

Georgia Milestones

Assessment System



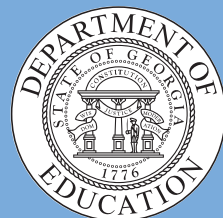
Assessment Guide

Grade 6

MATH ONLY



Assessment Guide



MATHEMATICS

DESCRIPTION OF TEST FORMAT AND ORGANIZATION

The Georgia Milestones Mathematics EOG assessment is primarily a criterion-referenced test, designed to provide information about how well a student has mastered the grade-level state-adopted content standards in Mathematics. Each student will receive one of four Achievement Level designations, depending on how well the student has mastered the content standards. The four Achievement Level designations are Beginning Learner, Developing Learner, Proficient Learner, and Distinguished Learner. In addition to criterion-referenced information, the Georgia Milestones measures will also include a limited sample of nationally norm-referenced items to provide a signal of how Georgia students are achieving relative to their peers nationally. The norm-referenced information provided is supplementary to the criterion-referenced Achievement Level designation and will not be utilized in any manner other than to serve as a barometer of national comparison. Only the criterion-referenced scores and Achievement Level designations will be utilized in the accountability metrics associated with the assessment program (such as student growth measures, educator-effectiveness measures, or the CCRPI).

The Grade 6 Mathematics EOG assessment consists of a total of 73 items, 64 of which are operational items (and contribute to a student's criterion-referenced and/or norm-referenced score) and 9 of which are field test items (newly written items that are being tried out and do not contribute to the student's score). The criterion-referenced score, and Achievement Level designation, is comprised of 53 items, for a total of 58 points. Students will respond to a variety of item types, including selected-response, constructed-response, and extended constructed-response items. Of the 64 operational items, 20 will be norm-referenced and will provide a national comparison in the form of a national percentile rank. Nine of the items have been verified as aligned to the course content standards by Georgia educators and will therefore contribute to the criterion-referenced Achievement Level designation. The other 11 items will contribute only to the national percentile rank and be provided as supplemental information. Only items that are aligned to the state-adopted content standards will be utilized to inform the criterion-referenced score.

With the inclusion of the norm-referenced items, students may encounter items for which they have not received direct instruction. These items will not contribute to the students' criterion-referenced Achievement Level designation; only items that align to the course content standards will contribute to the criterion-referenced score. Students should be instructed to try their best should they ask about an item that is not aligned to the content they have learned as part of the course.

Grade 6 Mathematics EOG Assessment Design

Description	Number of Items	Points for CR ¹ Score	Points for NRT ² Feedback
CR Selected-Response Items	41	41	0
NRT Selected-Response Items	20 ³	9 ⁴	20
CR Constructed-Response Items	2	4	0
CR Extended Constructed-Response Items	1	4	0
CR Field Test Items	9	0	0
Total Items/Points⁵	73	58	20

¹CR—Criterion-Referenced: items aligned to state-adopted content standards

²NRT—Norm-Referenced Test: items that will yield a national comparison; may or may not be aligned to state-adopted content standards

³Of these items, 9 will contribute to both the CR scores and NRT feedback. The other 11 of these items will contribute to NRT feedback only and will not impact the student's Achievement Level designation, scale score, or grade conversion.

⁴Alignment of national NRT items to course content standards was verified by a committee of Georgia educators. Only approved, aligned NRT items will contribute to a student's CR Achievement Level designation, scale score, and grade conversion score.

⁵Total number of items contributing to CR score: 53; total points: 58; total number of items contributing to NRT feedback: 20; total points: 20

The test will be given in two sections. Section 1 is divided into two parts. Students may have up to 85 minutes per section to complete Sections 1 and 2. The total estimated testing time for the Grade 6 Mathematics EOG assessment ranges from approximately 120 to 170 minutes. Total testing time describes the amount of time students have to complete the assessment. It does not take into account the time required for the test examiner to complete pre-administration and post-administration activities (such as reading the standardized directions to students). Sections 1 and 2 must be scheduled to be administered on the same day in one test session following the district's testing protocols for the EOG measures (in keeping with state guidance).

