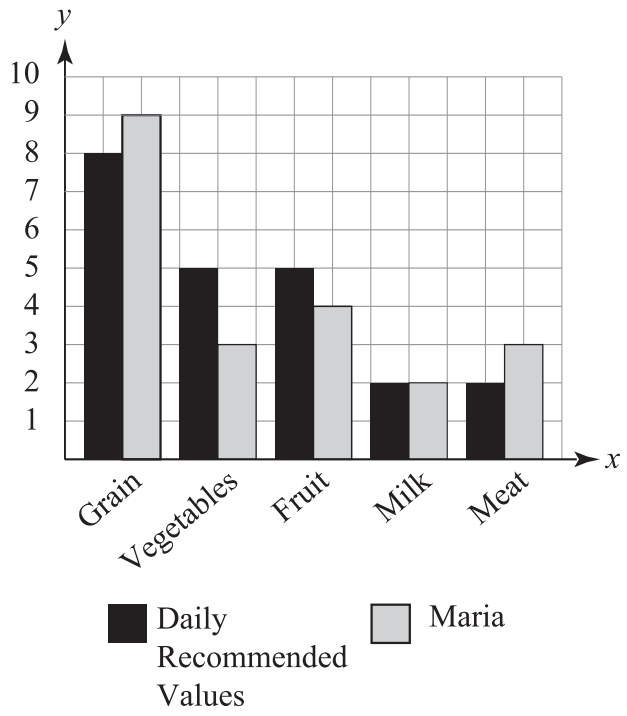
* A. $x < -5$

B. $x > -5$

C. $x < 11$

D. $x > 11$

16. Maria compared her eating habits with the daily recommended values in the graph below.



Maria needs to eat more of which foods?

A. grain and meat

B. grain and fruit

* C. vegetables and fruit

D. milk and meat

17. If $y = -2\frac{1}{8}$, and $x = 1\frac{1}{4}$, what is the solution for the expression below?

$$8y + 12x$$

A. $-3\frac{7}{8}$

* B. -2

C. $20\frac{7}{8}$

D. 32

18. Don is going to paint his garage, and he needs to calculate the surface area to determine how much paint to buy. What is the **best** unit of measure for this task?

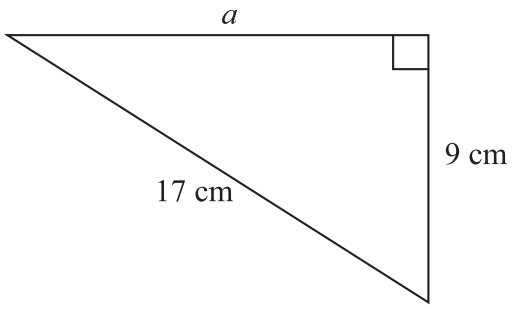
* A. square feet

B. square inches

C. square millimeters

D. square centimeters

19. The unknown side length, a, is the leg of the triangle, and **not** the hypotenuse because



A. it is the longest side next to the right angle.

B. it has to equal 8, so it is the shortest side.

* C. it is not opposite the right angle.

D. it is on the top of the triangle.

20. What is the solution to the equation below?

$$-\frac{x}{6} + 2 = 14$$

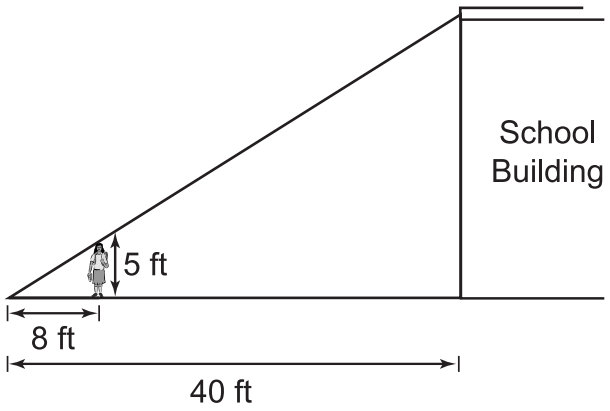
A. $x = -96$

B. $x = 72$

C. $-x = 72$

* D. $x = -72$

21. Mayra wants to find the height of her school building. She stands 40 feet away from the building. A 5-foot-tall friend stands 8 feet in front of her.



What is the height of Mayra's school building?

A. 20 feet

* B. 25 feet

C. 40 feet

D. 64 feet

22. What is the solution to the expression below when $x = 3$, and $y = \frac{1}{2}$?

$$2x^2 - 4y$$

A. 8

* B. 16

C. $17\frac{1}{2}$

D. 34

23. Jim measured the length of his rope to be 5 yards plus 384 inches. What is the length of Jim's rope, in feet?

A. 37 feet

B. 45 feet

* C. 47 feet

D. 53 feet

24. In basketball, players shoot free throws after they have been fouled. Assume the theoretical probability of making a free throw is $\frac{1}{2}$. Justin made 28 out of 35 free throws. How do the two probabilities compare?

A. The two probabilities are equal.

B. The difference of the two probabilities is $\frac{27}{33}$.

C. The theoretical probability is 30% higher than Justin's experimental probability.

* D. Justin's experimental probability is 30% higher than the theoretical probability.

25. A $53 racquet at Sports Heaven is on sale for 20% off the regular price. Sales tax is $8\frac{1}{4}\%$. What will be the total cost of the racquet, including the discount and taxes?

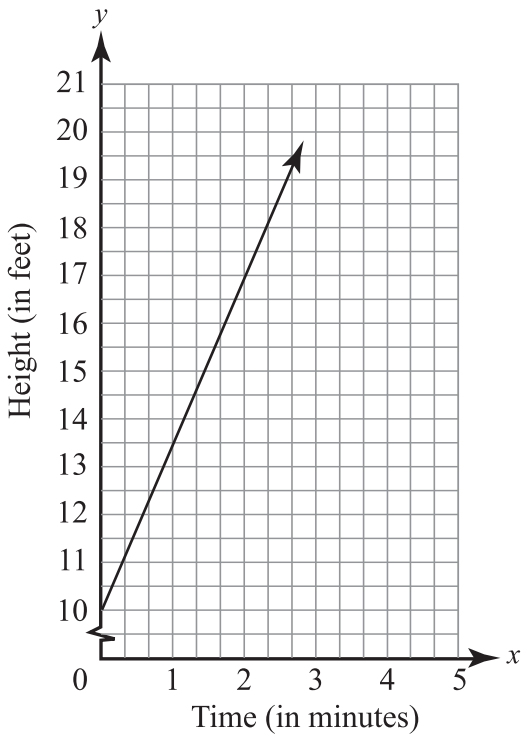
A. $38.90

B. $42.40

C. $45.00

* D. $45.90

26. Emma climbs up a ladder to get into a hot-air balloon. The balloon is set to rise at a constant rate. Below is a graph of the balloon's height from the ground as it begins to rise.



Which statement is true?

A. The ladder Emma climbed is 3 feet tall.

* B. The ladder Emma climbed is 10 feet tall.

C. The balloon rises at a rate of 10 feet per minute.

D. The balloon rises at a rate of 13 feet per minute.

27. The measurements of the one-centimeter (cm) cube shown below are displayed in the following table.

Measurements of Cube

	One-Centimeter Cube	Two-Centimeter Cube
length of an edge	1 cm	2 cm
perimeter of a face	4 cm	P
area of a face	1 cm^2	A
volume of the cube	1 cm^3	V

Which values **correctly** complete the table?

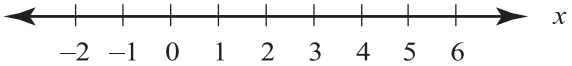
* A. $P = 8$ cm, $A = 4$ cm^2, $V = 8$ cm^3

B. $P = 8$ cm, $A = 4$ cm, $V = 8$ cm^3

C. $P = 8$ cm, $A = 4$ cm^2, $V = 4$ cm^3

D. $P = 4$ cm, $A = 8$ cm^2, $V = 8$ cm^3

28. Which number can be found on the number line below?



A. $-\sqrt{6}$

B. $-(1.5)^2$

* C. $\sqrt{22}$

D. 3.8^2

29. Which rule **correctly** describes the function table below?

x	–3	–1	0	2	4
$f(x)$	6	–2	–3	1	13

A. $f(x) = x^2 + 3$

* B. $f(x) = x^2 - 3$

C. $f(x) = -x^2 + 3$

D. $f(x) = -x^2 - 3$

30. The weights, in pounds, of pumpkins exhibited at the state fair are shown in the table below.

Name	Pumpkin Weight
Sam	48
Jenna	46
Taylor	54
Derek	52
Tasha	32
Kristin	5
Nate	59
Logan	38
Myki	41

Kristin's pumpkin weighs considerably less than the other pumpkins. How does the inclusion of this outlier affect the measures of central tendency in this table?

A. The range is lower.

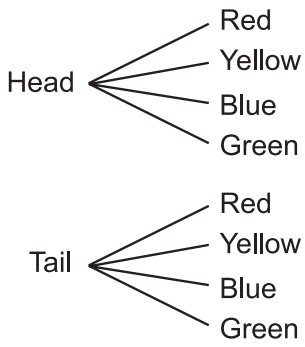
* B. The mean is lowered.

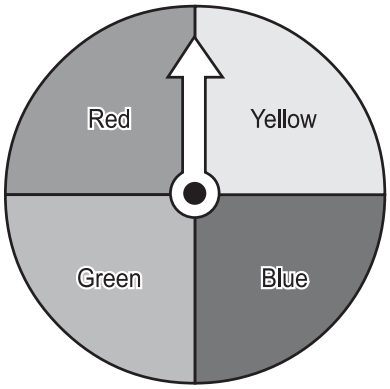
C. The mode is changed.

* D. The median is changed.

*Responses B and D are both correct for item 30. Students were given credit for either answer.

31. A tree diagram of the outcomes of flipping a fair coin and spinning the spinner is shown below.





What is the probability of flipping a head with the fair coin and landing on the green space on the spinner?

* A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. $\frac{2}{8}$

D. $\frac{1}{2}$

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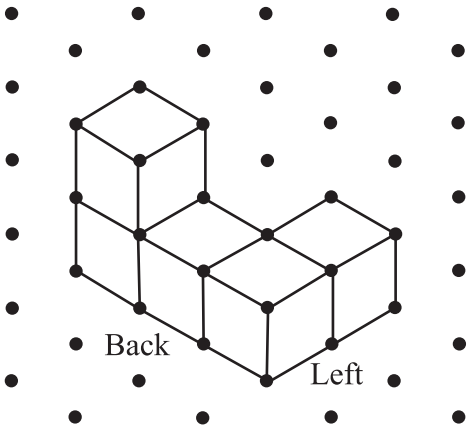
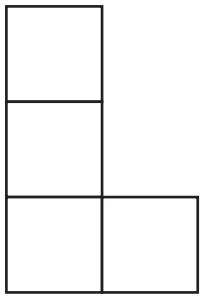
32. The isometric drawing below is the back-left view of the object. What view is represented in the figure to the right of the isometric drawing?





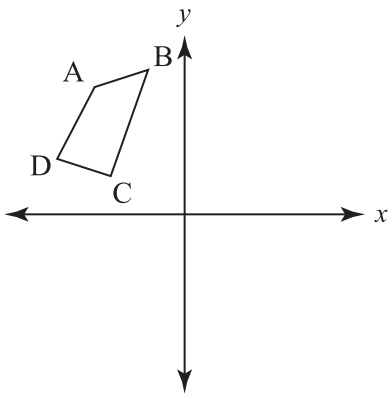
* A. top view

B. left view

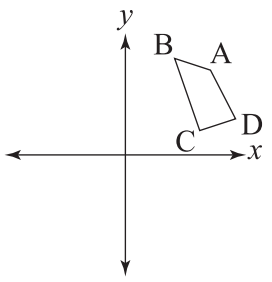
C. right view

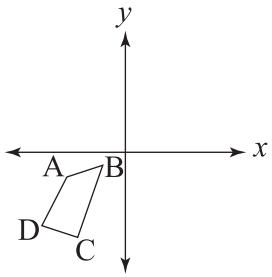
D. front view

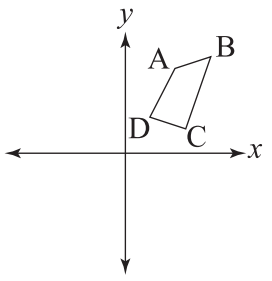
33. Figure ABCD is shown below.

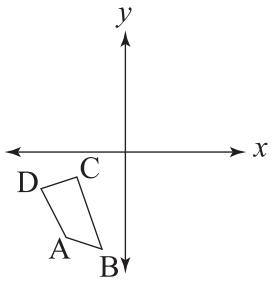


Which is the reflection of figure ABCD over the *x*-axis?

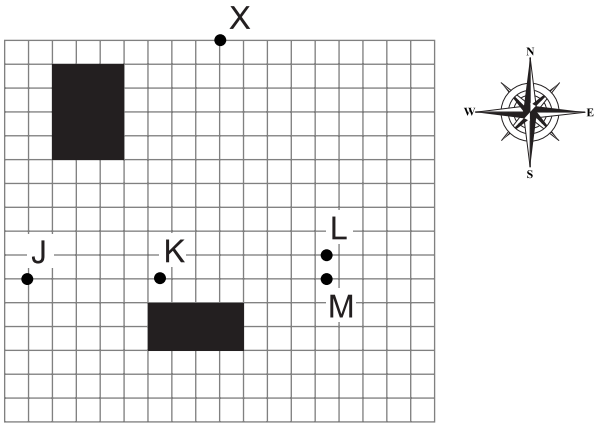
A.


B.


C.


* D.


34. Penny is using the map below for directions to drive to her friend's house. Once she gets to point X on the map, she is to go south $1\frac{1}{4}$ in., and then go east $\frac{9}{16}$ of an in. At what point should she end? You may use your ruler.



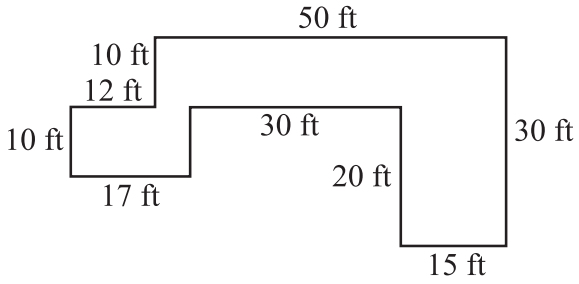
A. J

B. K

C. L

* D. M

35. What is the area, in square feet, of the figure below?



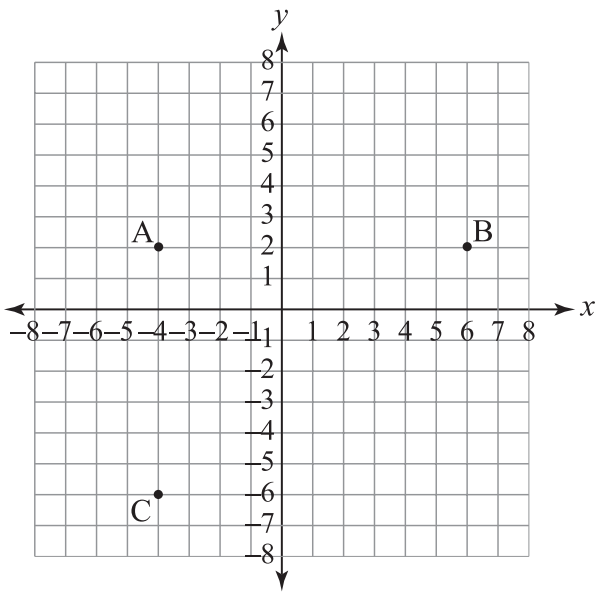
A. 920 sq ft

B. 950 sq ft

* C. 970 sq ft

D. 1,050 sq ft

36. In the graph below, when points A, B, and C are connected, they form a right triangle. What is the distance from point B to point C?



A. $\sqrt{18}$

B. $\sqrt{41}$

C. $\sqrt{116}$

* D. $\sqrt{164}$

37. What are the LCM and GCF of the algebraic expressions below?

$$8x^3y^2$$
$$12x^4y^3$$
$$16x^3y^3$$

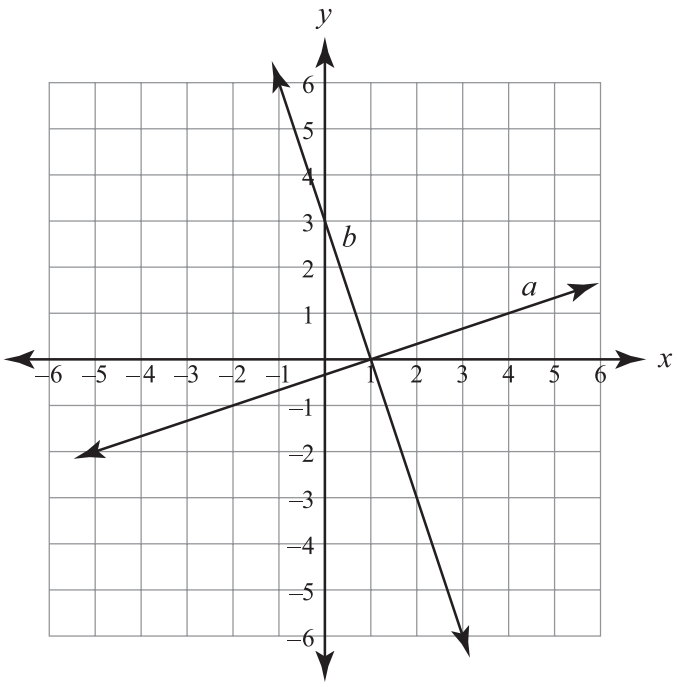
* A. LCM = $48x^4y^3$, GCF = $4x^3y^2$

B. LCM = $4x^3y^2$, GCF = $48x^4y^3$

C. LCM = $24x^4y^3$, GCF = $4x^3y^2$

D. LCM = $4xy^2$, GCF = $8x^3y^2$

38. Given lines *a* and *b* shown below, which is true?



Lines *a* and *b* are perpendicular because

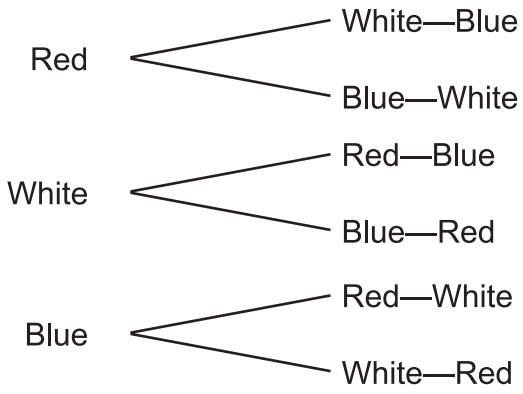
A. the slope of line *a* is $\frac{1}{3}$, and the slope of line *b* is 3.

* B. the slope of line *a* is $\frac{1}{3}$, and the slope of line *b* is –3.

C. the slope of line *a* is 3, and the slope of line *b* is $\frac{1}{3}$.

D. the slope of line *a* is –3, and the slope of line *b* is $-\frac{1}{3}$.

39. A red, a white, and a blue jelly bean are in a cup. Three students each draw one jelly bean from the cup, without replacing it.