During the Mathematics EOG assessment, a formula sheet will be available for students to use. There is an example of the formula sheet in the Mathematics Additional Sample Items section of this guide. Another feature of the Grade 6 Mathematics EOG assessment is that students may use a basic function calculator in Part 1 of Section 1 and in all of Section 2.

CONTENT MEASURED

The Grade 6 Mathematics assessment will measure the Grade 6 standards that are described at www.georgiastandards.org.

The content of the assessment is organized into five groupings, or domains, of standards for the purposes of providing feedback on student performance. A content domain is a reporting category that *broadly* describes and defines the content of the course, as measured by the EOG assessment. The standards for Grade 6 Mathematics

are grouped into five domains: Ratios and Proportional Relationships, The Number System, Expressions and Equations, Geometry, and Statistics and Probability. Each domain was created by organizing standards that share similar content characteristics. The content standards describe the level of expertise that Grade 6 Mathematics educators should strive to develop in their students. Educators should refer to the content standards for a full understanding of the knowledge, concepts, and skills subject to be assessed on the EOG assessment.

The approximate proportional number of points associated with each domain is shown in the following table. A range of cognitive levels will be represented on the Grade 6 Mathematics EOG assessment. Educators should always use the content standards when planning instruction.

GRADE 6 MATHEMATICS: DOMAIN STRUCTURES AND CONTENT WEIGHTS

Domain	Standard	Approximate Weight
Ratios and Proportional Relationships	MGSE6.RP.1 MGSE6.RP.2 MGSE6.RP.3	12%
The Number System	MGSE6.NS.1 MGSE6.NS.5 MGSE6.NS.2 MGSE6.NS.6 MGSE6.NS.3 MGSE6.NS.7 MGSE6.NS.4 MGSE6.NS.8	30%
Expressions and Equations	MGSE6.EE.1 MGSE6.EE.6 MGSE6.EE.2 MGSE6.EE.7 MGSE6.EE.3 MGSE6.EE.8 MGSE6.EE.4 MGSE6.EE.9 MGSE6.EE.5	23%
Geometry	MGSE6.G.1 MGSE6.G.2 MGSE6.G.3 MGSE6.G.4	18%
Statistics and Probability	MGSE6.SP.1 MGSE6.SP.4 MGSE6.SP.2 MGSE6.SP.5 MGSE6.SP.3	17%

ITEM TYPES

The Mathematics portion of the Grade 6 EOG assessment consists of selected-response, constructed-response, and extended constructed-response items.

A selected-response item, sometimes called a multiple-choice item, is defined as a question, problem, or statement that appears on a test followed by several answer choices, sometimes called options or response choices. The incorrect choices, called distractors, usually reflect common errors. The student's task is to choose, from the alternatives provided, the best answer to the question posed in the stem (the question). The Mathematics selected-response items will have four answer choices.

A constructed-response item asks a question and solicits the student to provide a response he or she constructs on his or her own, as opposed to selecting from options provided. The constructed-response items on the EOG assessment will be worth two points. Partial credit may be awarded if part of the response is correct.

An extended constructed-response item is a specific type of constructed-response item that elicits a longer, more detailed response from the student than a two-point constructed-response item. The extended constructed-response items on the EOG assessment will be worth four points. Partial credit may be awarded if part of the response is correct.

MATHEMATICS DEPTH OF KNOWLEDGE EXAMPLE ITEMS

Example items that represent the applicable DOK levels across various Grade 6 Mathematics content domains are provided.

All example and sample items contained in this guide are the property of the Georgia Department of Education.