According to the tree diagram above, what is the theoretical probability of drawing a red jelly bean first, a white second, and a blue third?

A. 2 out of 6

* B. 1 out of 6

C. 1 out of 3

D. 1 out of 2

40. On average, Juan types 35 words per minute. The time it takes Juan to type a book report depends on how many words are in his report. This would be described as $f(x) = \frac{x}{35}$. What is the independent variable in this case?

A. the length of the book read

B. the rate at which Juan types

* C. the number of words in the report

D. the time it takes Juan to type the report

MATHEMATICS OPEN-RESPONSE ITEM A

A. Greg and Pam are each building a pyramid of blocks. The number of blocks needed is represented by the rule $\frac{n(n+1)}{2}$, where n is the number of levels in the pyramid. The pattern for the pyramid is shown below.

1. In your answer document, draw the next pattern in the sequence.

2. How many blocks would be in a 10-level pyramid? Show your work.

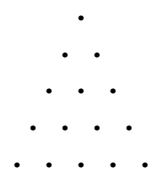
3. Greg has 4-inch blocks, and Pam has 2-inch blocks. They are each going to build a 24-inch tall pyramid. Greg predicts he will need half as many blocks as Pam since his blocks are twice as large. Compare the pyramids to explain why Greg is incorrect.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM A

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3–3½ points.
2	The student earns 2–2½ points.
1	The student earns ½–1½ 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.)

Solution and Scoring

Part	Points
1	**1 point possible** 1 point: **Correct diagram as shown below.** 
2	**1 point possible** ½ point: **Correct answer: 55.** AND ½ point: **Correct and complete procedure shown and/or explained.** Work may contain a calculation or counting error (± 1). Give credit for the following or equivalent: • $\frac{(10)(10+1)}{2}$ = #, or • 10 + 9 + 8 + ... + 3 + 2 + 1 = #, or • "Multipy the number of levels (10) by (10 + 1) then divide by 2 to get the number of blocks," or • Drawing of 10-level pyramid with statement, "I counted the number," or shows evidence of counting and number is 55 ± 1.

Part	Points
3	**2 points possible** 2 points: **Correct and complete procedure shown and/or explained.** Note: If all work is correct, no additional statement comparing the number of blocks is needed. Give credit for the following or equivalent: Greg: $24 \div 4 = 6$ blocks high (levels), $\frac{6(6+1)}{2} = 21$ blocks Pam: $24 \div 2 = 12$ blocks high (levels), $\frac{12(12+1)}{2} = 78$ blocks, $\frac{1}{2}(78) \neq 21$ (may be omitted) OR 1 point: **Work and/or explanation is incomplete, but correct procedures are used.** Work may contain a calculation or copy error. Ex: "Greg needs $6 \times 7 \times \frac{1}{2} = 21$ and Pam needs $12 \times 13 \times \frac{1}{2} = 78$." (No calculation of number of levels shown.) Ex: Greg: $\frac{24}{4} = 8$ blocks high (calculation error) $8 \times 9 \times \frac{1}{2} = 36$ Pam: $(12)(13)(\frac{1}{2}) = 78$ $\frac{1}{2}(78) \neq 36.$ Ex: $24 \div 4 = 6$ and $24 \div 2 = 12$, so Greg needs 21 and Pam needs 78. Ex: Pam needs 78 **and** Greg needs 21 (no work shown). OR ½ point: **Correct number of blocks for Greg <u>or</u> Pam, with or without procedure shown.** Or **Correct number of levels for both Greg and Pam (must be clear that number of levels and not number of blocks is being found).**

MATHEMATICS OPEN-RESPONSE ITEM B

B. The eighth-grade students at River Middle School were surveyed to see what type of television show was their favorite. Below are the results.

Survey of 200 Eighth-Grade Students' Favorite Type of Television Show

Type of Show	Number of Boys	Number of Girls
comedy	40	32
reality	18	13
cartoons	32	15
drama	10	40

1. On the grid provided in your answer document, draw a double-bar graph of the data given in the table in order to compare the boys to the girls. Remember to use all graphing techniques in completing your graph.

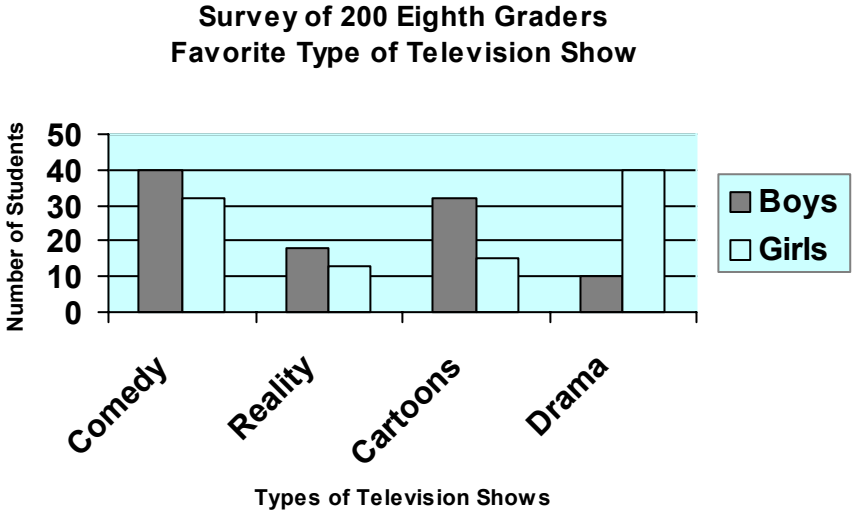
2. According to the shape of the data in your bar graph, what is one conclusion that can be made about the outcome of the survey?

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM B

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown. Ex: 2 major errors. Ex: 1 major error and 4 or 5 minor errors if the bar heights are off by no more than 5 units.
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.)

Solution and Scoring

Part	Points
1	**3 points possible** 3 points: **Correct and complete double bar graph that contains all of the following:** • Labels "Types of TV Shows" on the x- axis and "Number of Students" on the *y*-axis. • Labels "Comedy," "Reality," "Cartoons," and "Drama" on the bars. • Interval on "Number of Students" axis is consistent. • Bars are same width. • All bars are the correct height (correct half of appropriate box). • Key is included to distinguish "Boys" from "Girls." • "Boys" and "Girls" bars are distinguished in graph. • Title is included (for a score of 4).  OR 2 points: **Graph contains 1 minor error or omission.** Ex: One label is missing on bars. Ex: One bar is the incorrect height. Ex: Labels missing on *x*- and/or *y*-axes. OR 1 point: **Some understanding of double bar graphs is shown.** • Graph contains 2–3 minor errors or omissions. Ex: Two bars are the incorrect height or are missing. Ex: The *y*-axis label is missing, 1 bar incorrect height. or • Graph contains 1 major error (inconsistent intervals and up to 3 minor errors, "Boy"–"Girl" bars aren't differentiated) with or without minor errors. Ex: Intervals are inconsistent, x-axis label is missing. Ex: "Boy" and "Girl" bars for "Type of Show" are non-adjacent.

Part	Points
2	**1 point possible** 1 point: **One correct conclusion.** Examples: • "The girls like drama shows more than the boys." • "The number of boys who like comedy is the same as the number of girls who like drama." • "The number of boys who like cartoons is the same as the number of girls who like comedy." • "The boys like reality shows more than the girls." • "The boys like comedy best and the girls like drama best." • Give credit for using "watch" instead of "like." Ex: More boys watch comedy shows than girls do. **Note: Do not give credit for conclusions referring only to boys or to girls but not both.**

MATHEMATICS OPEN-RESPONSE ITEM C

C. Answer the following.

1. On the grid provided in your answer document, plot a triangle with the vertices (2, 5), (–3, 6), and (–2, 3).

2. Plot a triangle congruent to the triangle in Part 1, located 5 units to the right and 3 units down. What are the new coordinates of the vertices after the transformation has been performed?

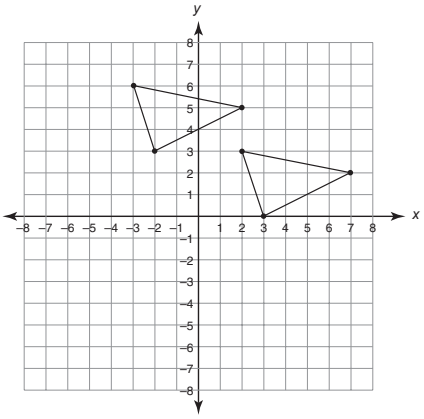
3. Classify the transformation as being either a reflection, translation, or rotation.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM C

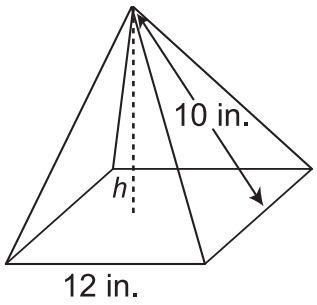
SCORE	DESCRIPTION
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of "B" will be reported as "NA." (No attempt to answer the item. Score of "0" assigned for the item.)

Solution and Scoring

Part	Points
1	**1 point possible** 1 point: **The triangle is drawn correctly (see Part 2 for diagram).** • Three vertices plotted correctly at (2, 5), (-3, 6), and (-2, 3). • Segments between vertices are connected.
2	**2 points possible** 2 points: **The response is correct and complete.** The triangle in Part 1 is correctly translated 5 units right and 3 units down, and 3 correct ordered pairs of the vertices of the translation are listed: (7, 2), (2, 3), (3, 0). Note: Translation may be based on incorrect triangle drawn in Part 1. Ex:  OR 1 point: **The response is incomplete or incorrect due to 1 counting error ±1 or 1 copy error.** Any other error will be considered a procedural error. Note: The translation may be based on an incorrect triangle in Part 1. Give credit for the following: • Translation is correctly plotted (based on Part 1), but ordered pair(s) are incorrect or missing, or • Translation is incorrectly plotted due to a counting error ± 1 or copy error. Three ordered pairs are correct based on counting or copy error, or are named (7, 2), (2, 3), (3, 0). Ex: Part 1 is correct: (2, 5), (-3, 6), (-2, 3) are correctly plotted. Vertices of the translation are plotted and named as follows: (8, 2), (2, 3), (3, 0). First *x*-coordinate is +1 (counting error +1). Ex: Part 1 is correct: (2, 5), (-3, 6), (-2, 3) are correctly plotted. Vertices of the translation are plotted and named as follows: (7, 3), (2, 4), (3, 1). The *y*-coordinates are shifted down 2 (copy error – 1). Note: Do not give any credit if translation is incorrect due to a procedural error.
3	**1 point possible** 1 point: **Correct answer: Translation.** Note: No reason is required, but if one is given, it may not be incorrect.

MATHEMATICS OPEN-RESPONSE ITEM D

D. The figure below is a pyramid with a slant height of 10 inches and a 12-inch square base.



1. What is the surface area of the pyramid? Show your work.

2. Find the height, *h*, of the pyramid. Show your work.

3. What is the volume of the pyramid? Show the formula and your work.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM D

SCORE	DESCRIPTION
4	The student earns 6 points. The response contains no incorrect work. The response contains the correct labels of "square inches" in Part 1, "inches" in Part 2, and "cubic inches" in Part 3.
3	The student earns 4–5 points.
2	The student earns 3 points or 2 points if the points are from different parts.
1	The student earns 2 points from the same part, or the student earns 1 point, or some minimal understanding is shown. Ex: The student finds the area of the base and four triangles in Part 1 but does not add. Ex: The student finds the area of at least one triangle in Part 1.
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.)

Solution and Scoring

Part	Points
1	**2 points possible** 1 point: **Correct answer: 384 (square inches).** Do not give credit for answer if incorrect procedure is used. AND 1 point: **Correct procedure shown and/or explained.** Work may contain a calculation or copy error. Give credit for the following or equivalent: • *SA* = area of base + area of four sides = $(12\times12) + 4\left(\frac{1}{2}\times12\times10\right) =$ Total #, or • "The area of one side is $\frac{(12)(10)}{2}$ or 60, so 4 would be 240, the area of the base is 12^2 or 144, so I added and got 384," or • 144 + 240 = 384.
2	**2 points possible** 1 point: **Correct answer: 8 (inches).** Do not give credit for answer if incorrect procedure is used. AND 1 point: **Correct and complete procedure shown and/or explained.** Work may contain a calculation or copy error. Give credit for the following or equivalent: • $h^2 + 6^2 = 10^2$, $h^2 = 64$, $h = 8$, or • "*h* and 6 are legs of a right triangle with a hypotenuse of 10. This would make a 6-8-10 right triangle, so the height is 8."
3	**2 points possible** 1 point: **Correct answer: 384 (cubic inches)—will also accept 380.16, 383.616 to 384, or correct answer based on an incorrect height given in Part 2 <u>and/or</u> incorrect area of base in Part 1.** Do not give credit for answer if incorrect procedure is used. AND 1 point: **Correct and complete procedure shown and/or explained.** Work may contain a calculation or copy error or may be based on an incorrect height given in Part 2. Give credit for the following or equivalent: • Volume = $\left(\frac{1}{3}\times12\times12\times8\right) = 384$, or • $v = .33\times12^2\times8 = 380.16$, or • "I multiplied the area of the base 144 by the height of 8 and divided the product by 3 to get the volume."

MATHEMATICS OPEN-RESPONSE ITEM E

E. Answer the following.

1. On the grid provided in your answer document, write the numbers below in order from **least** to **greatest**.

$$5 \quad 3.14159 \quad \sqrt{3} \quad -2 \quad \frac{3}{4} \quad -0.5 \quad -1.51511$$

2. Draw a number line on which all the numbers will fit.

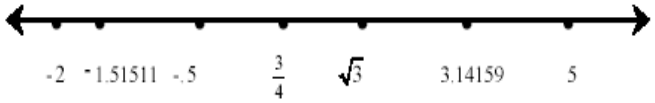
3. Plot each number on the number line from Part 2, using a dot for each, and label the number.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM E

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3–3½ points.
2	The student earns 2–2½ points.
1	The student earns ½–1½ points.
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.)

Solution and Scoring

Part	Points
1	**1 point possible** 1 point: **Correct listing of the seven numbers from least to greatest.** $-2,\ -1.51511,\ -.5,\ \frac{3}{4},\ \sqrt{3},\ 3.14159,\ 5$ OR ½ point: **Incorrect listing of numbers due to one number missing or placed incorrectly.** Going from left to right, cover up the first number that is placed incorrectly. Give credit if the 6 uncovered numbers are in the correct order.
2	**1 point possible** 1 point: **Correct and complete number line that contains the following:** • Integers from –2 to 5 are identified on the line (#'s and marks.) If the grid is used and each block on the grid represents the distance between consecutive integers, the numbers do not have to be identified. • Distance between integers is consistent. • Arrows show the line extends in both directions (3/4 score issue).
3	**2 points possible** 2 points: **All seven points are plotted correctly and labeled.** Points are located in the correct half of the appropriate interval (half marks need not be identified.) -2 -1.51511 -.5 $\frac{3}{4}$ $\sqrt{3}$ 3.14159 5  OR 1 point: **All seven points are in order and plotted in the correct half of the appropriate interval, but intervals are inconsistent or points are plotted above or below the number line.** Or **All the following 1 point responses assume consistent intervals:** All seven points are in order with six points plotted in the correct half of the appropriate interval. Or One number is plotted incorrectly or is missing with six points plotted in the correct half of the appropriate interval. Or All points are plotted correctly but are not identified, <u>if Part 1 is completely correct.</u> Or All points plotted "correctly" but are above or below the number line. OR ½ point: All points are in the correct interval but at least two are in the incorrect half of the interval. Or All points are plotted in the correct relative position. Ex: 

Mathematics Reference Sheet
Grade 8

Use the information below, as needed, to answer questions on the Mathematics test.

Square Area = s^2 Perimeter = $4s$	**Rectangle** Area = lw Perimeter = $2(l + w)$	**Triangle** Area = $\frac{1}{2}bh$ Perimeter = $a + b + c$
Circle Area = πr^2 Circumference = $2\pi r$	**Parallelogram** Area = bh Perimeter = $2a + 2b$	**Equilateral Triangle** Perimeter = $3s$
Cube Volume = s^3	**Cone** Volume = $\frac{1}{3}\pi r^2 h$ Surface Area = $\pi rl + \pi r^2$ Slant Height = l	**Rectangular Prism** Volume = lwh
Pyramid Volume = $\frac{1}{3}$ (area of base)h	**Sphere** Volume = $\frac{4}{3}\pi r^3$ Surface Area = $4\pi r^2$	**Cylinder** Volume = $\pi r^2 h$ Surface Area = $2\pi rh + 2\pi r^2$
		Trapezoid Area = $\frac{1}{2}h(b_1 + b_2)$

Miscellaneous Formulas and Conversions

Sum of interior angles of a polygon having n sides: $(n-2)180°$

Slope of (non-vertical) line: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Distance between points on a coordinate plane: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint: $\left(\dfrac{x_2 + x_1}{2}, \dfrac{y_2 + y_1}{2}\right)$

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet

$\pi \approx 3.14$

1 cup = 8 ounces (oz)
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 kilogram = 1000 grams
1 meter = 100 centimeters
1 decimeter = 10 centimeters
1 centimeter = 10 millimeters
1 kilometer = 1000 meters
1 liter = 1000 milliliters

Read the following passage about Alexander the Great. Then answer multiple-choice questions 1 through 8 and open-response question A.

EDUCATING A CONQUEROR: HOW ALEXANDER BECAME THE GREAT

by Shulamith Levey Oppenheim

One day, when he was six or seven, two Persian envoys[1] arrived at the palace. King Philip was away subduing warring tribes, and Alexander greeted the men. The envoys saw a boy who carried himself proudly. He had fair hair waving about his face and across his shoulders, and his features were near perfect, with deep-set violet eyes. As he spoke, a flush of excitement blushed his cheeks.

The envoys were amazed. The child did not ask about the legendary Hanging Gardens of Babylon or the kinds of games Persian children played. Instead, he asked about the size of the Persian Empire, its customs, and how fast its armies could travel across vast regions. The two diplomats came away more than impressed with the young prince.

At this time Alexander's world included his parents, tutors, servants, and boys his own age from noble families. He learned very early on that he was born to be a king and a commander of armies. He excelled in swordplay, archery, javelin throwing, and horsemanship, riding almost before he could walk.

Besides his military training, supervised by his first tutor, Leonidas, Alexander was taught to read and write. Special emphasis was put on thinking logically and expressing himself clearly. An accomplished musician, he played the lyre, a stringed instrument.

When Alexander was almost ten, a new tutor took over his education. His name was Lysimachus. This man was far less cultured than Leonidas, but he held one great advantage. He knew that Alexander's mother, Olympias, proudly traced her ancestry back to Achilles, hero of the Trojan War, and that Alexander even now was trying to become another Achilles. So the clever Lysimachus called his pupil "Achilles." He referred to King Philip as "Peleus," the father of Achilles, and called himself "Phoenix," Achilles' legendary tutor.

About three years later, an incident took place that showed Alexander's ability to see what others, much older and more experienced than he, often missed.