Example Item 1

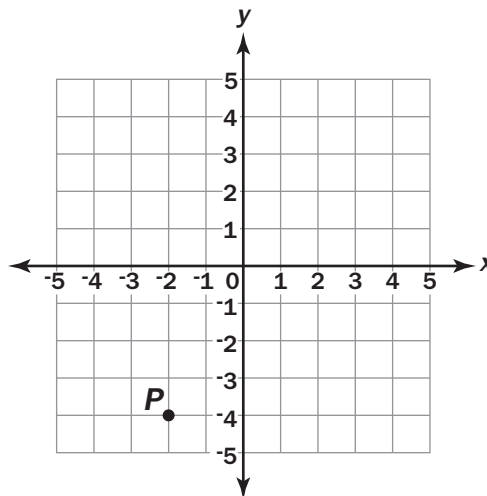
DOK Level 1:

Mathematics Grade 6 Content Domain: The Number System

Standard: MGSE6.NS.6. Understand a rational number as a point on the number line.

Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

Look at point P on the coordinate grid.



What are the coordinates of point P ?

- A. (2, 4)
- B. (4, 2)
- C. (-2, -4)
- D. (-4, -2)

Correct Answer: C

Explanation of Correct Answer: The correct answer is choice (C) (-2, -4). Point P is located 2 units to the left of the origin, which gives us a value of -2 for x , and 4 units down, which gives us a value of -4 for y . Choice (A) is incorrect because the signs of the numbers are ignored. Choice (B) is incorrect because the coordinates are interchanged and the signs are ignored. Choice (D) is incorrect because it interchanges the coordinates.

Example Item 2**DOK Level 2:****Mathematics Grade 6 Content Domain:** Ratios and Proportional Relationships

Standard: MGSE6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems utilizing strategies such as tables of equivalent ratios, tape diagrams (bar models), double number line diagrams, and/or equations. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

John orders 25 prints from a photo store for \$13.00.

What is the cost per print?

- A. \$0.12
- B. \$0.38
- C. \$0.52
- D. \$1.92

Correct Answer: C

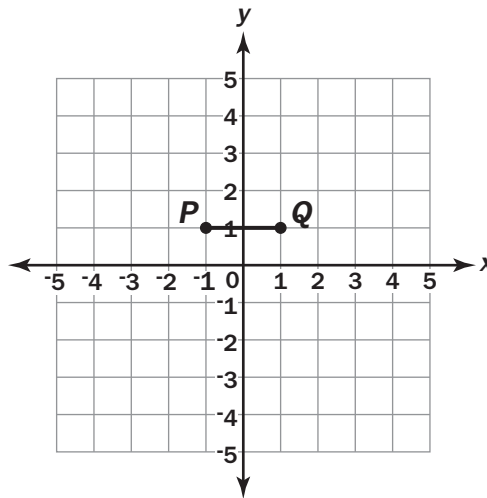
Explanation of Correct Answer: The correct answer is choice (C) \$0.52. The cost per print is equal to the total cost divided by the number of prints: $\frac{\$13.00}{25} = \0.52 .

Choice (A) is incorrect because it is the result of subtracting 0.13 from 0.25. Choice (B) is incorrect because it is the result of adding 0.13 and 0.25. Choice (D) is incorrect because it is the result of dividing 25 by 13.

Example Item 3**DOK Level 3:****Mathematics Grade 6 Content Domain:** Geometry

Standard: MGSE6.G.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Harry is drawing trapezoid $PQRS$. He plots vertices P and Q on the coordinate grid as shown.



Harry wants the trapezoid to have a height of 3 units.

Which of these could be the coordinates of vertices R and S of trapezoid $PQRS$?