It was a beautiful spring day, and father and son stood together, observing a majestic black stallion. His name was Bucephalus, and his purchase price had been beyond anything paid before—about $75,000 in today's terms. Alexander felt his heart race in his chest. He adored horses, and this was indeed a glorious creature. But Bucephalus refused to be mounted, rearing and bolting and raging at the slightest attempt. In a fit, Philip ordered the horse to be returned to the merchant Philonicus.

Suddenly Alexander asked his father if he might try mounting the horse. Philip answered that no one had been able to do so. Alexander insisted. His father relented, asking what he planned to do if he failed. Alexander replied that he would buy the horse himself.

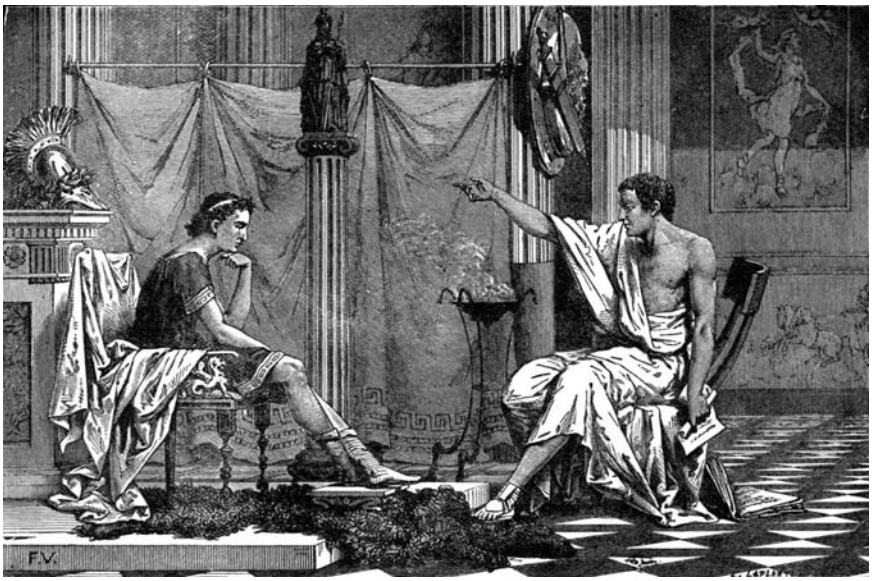
Without hesitation, Alexander took hold of the bridle and turned the magnificent animal directly into the sun. He spoke softly to Bucephalus, and slowly the horse's panting and rearing ceased. As the great stallion lowered his head, Alexander sprang onto his back and rode him. What Alexander had noticed was that, when Bucephalus had his tail

[1] envoys: diplomatic messengers

to the sun, the horse's shadow lay before him, and as he moved, so did the shadow, growing larger and larger, plunging and rearing, terrifying the horse.

As the onlookers cheered, Philip, filled with relief and pride, uttered these prophetic words: "My son, seek out a kingdom for yourself. Macedonia has no room for you."

From that day, Alexander and Bucephalus became inseparable. Even years later, when the grand creature had grown too old to ride into battle, Alexander would mount him for a few minutes and trot him gently before the troops, then dismount and kiss him. When Bucephalus died, seventeen years after that radiant spring day, he was given a royal burial and a city was named for him. The ruins of that city, Bucephalia, still remain in what is today Kashmir.



After Alexander's dazzling success with Bucephalus, Philip realized his exceptional son needed an exceptional teacher. And so he chose Aristotle, the brilliant philosopher whose father had been physician to Philip's father.

Aristotle was already celebrated as one of the greatest minds of his time, a reputation that has not lessened to this day. He had a thorough knowledge of geometry, mathematics, botany, zoology, geology, astronomy, and medicine.

14 Eager to further his son's education, Philip set up an ideal environment for study and contemplation in a place called Mieza, not far from the capital city of Pella. In the calm of shady walks and secluded nooks, stone benches beckoned Alexander and his companions, all sons of nobles, to sit beside the master Aristotle, to listen and debate. Alexander's mind expanded beyond his father's fondest hopes. He loved to learn and, especially, he loved the healing arts.

Aristotle taught that all knowledge was essential to the pursuit of a fruitful life, not just the sciences but also literature and music. First and foremost, however, was the sharpening of the mind. Aristotle encouraged his pupil to observe, to think through, to reason. Alexander had already proven himself when he brilliantly observed Bucephalus and then tamed him. Now Aristotle strengthened this ability. He taught Alexander the advantage of seeing both sides of a problem and of being able to argue successfully in favor of either.

The one area of disagreement between teacher and student was Aristotle's belief that all who were not Greek were barbarians and possessed the nature of slaves. He counseled Alexander to be a leader to Greeks and a tyrant to all others. Alexander did not agree. He believed in taking each human being on his or her own merit.

Nonetheless, Alexander thrived under Aristotle's guidance. When he was older, he confided to a friend, "My father gave me life, but it was Aristotle who taught me how to live the noble life."

When Alexander was sixteen, Philip decided it was time his son had a taste of the responsibility that would someday be his alone. The king left Alexander in charge of Macedonia while he went off on an expedition.

The moment Philip's back was turned, an unruly tribe in the north began a revolt, believing their chances of success against a sixteen-year-old boy to be excellent. They were wrong! Alexander subdued the rebels, captured their city, and renamed it Alexandropolis.

Four years later, just as Philip was mounting a campaign to invade Persia, he was assassinated, and Alexander became king. He was twenty years old.

Now began an unparalleled journey of conquest for this brilliant, at times recklessly courageous—but more often calculating—young man.

1. How did Alexander prove that he was a successful leader?

A. He revealed his athletic skills.
* B. He stopped the revolt of a northern tribe.
C. He mounted the horse that others failed to ride.
D. He showed that he could see both sides of a dispute.

2. On what issue did Alexander and Aristotle disagree?

A. the most effective weapons for battle
B. the overall strategy for decisive warfare
C. the proper technique for military training
* D. the correct treatment of conquered people

3. Why is the story of Alexander's mounting of the horse Bucephalus included in the passage?

A. to show his strength
B. to point out that he is reckless
C. to demonstrate his leadership abilities
* D. to emphasize his powers of observation

4. Based on the passage, with which statement would Aristotle agree?

A. All people should be considered equal.
B. Literature is an unimportant subject for study.
C. The most important skill for a future king is training in warfare.
* D. Education should include knowledge of sciences, literature, and art.

5. According to the passage, what was a recurring problem that Philip and Alexander faced while ruling?

A. acquiring sufficient horses
* B. subduing unruly, warring tribes
C. adequately equipping the army
D. treating conquered people fairly

6. Based on the passage, which is an accurate description of Aristotle?

* A. He believed in teaching his students to reason.
B. He believed that all people are equally endowed.
C. He wanted Alexander to become a fierce warrior.
D. He wanted Alexander to concentrate on the study of literature.

7. Which detail **best** identifies the third-person point of view used in the passage?

* A. the use of the pronoun "he"
B. the detailed connection to Achilles
C. Alexander's interview with the Persian envoys
D. the relationship between Alexander and his father

8. Based on its use in paragraph 14, what is the meaning of <u>secluded</u>?

A. dark
* B. hidden
C. obvious
D. uncomfortable

READING OPEN-RESPONSE ITEM A

A. The passage describes three different tutors who taught the young Alexander. Identify two of these tutors and explain the contributions each made to Alexander's education. Use information from the passage to support your answer.

RUBRIC FOR READING OPEN-RESPONSE ITEM A

SCORE	DESCRIPTION
4	The response identifies two tutors and explains the contributions each made to Alexander's education using specific details from the passage.
3	The response identifies two tutors and explains the contributions each made to Alexander's education using general details from the passage.
2	The response identifies one tutor and explains the contributions he made to Alexander's education using limited or inappropriate details from the passage.
1	The response demonstrates a minimal understanding of the role of the tutors. **OR** The response provides limited or inappropriate details from the passage.
0	The response is totally incorrect or irrelevant. There is no evidence that the student understands the task, or the response may be off-topic.
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 Reading Items—2007 Benchmark Grade 8

Read the following passage. Then answer multiple-choice questions 9 through 16 and open-response question B.

For a copy of the reading passage, "The Sky's the Limit" by Heather M. Hopkins, please refer to the hard copy version of the Released Item Booklet.

For a copy of the reading passage, "The Sky's the Limit" by Heather M. Hopkins, please refer to the hard copy version of the Released Item Booklet.

9. According to the passage, when did Mae Jemison relive a childhood memory?

A. when she was admitted to Stanford University

* B. when she got to see the stars from space

C. when she practiced medicine in Africa

D. when she became a scientist

10. What is the main reason for the use of boldface type in "The Sky's the Limit"?

A. to indicate the author's opinion

B. to specify areas for further study

C. to arrange information into paragraphs

* D. to introduce the passage's main subjects

11. The introduction states that opportunities at NASA are "out of this world." Which **best** explains the use and meaning of this phrase?

A. It means that at NASA, there are opportunities to leave the planet.

B. It is an example of personification, used to make NASA seem more alive.

* C. It is a figure of speech which means that the opportunities at NASA are amazing.

D. It is a comparison between opportunities at NASA and those elsewhere in the world.

12. Which **best** describes the mood of this passage?

* A. inspirational

B. emotional

C. humorous

D. serious

13. Which of the following **best** describes a theme of this passage?

A. Life can be a long and difficult journey.

B. All great accomplishments are the result of team effort.

* C. There are opportunities available for everyone in this country.

D. One of the important keys to success is remaining loyal to your friends.

14. How could this passage **best** be used?

* A. for a school report on NASA's scientists

B. for a newspaper article about the space shuttle

C. for a scientific study on the effects of space on humans

D. for a presentation at a conference about the study of the moon

15. What is a main idea presented in the passage?

A. Women should work hard to become space scientists.

* B. Success usually depends on how talents and skills are applied.

C. In the space program, all mission specialists should be engineers.

D. Young people should listen when adults tell them they cannot succeed.

16. Which line from the passage is **best** described as an opinion?

A. "I laughed and giggled all the way up."

* B. "Glenn could not have been in better hands."

C. "At that time, the only 'computers' were people."

D. "George Carruthers built his first telescope when he was 10."

READING OPEN-RESPONSE ITEM B

B. Guion Bluford and Vance Marchbanks have a common background experience which makes them especially suited to the space program. Identify this experience. Explain how past experiences make both of them good choices for their specific jobs at NASA. Use specific information from the passage to support your response.

RUBRIC FOR READING OPEN-RESPONSE ITEM B

SCORE	DESCRIPTION
4	The response identifies what Guion Bluford and Vance Marchbanks have in common. The response explains how their past experiences make both of them good choices for their specific jobs at NASA.
3	The response identifies what Guion Bluford and Vance Marchbanks have in common. The response explains how past experiences make one of them a good choice for his specific job at NASA.
2	The response identifies what Guion Bluford and Vance Marchbanks have in common. The response attempts to explain how past experiences make one of them a good choice for his specific job at NASA.
1	The response attempts to identify what Guion Bluford and Vance Marchbanks have in common. **OR** The response attempts to explain how past experiences make one of them a good choice for his specific job at NASA.
0	The response is totally incorrect or irrelevant. There is no evidence that the student understands the task, or the response may be off-topic.
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.)

Read the following passage. Then answer multiple-choice questions 17 through 24 and open-response question C.

Farmer Washington Plants a Nation

by Peggy Thomas

When George Washington wasn't busy leading rows of soldiers into battle, he was planting rows of fruit trees. While he was helping to invent a new form of government, he was also inventing new farm tools and equipment. Of all the jobs that George Washington had in his lifetime, being a farmer was his favorite. "It is true," he wrote, "that to be a cultivator of Land has been my favorite amusement."

And he knew that being a good farmer was just as important to the success of the new nation as being a good president. "In the present State of America our welfare and prosperity depend upon the cultivation of our lands and turning the produce of them to the best advantage." He believed that the improvements he made at his Mount Vernon farms would eventually benefit the nation.

Washington's farming practices were as revolutionary as his battle plans. He became one of the first American "scientific farmers," experimenting with seeds and soil and planting crops no one else had tried. He designed new barns and plows and was one of the first farmers to breed better mules in America.

Most landowners in the 1700s grew tobacco, but Washington soon realized that it was expensive to grow and ship to England, and it ruined the soil. Other planters would simply buy more land, but Washington believed that this was wasteful. Instead, he conserved his land by using fertilizer and rotating his crops.

While Washington was helping the colonies break away from England, he was also making his farm less dependent on British goods. By 1766, Washington was planting wheat and corn to be ground into flour, and he grew flax and cotton for cloth. He had built buildings to house shoemakers and weavers who made the clothing for all the slaves. Washington ordered his managers to "buy nothing you can make within yourselves." Eventually Mount Vernon also had its own carpenters, blacksmiths, and brickmakers.

Running America's "first farm" was not easy. Most of the time Washington had to manage his farms from far away. Every week he wrote lengthy letters to his farm managers, directing how much seed to sow and when to harvest. From his desk as first president of the United States, Washington even drew up plans for a revolutionary new threshing barn that had two stories and sixteen sides.

Seeing portraits of Washington in his starched white wig and elegant military uniform, it's hard to imagine him getting his hands dirty, but he enjoyed conducting experiments with manure and anything else that could be used as fertilizer. He knew that his crops were only as good as his soil. "Every experiment is a treasure," Washington wrote. He tried cow manure, sheep manure, and other types of dung. But he also used fish heads and plaster of Paris and had his men dredge mud from the bottom of the Potomac River to fertilize the soil.

On his farm he conducted experiments in a large wooden bin that was divided into three sections. In each section he mixed soil with a different type of fertilizer. Then he planted the same number of seeds in each compartment and recorded which seeds grew the fastest and produced the best plants.

He even built the first giant colonial

compost bin. It was located near the stables and was called a stercorary, or dung repository. Its sunken floor held the waste, while the long open sides let air flow in and out. Once it was built, Washington ordered his farm manager to "let others rake, and scrape up all the trash, of every sort and kind about the houses, and in the holes and corners, and throw it (all I mean that will make dung) into the Stercorary."

Nothing escaped Washington's notice. He kept daily records as well as a personal diary. He knew how many hoes, rakes, and shovels he owned, and even calculated how many bricks it would take to build his new threshing barn—30,820! When he saw a tool that did not work properly, he rolled up his sleeves and invented a new one. The ingenious barrel plow he designed performed three jobs in one. It neatly sliced a planting row through the soil, then dropped seeds from the barrel into the row. An attached harrow covered the seeds with soil.

Washington shared all of his best planting tips with his fellow farmers so that they, too, could help the nation grow. The year he died, 1799, he made the cover of the Citizen and Farmer's Almanac and was dubbed "Farmer Washington."

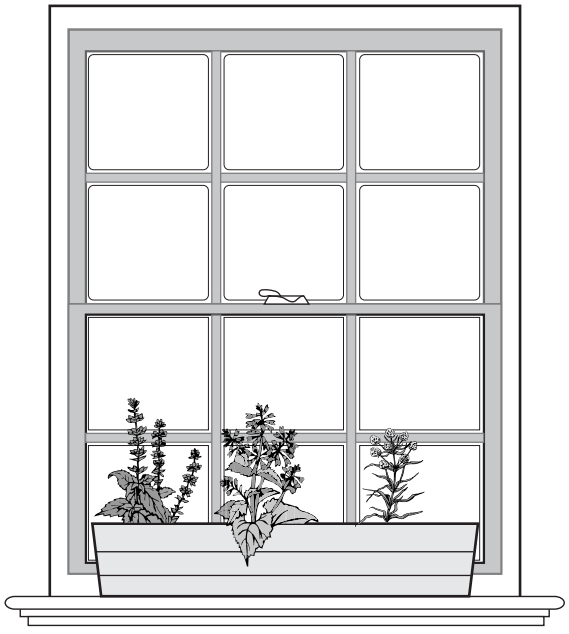
More than two hundred years ago George Washington wrote, "I hope, someday or another, we shall become a storehouse and granary for the world." And because of his ingenuity as a farmer and his leadership as the nation's first president, his wish came true. Today the United States is the world leader in agricultural production. Farmer Washington would be proud.

"Liberty,
when it begins to take root,
is a plant of rapid growth."

—GEORGE WASHINGTON

Winter Window Sill Gardening

When you think of winter, you may think of barren, snow-covered soil blanketing the delicious fruits of the earth from the past summer. Now you can extend the season of plenty by making an in-house window sill planter to provide flavorful herbs that will enhance meals throughout the year.



What You'll Need:

potting soil
container that will fit securely on window sill
seeds (basil, parsley, or other herbs of your choice bought new or saved from previous spring)

What to Do:

1. Place potting soil in container.
2. Make quarter-inch holes throughout the soil in the container and add seeds, then cover with soil.
3. Sprinkle water on the soil and place the container on a window sill (or in another bright place).
4. Label the container to indicate which seeds you've planted. Then watch them grow!

17. Why did Washington believe that his job as a farmer was as important as his job as president?

A. Presidential duties were less time-consuming than agricultural responsibilities.

B. Washington earned more money from farming than from his salary as president.

* C. Agricultural profits and presidential guidance contributed to the nation's welfare.

D. Political leaders and farmers were guaranteed the same rights by the government.

18. Based on the passage, which statement would be George Washington's message to modern American farmers?

A. When your fields stop producing, buy more land.

B. The best crops come from land free of fertilizer use.

C. The key to good farming is keeping your ground moist.

* D. Keep your soil healthy by using fertilizers and by rotating your crops.

19. As it is used in paragraph 10, what does <u>ingenious</u> mean?

* A. clever

B. useless

C. modern

D. dangerous

20. Which statement from the passage is an opinion?

A. "He knew that his crops were only as good as his soil."

B. "Most of the time Washington had to manage his farms from far away."

* C. "Washington's farming practices were as revolutionary as his battle plans."

D. "By 1766, Washington was planting wheat and corn to be ground into flour, and he grew flax and cotton for cloth."

21. What is the purpose of "Winter Window Sill Gardening"?

* A. to describe a method of indoor gardening

B. to persuade readers to grow plants indoors

C. to emphasize the importance of using herbs in cooking

D. to educate readers about the types of plants that can be grown indoors

22. According to the passage, why was farming important to the prosperity of the new nation?

A. Farming provided jobs for many people.

B. Farming caused the growth of a cheap labor force.

* C. Farming resulted in less reliance on foreign products.

D. Farming was an occupation in every state of the country.

23. While he was away from Mount Vernon, how did George Washington make sure the farm was being managed properly?

A. He hired agricultural experts to take care of the crops.

B. He depended on his neighbors to help with planting and harvesting.

* C. He wrote detailed letters instructing his managers how to tend the fields.

D. He rented his fields to sharecroppers until he could return to manage them himself.

24. In the introduction to "Winter Window Sill Gardening," the author uses the phrase "season of plenty." What does the author mean by this image?

A. bare landscape

* B. growing period

C. autumn celebrations

D. unproductive months

READING OPEN-RESPONSE ITEM C

C. George Washington invented the barrel plow. Describe how this farm tool was used. Explain how the invention improved life for farmers.