- A. $R(2, 3)$ and $S(-3, 3)$
- B. $R(3, -3)$ and $S(-4, -3)$
- C. $R(4, -2)$ and $S(-2, -2)$
- D. $R(-2, 4)$ and $S(2, 2)$

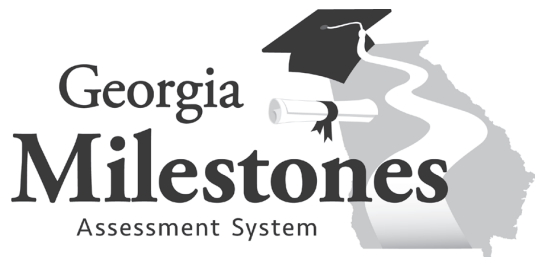
Correct Answer: C

Explanation of Correct Answer: The correct answer is choice (C) $R(4, -2)$ and $S(-2, -2)$. The given coordinates form a trapezoid. From -2 to 1 on the y -axis is a height of 3 units. While choices (A) and (B) do give coordinates that form trapezoids, the heights are not 3 units. In choice (A), the height is 2 units. In choice (B), the height is 4 units. Choice (D) is incorrect because the given coordinates do not form a trapezoid.

MATHEMATICS ADDITIONAL SAMPLE ITEMS

This section has two parts. The first part is a set of 10 sample items for the Mathematics portion of the EOG assessment. The second part contains a table that shows for each item the standard assessed, the DOK level, the correct answer (key), and a rationale/explanation about the key and distractors. The sample items can be utilized as a mini-test to familiarize students with the item formats found on the assessment.

All example and sample items contained in this guide are the property of the Georgia Department of Education.



Mathematics Formula Sheet

You can find mathematics formula sheets on the Georgia Milestones webpage at <http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Assessment/Pages/Georgia-Milestones-Assessment-System.aspx>.

Look under “EOG Resources.”

Item 1

Look at the expression.

$$25 + 45$$

Which of these is an equivalent expression?

- A. $5(5 + 45)$
- B. $5(5 + 9)$
- C. $5(20 + 40)$
- D. $5(25 + 9)$

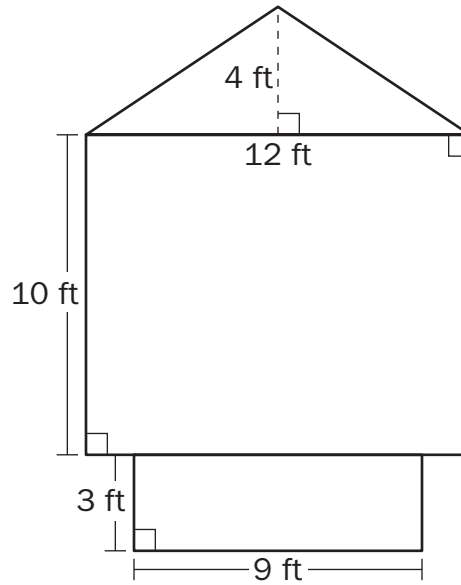
Item 2

Which inequality is true and why?

- A. $-1 > -4$ because -1 is to the right of -4 on a horizontal number line oriented left to right
- B. $-4 > -5$ because -4 is to the left of -5 on a horizontal number line oriented left to right
- C. $-8 > -7$ because -8 is to the right of -7 on a horizontal number line oriented left to right
- D. $-9 > -6$ because -9 is to the left of -6 on a horizontal number line oriented left to right

Item 3

Look at the figure.



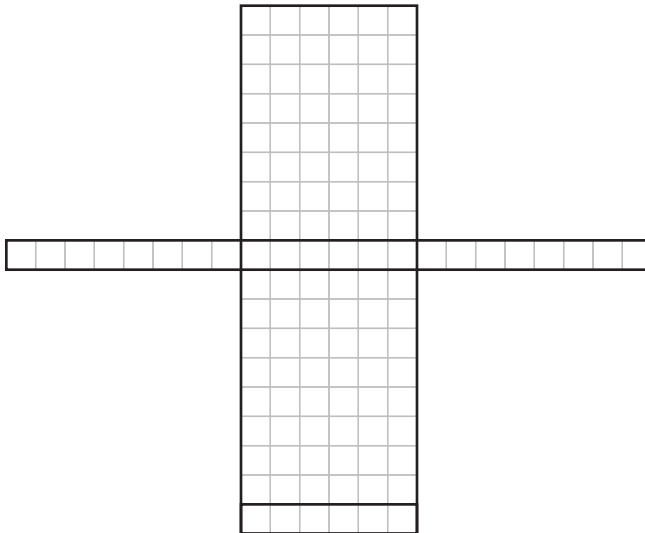
What is the total area of this figure?