RUBRIC FOR READING OPEN-RESPONSE ITEM C

SCORE	DESCRIPTION
4	The response describes how the barrel plow was used by citing the three tasks it performed and explains, by providing a detailed reason, how the invention improved life for farmers.
3	The response describes how the barrel plow was used by citing the three tasks it performed and explains, by providing a general reason, how the invention improved life for farmers.
2	The response describes how the barrel plow was used by citing the three tasks it performed and attempts to explain how the invention improved life for farmers.
1	The response describes how the barrel plow was used by citing three, two, or one of the tasks it performed. **OR** The response attempts to explain how the invention improved life for farmers.
0	The response is totally incorrect or irrelevant. There is no evidence that the student understands the task, or the response may be off-topic.
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.)

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PART II Released Writing Prompts—2007 Benchmark Grade 8

PROMPT #1

Your social studies class has been discussing the power of the President of the United States. Your teacher has asked you to write an essay discussing what you would do if you could be President for one day.

Before you begin to write, think about being President. What would you do if you were the President for one day?

Now write an essay about what you would do if you could be the President for one day. Give specific details and examples. Explain your ideas clearly so that your teacher will understand.

PROMPT #2

As an assignment in your history class, your teacher has asked you to write an essay on the following topic:

What great event in the history of the world do you find the most interesting?

Before you begin to write, think about a great event in history. It might have been a scientific discovery, an invention that changed the world, or an idea that changed the way people think. Why is that event interesting to you?

Now write an essay for your history teacher about a great event in the history of the world that you find interesting. Be sure to name the event and give specific reasons you find it interesting. Give enough detail so that your teacher will understand.

WRITER'S CHECKLIST

1. Look at the ideas in your response.
   - — Have you focused on one main idea?
   - — Have you used enough detail to explain yourself?
   - — Have you put your thoughts in order?
   - — Can others understand what you are saying?
2. Think about what you want others to know and feel after reading your paper.
   - — Will others understand how you think or feel about an idea?
   - — Will others feel angry, sad, happy, surprised, or some other way about your response? (Hint: Make your reader feel like you do about your paper's subject.)
   - — Do you have sentences of different lengths? (Hint: Be sure you have a variety of sentence lengths.)
   - — Are your sentences alike? (Hint: Use different kinds of sentences.)
3. Look at the words you have used.
   - — Have you described things, places, and people the way they are? (Hint: Use enough detail.)
   - — Are you the same person all the way through your paper? (Hint: Check your verbs and pronouns.)
   - — Have you used the right words in the right places?
4. Look at your handwriting.
   - — Can others read your handwriting with no trouble?

Domain Scoring Rubric

Content (C)

The Content domain includes the focusing, structuring, and elaborating that a writer does to construct an effective message for a reader. It is the creation of a product, the building of a composition intended to be read. The writer crafts his/her message for the reader by focusing on a central idea, providing elaboration of the central idea, and delivering the central idea and its elaboration in an organized text. Features are:

- Central idea
- Elaboration
- Unity
- Organization

Style (S)

The Style domain comprises those features that show the writer purposefully shaping and controlling language to affect readers. This domain focuses on the vividness, specificity, and rhythm of the piece and the writer's attitude and presence. Features are:

- Selected vocabulary
- Sentence variety
- Tone
- Voice
- Selected information

Sentence Formation (F)

The Sentence Formation domain reflects the writer's ability to form competent, appropriately mature sentences to express his/her thoughts. Features are:

- Completeness
- Standard word order
- Absence of fused sentences
- Expansion through standard coordination and modifiers
- Embedding through standard subordination and modifiers

Usage (U)

The Usage domain comprises the writer's use of word-level features that cause written language to be acceptable and effective for standard discourse. Features are:

- Standard inflections
- Agreement
- Word meaning
- Conventions

Mechanics (M)

The Mechanics domain includes the system of symbols and cueing devices a writer uses to help readers make meaning. Features are:

- Capitalization
- Punctuation
- Formatting
- Spelling

Scoring Scale

Each domain is scored independently using the following scale:

4 = The writer demonstrates **consistent**, though not necessarily perfect, control* of almost all of the domain's features.
3 = The writer demonstrates **reasonable**, but not consistent, control* of most of the domain's features, indicating some weakness in the domain.
2 = The writer demonstrates **inconsistent** control* of several of the domain's features, indicating significant weakness in the domain.
1 = The writer demonstrates **little** or **no** control* of most of the domain's features.

*Control: The ability to use a given feature of written language effectively at the appropriate grade level. A response receives a higher score to the extent that it demonstrates control of the features in each domain.

The application of the scale, using actual student writing, is done with the assistance of a committee of Arkansas teachers, language arts supervisors, and representatives of the Arkansas Department of Education.

Non-scoreable and Blank Papers

Compositions are scored, unless they are off-topic, illegible, incoherent, refusals to respond, written in a language other than English, or too brief to assess. A score of "NA" indicates that the student's writing entry was non-scoreable, and that entry will receive a score of "0."

1. Which of the following correctly uses commas?

* A. We addressed our letter to the president at The White House, 1600 Pennsylvania Avenue, Washington, D.C.

B. We addressed our letter to the president at The White House 1600 Pennsylvania Avenue, Washington, D.C.

C. We addressed our letter to the president at The White House, 1600, Pennsylvania Avenue, Washington, D.C.

D. We addressed our letter to the president at The White House, 1600 Pennsylvania Avenue, Washington D.C.

2. **Mark ran so slow that we knowed something was wrong with him.**

Which is the **best** revision of the sentence above?

A. Mark ran so slow that we knew something was wrong with him.

B. Mark ran so slowly that we know something was wrong with him.

* C. Mark ran so slowly that we knew something was wrong with him.

D. Mark ran so slowly that we knowed something was wrong with him.

3. **The alert salesclerk called the security guard.**

The sentence above is an example of which sentence pattern?

A. S-V

* B. S-V-DO

C. S-V-IO-DO

D. S-LV-PA

4. **The Arkansas state quarter was the 25th quarter in the 50 State Quarters Program.**

The sentence above is a topic sentence for a report. Which is the **best** detail to include in the report?

A. The first quarter issued was Delaware.

B. The last two quarters, Alaska and Hawaii, will not be issued until 2008.

C. State quarters are issued in the order in which the states joined the Union.

* D. The design of the Arkansas quarter includes a diamond, a rice stalk, and a mallard flying over a lake.

5. Which of the following is the **best** topic sentence to use for a report on Arkansas Post, Arkansas?

A. I bet you do not know very much about Arkansas Post, Arkansas.

B. In this report, I will describe the history of Arkansas Post, Arkansas.

C. In 1821, the capital of Arkansas was moved from Arkansas Post to Little Rock, on the Arkansas River.

* D. Arkansas Post, Arkansas, is an important place in Arkansas's state history.

6. **The students developed an idea for a spring festival ___ the principal approved it.**

Which punctuation **best** completes the sentence above?

A. colon

B. comma

* C. semicolon

D. exclamation point

7. Which of the following is a compound sentence?

A. Butterflies love brightly colored flowers.

B. Bumblebees must replenish energy levels hummingbirds must replenish as well.

C. Hummingbirds and butterflies are fond of brightly colored flowers: bees just need nectar.

* D. Flowers that offer a cup-like shape attract hummingbirds, but bumblebees do not find them as appealing.

8. Which of the following is a simple sentence?

* A. Mornings are often quiet and peaceful.

B. While I was biking on the trail, I saw a turtle.

C. Daily exercise is important, and you should do it.

D. I hurt my leg while exercising in the morning.

PART III Item Correlation with Curriculum Frameworks—2007 Benchmark Grade 8

The Arkansas *Mathematics Curriculum Framework**

Strands	Content Standards	Student Learning Expectations
1—NUMBER AND OPERATIONS (NO)	1. Number Sense: Students shall understand numbers, ways of representing numbers, relationships among numbers, and number systems.	1. Read, write, compare, and solve problems, with and without appropriate technology, including numbers less than 1 in scientific notation. 3. Compare and order real numbers, including irrational numbers, and find their approximate location on a number line (use technology when appropriate).
	2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another.	1. Apply the addition, subtraction, multiplication, and division properties of equality to two-step equations. 4. Apply rules (conventions) for order of operations to rational numbers. 5. Model and develop addition, subtraction, multiplication, and division of rational numbers. Ex. (–8½ + 2¾)
	3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.	4. Apply factorization to find LCM and GCF of algebraic expressions. (Ex. $4x^2y^3$, $6xy^2$, GCF = $2xy^2$, LCM = $12x^2y^3$) 6. Solve, with and without technology, real-world percent problems, including percent of increase or decrease.
2—ALGEBRA (A)	4. Patterns, Relations, and Functions: Students shall recognize, describe, and develop patterns, relations, and functions.	1. Find the *n*th term in a pattern or a function table. 2. Using real-world situations, describe patterns in words, tables, pictures, and symbolic representations. 4. Use tables, graphs, and equations to identify independent and dependent variables (input/output).
	5. Algebraic Representations: Students shall represent and analyze mathematical situations and structures, using algebraic symbols.	1. Solve and graph two-step equations and inequalities with one variable, and verify the reasonableness of the result with real-world application, with and without appropriate technology. 4. Write and evaluate algebraic expressions using rational numbers.
	6. Algebraic Models: Students shall develop and apply mathematical models to represent and understand quantitative relationships.	1. Describe, with and without appropriate technology, the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change (rise/run) and *y*-intercept in real-world problems. 3. Differentiate between independent and dependent variables, given a linear relationship in context. 4. Represent, with and without appropriate technology, simple exponential and/or quadratic functions, using verbal descriptions, tables, graphs, and formulas, and translate among these representations.
3—GEOMETRY (G)	8. Geometric Properties: Students shall analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.	3. Determine appropriate application of geometric ideas and relationships such as congruence, similarity, and the Pythagorean theorem, with and without appropriate technology.
	9. Transformation of Shapes: Students shall apply transformations and the use of symmetry to analyze mathematical situations.	1. Determine a transformation's line of symmetry and compare the properties of the figure and its transformation. 2. Draw the results of translations and reflections about the *x*- and *y*-axis and rotations of objects about the origin.
	10. Coordinate Geometry: Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.	1. Use coordinate geometry to explore the links between geometric and algebraic representations of problems (lengths of segments/distance between points, slope/perpendicular-parallel lines).
	11. Visualization and Geometric Models: Students shall use visualization, spatial reasoning, and geometric modeling.	1. Using isometric dot paper, interpret and draw different views of buildings.

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

The Arkansas *Mathematics Curriculum Framework** (continued)

Strands	Content Standards	Student Learning Expectations
4—MEASUREMENT (M)	12. Physical Attributes: Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects.	1. Understand, select, and use, with and without appropriate technology, the appropriate units and tools to measure angles, perimeter, area, surface area, and volume to solve real-world problems. 2. Describe and apply equivalent measures using a variety of units within the same system of measurement.
	13. Systems of Measurement: Students shall identify and use units, systems, and processes of measurement.	1. Draw and apply measurement skills with fluency to appropriate levels of precision. 2. Solve problems involving volume and surface area of pyramids, cones, and composite figures, with and without appropriate technology. 3. Apply proportional reasoning to solve problems involving indirect measurements, scale drawings, or rates. 4. Find the distance between two points on a coordinate plane using the Pythagorean theorem. 5. Estimate and compute the area of irregular two-dimensional shapes.
5—DATA ANALYSIS AND PROBABILITY (DAP)	14. Data Representation: Students shall formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.	2. Explain which types of display are appropriate for various data sets (scatter plot for relationship between two variants and line of best fit). 3. Interpret or solve real-world problems using data from charts, line plots, stem-and-leaf plots, double-bar graphs, line graphs, box-and-whisker plots, scatter plots, frequency tables, or double line graphs.
	15. Data Analysis: Students shall select and use appropriate statistical methods to analyze data.	3. Given at least one of the measures of central tendency, create a data set. 4. Describe how the inclusion of outliers affects those measures.
	17. Probability: Students shall understand and apply basic concepts of probability.	1. Compute, with and without appropriate technology, probabilities of compound events, using organized lists, tree diagrams, and logic grids. 2. Make predictions based on theoretical probabilities, design and conduct an experiment to test the predictions, compare actual results to predicted results, and explain differences. (Ex. suggested materials for simulations are: polyhedra die, random number table, and technology.)

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

PART III Item Correlation with Curriculum Frameworks—2007 Benchmark Grade 8

Released Items for Mathematics*

Strands	Content Standards
1— NUMBERS AND OPERATIONS (NO)	1. Number Sense: Students shall understand numbers, ways of representing numbers, relationships among numbers, and number systems. 2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another. 3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.
2— ALGEBRA (A)	4. Patterns, Relations, and Functions: Students shall recognize, describe, and develop patterns, relations, and functions. 5. Algebraic Representations: Students shall represent and analyze mathematical situations and structures, using algebraic symbols. 6. Algebraic Models: Students shall develop and apply mathematical models to represent and understand quantitative relationships.
3— GEOMETRY (G)	8. Geometric Properties: Students shall analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships. 9. Transformation of Shapes: Students shall apply transformations and the use of symmetry to analyze mathematical situations. 10. Coordinate Geometry: Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems. 11. Visualization and Geometric Models: Students shall use visualization, spatial reasoning, and geometric modeling.
4— MEASUREMENT (M)	12. Physical Attributes: Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects. 13. Systems of Measurement: Students shall identify and use units, systems, and processes of measurement.
5— DATA ANALYSIS AND PROBABILITY (DAP)	14. Data Representation: Students shall formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them. 15. Data Analysis: Students shall select and use appropriate statistical methods to analyze data. 17. Probability: Students shall understand and apply basic concepts of probability.

Item	Strand	Content Standard	Student Learning Expectation
1	G	8	3
2	DAP	14	3
3	DAP	14	2
4	NO	1	1
5	A	6	3
6	M	13	1
7	M	12	1
8	NO	2	1
9	A	4	2
10	M	12	2
11	DAP	15	3
12	G	8	3
13	NO	2	4
14	A	4	4
15	A	5	1
16	DAP	14	3
17	NO	2	5
18	M	12	1
19	G	8	3
20	NO	2	1
21	M	13	3
22	A	5	4
23	M	12	2

Item	Strand	Content Standard	Student Learning Expectation
24	DAP	17	2
25	NO	3	6
26	A	6	1
27	M	12	1
28	NO	1	3
29	A	6	4
30	DAP	15	4
31	DAP	17	1
32	G	11	1
33	G	9	2
34	M	13	1
35	M	13	5
36	M	13	4
37	NO	3	4
38	G	10	1
39	DAP	17	1
40	A	6	3
A	A	4	1
B	DAP	14	3
C	G	9	1
D	M	13	2
E	NO	1	3

*Only the predominant Strand, Content Standard, and Student Learning Expectation is listed.

PART III Item Correlation with Curriculum Frameworks—2007 Benchmark Grade 8

The Arkansas *English Language Arts Curriculum Framework—Reading Strand**

Content Standards	Student Learning Expectations
9. Comprehension: Students shall apply a variety of strategies to read and comprehend printed material.	1. Use previewing, activating prior knowledge, predicting content of text, formulating questions, and establishing purposes for reading. 2. Evaluate the interrelations of text and world issues/events by applying connection strategies. 3. Connect, compare, and contrast ideas, themes, and issues across texts. 4. Defend questions formulated and purposes established for reading. 5. Generate and define questions related to universal themes to interpret meaning. 8. Infer a character's role in development of plot and theme. 9. Infer mood and theme of text. 10. Use literary elements and historical context to infer author's intent. 11. Analyze the literary elements of plot, subplot, and climax, and explain the way in which conflicts are resolved or unresolved. 12. Compare and contrast points of view such as first person, limited, and omniscient third person, and explain the effect on the overall theme of a literary work. 13. Distinguish among stated fact, reasoned judgment, and opinion in text. 15. Identify main ideas and supporting evidence in short stories and novels. 16. Use the text features to locate and recall information with emphasis on text organizers. 18. Organize information, including simple outlining. 21. Evaluate conflicts, motivations, points of view, and changes that affect the plot or theme. 22. Evaluate personal, social, and political issues as presented in text.
11. Vocabulary, Word Study, and Fluency: Students shall acquire and apply skills in vocabulary development and word analysis to be able to read fluently.	8. Identify and explain similes, metaphors, personification, hyperboles, and analogies to infer the literal and figurative meanings of phrases. 10. Use context, structure, denotations, and connotations to determine meaning of words and phrases.

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

Released Items for Reading*

Item	Content Standard	Student Learning Expectation	Passage Type
1	9	11	Literary
2	9	3	Literary
3	9	15	Literary
4	9	21	Literary
5	9	11	Literary
6	9	21	Literary
7	9	12	Literary
8	11	10	Literary
A	9	15	Literary
9	9	18	Content
10	9	16	Content
11	11	8	Content
12	9	9	Content
13	9	5	Content
14	9	1	Content
15	9	15	Content
16	9	13	Content
B	9	8	Content
17	9	22	Practical
18	9	2	Practical
19	11	10	Practical
20	9	13	Practical
21	9	4	Practical
22	9	10	Practical
23	9	15	Practical
24	11	8	Practical
C	9	15	Practical

*Only the predominant Strand, Content Standard, and Student Learning Expectation is listed.

PART III Item Correlation with Curriculum Frameworks—2007 Benchmark Grade 8

The Arkansas *English Language Arts Curriculum Framework—Writing Strand**

Content Standards	Student Learning Expectations
4. Process: Students shall employ a wide range of strategies as they write and use different writing process elements appropriately.	7. Revise content for: • Central idea • Organization • Unity • Elaboration • Clarity 10. Edit individually, or in groups, for appropriate grade-level conventions within the following features. • Sentence formation – Completeness – Absence of fused sentences – Expansion through standard coordination and modifiers – Embedding through standard subordination and modifiers – Standard word order • Usage – Standard inflections – Agreement – Word meaning – Conventions • Mechanics – Capitalization – Punctuation – Formatting – Spelling
6. Conventions: Students shall apply knowledge of Standard English conventions in written work.	6. Apply conventions of grammar with emphasis on the following: • Subject-verb agreement • Parts of speech • Pronoun and antecedent agreement • Parts of a sentence and sentence patterns – S-V – S-V-DO – S-V-IO-DO – S-LV-PN – S-LV-PA • Conjugation in regular, progressive, and emphatic verb forms • Verbals 9. Apply conventional rules of punctuation in writing.

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

PART III Item Correlation with Curriculum Frameworks—2007 Benchmark Grade 8

The Arkansas *English Language Arts Curriculum Framework*—Writing Strand* (continued)

Content Standards	Student Learning Expectations
6. Conventions: Students shall apply knowledge of Standard English conventions in written work. continued	10. Edit own and peer papers with emphasis on: • All end marks • Commas • Dash • Hyphen • Quotation marks – Double – Single • Parentheses • Semicolons • Colons
7. Craftsmanship: Students shall develop personal style and voice as they approach the craftsmanship of writing.	2. Use a variety of sentence types and lengths (see Conventions Standard 6).

Released Items for Writing*

Item	Content Standard	Student Learning Expectation
1	6	9
2	4	10
3	6	6
4	4	7
5	4	7
6	6	10
7	7	2
8	7	2

*Only the predominant Strand, Content Standard, and Student Learning Expectation is listed.

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