- A. 141 ft^2
- B. 171 ft^2
- C. 180 ft^2
- D. 195 ft^2

Item 4

Faye made a case for her electronic reading device using the net shown.

Faye's Case



KEY

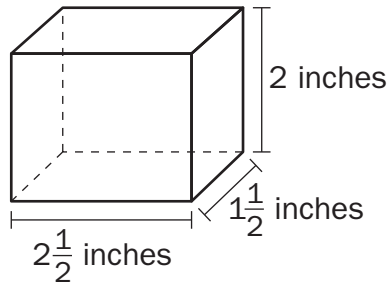
= 1 square inch

What is the total surface area, in square inches, of Faye's case?

- A. 62
- B. 96
- C. 108
- D. 124

Item 5

Look at the box in the shape of a right rectangular prism.



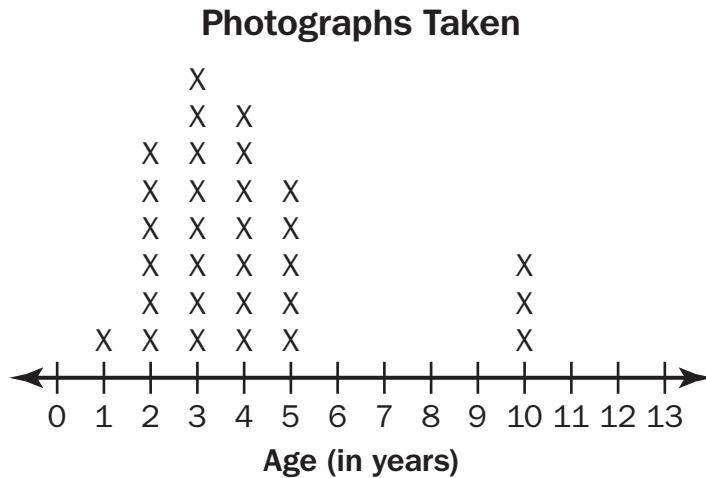
Lorraine plans to fill this box with cubes of the same size. Each cube has side lengths of $\frac{1}{2}$ inch.

How many cubes can fit inside this box without empty space?

- A. 4
- B. 5
- C. 32
- D. 60

Item 6

The line plot shows the ages of the children who had their photographs taken at a photography studio during a certain week.



Which statement about the children who had their photographs taken does the spread of the data describe?

- A. The average age of the children was 3 years.
- B. The most common age of the children was 10 years.
- C. The ages of half of the children were 6 years or less.
- D. The ages of the children ranged from 1 year to 10 years.

Item 7

Look at the inequality.

$$3y > 27$$

Which set of values for y will make this inequality true?

- A. 4, 5, 8
- B. 5, 7, 9
- C. 9, 12, 14
- D. 11, 13, 22

MATHEMATICS ADDITIONAL SAMPLE ITEM KEYS

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
1	MGSE6.NS.4	2	B	The correct answer is choice (B) $5(5 + 9)$. A common factor of 25 and 45 is 5. $\frac{25}{5} = 5$ and $\frac{45}{5} = 9$. So, $25 + 45 = 5(5 + 9)$. Choices (A) and (D) are incorrect because they only factor one of the two terms. Choice (C) is incorrect because it is the result of subtracting 5 from each term instead of dividing by 5.
2	MGSE6.NS.7a	2	A	The correct answer is choice (A) $-1 > -4$ because -1 is to the right of -4 on a horizontal number line oriented left to right. Numbers increase in value moving from left to right along the number line. Since -1 is to the right of -4 on the number line, $-1 > -4$. Choices (B), (C), and (D) are incorrect because the location of the numbers was confused, the sign of the numbers was not considered, and the relative positions of the numbers on the number line was misstated.
3	MGSE6.G.1	2	B	The correct answer is choice (B) 171 ft^2 . The area of the smaller rectangle is $3 \times 9 = 27$ square feet. The area of the larger rectangle is $10 \times 12 = 120$ square feet. The area of the triangle is $\left(\frac{1}{2}\right)(12 \times 4) = 24$ square feet. The total area is $27 + 120 + 24 = 171$ square feet. Choice (A) is incorrect because it uses a width of 9 feet for the larger rectangle instead of 12 feet. Choice (C) is incorrect because it combines the two rectangles into one rectangle with dimensions 12 feet by 13 feet. Choice (D) is incorrect because it uses 4×12 as the area of the triangle instead of $\left(\frac{1}{2}\right)(12 \times 4)$.
4	MGSE6.G.4	2	D	The correct answer is choice (D) 124. The net is comprised of two rectangles each measuring 8×6 inches, two rectangles each measuring 1×8 inches, and two rectangles each measuring 1×6 inches. The total area is $2(8 \times 6) + 2(1 \times 8) + 2(1 \times 6) = 124$ square inches. Choices (A), (B), and (C) are incorrect because they do not include all of the faces of the net.

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
5	MGSE6.G.2	2	D	The correct answer is choice (D) 60. Along the length of the box, 5 cubes will fit. Along the width, 3 cubes will fit. Therefore, 15 cubes will fill the base. The box will hold 4 layers of cubes. That makes the total number of cubes 60. Choices (A) and (B) are incorrect because they are based on the base holding 2×1 cubes and there being only 2 layers of cubes. Choice (B) then adds 1 more cube to account for the $\frac{1}{2}$ in the given length and width of the box. Choice (C) is incorrect because it is based on the box holding 4×2 cubes in the base or 32 cubes instead of 15.
6	MGSE6.SP.2	1	D	The correct answer is choice (D) The ages of the children ranged from 1 year to 10 years. The least number on the number line with Xs above it is 1. The greatest number on the number line with Xs above it is 10. The data values range from 1 to 10. Choices (A) and (B) are incorrect because they are statements about measures of center instead of a measure of spread. Choice (C) is incorrect because it assumes the spread of the data is the number of ages with Xs above them.
7	MGSE6.EE.5	2	D	The correct answer is choice (D) 11, 13, 22. The values of y that will make the inequality true are the values of y for which $3y$ is greater than 27. $3(11) = 33$; $3(13) = 39$; $3(22) = 66$. Choices (A) and (B) are incorrect because at least one value of y makes $3y$ less than 27. Choice (C) is incorrect because when y is 9, $3y$ is equal to 27.
8	MGSE6.EE.6	2	B	The correct answer is (B) $5x + 25$. Harriet starts with \$25, so the expression must have a value of 25 when $x = 0$. Each week, Harriet adds \$5, so the rate of change is \$5 per week. Choice (A) is incorrect because it interchanges the starting amount with the amount added each week. Choices (C) and (D) use the distributive property incorrectly for this situation.
9	MGSE6.NS.1	2	N/A	See scoring rubric and exemplar responses beginning on page 68.
10	MGSE6.RP.3b	3	N/A	See scoring rubric and exemplar responses beginning on page 69.

MATHEMATICS EXAMPLE SCORING RUBRICS AND EXEMPLAR RESPONSES

Item 9

Scoring Rubric

Points	Description
2	<p>The response achieves the following:</p> <ul style="list-style-type: none"> The response demonstrates a complete understanding of interpreting and computing quotients of fractions and solving word problems involving division of fractions by fractions. Give 2 points for a correct process AND the correct answer. <ul style="list-style-type: none"> Response is correct and complete. Response shows application of a reasonable and relevant strategy. Mathematical ideas are expressed coherently through a complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate.
1	<p>The response achieves the following:</p> <ul style="list-style-type: none"> The response demonstrates a partial understanding of interpreting and computing quotients of fractions and solving word problems involving division of fractions by fractions. Give 1 point for a correct process OR a correct answer with no work shown. <ul style="list-style-type: none"> Response is only partially correct. Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained. Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate.
0	<p>The response achieves the following:</p> <ul style="list-style-type: none"> The response demonstrates no understanding of interpreting and computing quotients of fractions and solving word problems involving division of fractions by fractions. <ul style="list-style-type: none"> Response shows no application of a strategy or application of an irrelevant strategy. Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding.

Exemplar Response

Points Awarded	Sample Response
2	$\frac{2}{3} \div \frac{1}{6} = \frac{2}{3} \times \frac{2}{1} = \frac{4}{3} = 1\frac{1}{3}$ <p>4 batches</p>
1	4 batches
0	Response is irrelevant, inappropriate, or not provided.

Item 10

Scoring Rubric

Points	Description
4	<p>The response achieves the following:</p> <ul style="list-style-type: none"> • The response demonstrates a complete understanding of using ratio and rate reasoning to solve real-world and mathematical problems. • Give 4 points for Part A and Part B and Part C completely correct. <ul style="list-style-type: none"> • Response is correct and complete. • Response shows application of a reasonable and relevant strategy. • Mathematical ideas are expressed coherently through a clear, complete, logical, and fully developed response using words, calculations, and/or symbols as appropriate.
3	<p>The response achieves the following:</p> <ul style="list-style-type: none"> • The response demonstrates a good understanding of using ratio and rate reasoning to solve real-world and mathematical problems. • Give 3 points for Part A and Part B correct and Part C partially correct OR Part A or Part B correct and Part C correct based on an error in a previous part. <ul style="list-style-type: none"> • Response is mostly correct, but contains either a computation error or an unclear or incomplete explanation. • Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained. • Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate.
2	<p>The response achieves the following:</p> <ul style="list-style-type: none"> • The response demonstrates a partial understanding of using ratio and rate reasoning to solve real-world and mathematical problems. • Give 2 points for Part A and Part B correct OR for Part C correct based on incorrect answers given in Part A and Part B. <ul style="list-style-type: none"> • Response is only partially correct. • Response shows application of a relevant strategy, though it may be only partially applied or remain unexplained. • Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate.

Points	Description
1	<p>The response achieves the following:</p> <ul style="list-style-type: none"> The response demonstrates a limited understanding of using ratio and rate reasoning to solve real-world and mathematical problems. Give 1 point for Part A correct OR Part B correct OR Part C partially correct. <ul style="list-style-type: none"> Response is only partially correct. Response shows incomplete or inaccurate application of a relevant strategy. Mathematical ideas are expressed only partially using words, calculations, and/or symbols as appropriate.
0	<p>The response achieves the following:</p> <ul style="list-style-type: none"> The response demonstrates no understanding of using ratio and rate reasoning to solve real-world and mathematical problems. <ul style="list-style-type: none"> Response shows no application of a strategy. Mathematical ideas cannot be interpreted or lack sufficient evidence to support even a limited understanding.

Exemplar Response

Points Awarded	Sample Response
4	<p>Part A: \$0.42 Part B: \$2.70 Part C: By shopping at Gary’s Gardens, Kate will save \$0.36. AND The difference in cost per pound at the two places is \$0.03 per pound times 12 pounds, which is \$0.36. OR other valid response</p>
3	<p>Part A: \$0.42 Part B: \$2.70 Part C: \$0.36 OR other valid response</p>
2	<p>Part A: \$0.42 Part B: \$2.70</p>
1	<p>Part A: \$0.42</p>
0	<p>Response is irrelevant, inappropriate, or not provided.</p>