The content of the assessment is organized into four 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 8 Mathematics are grouped into four domains: Numbers, Expressions, and Equations; Algebra and Functions; 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 8 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 8 Mathematics EOG assessment. Educators should always use the content standards when planning instruction.

GRADE 8 MATHEMATICS: DOMAIN STRUCTURES AND CONTENT WEIGHTS

Reporting Categories and Content Standards

Reporting Category/Domain	Content Standards Assessed	Approximate # of Points	Approximate % of Test
Numbers, Expressions, and Equations	MGSE8.EE (1, 2, 3, 4) MGSE8.NS (1, 2)	12	20%
Algebra and Functions	MGSE8.EE (5, 6, 7, 7a, 7b, 8, 8a, 8b, 8c) MGSE8.F (1, 2, 3, 4, 5)	23	40%
Geometry	MGSE8.G (1, 2, 3, 4, 5, 6, 7, 8, 9)	16	28%
Statistics and Probability	MGSE8.SP (1, 2, 3, 4)	7	12%
	Total	**58**	**100%**

The Standards for Mathematical Practice (1–8) will be embedded within items aligned to the mathematical content standards.

ITEM TYPES

The Mathematics portion of the Grade 8 EOG assessment consists of selected-response and technology-enhanced items.

A selected-response item, sometimes called a multiple-choice item, is defined as a question, problem, or statement that is 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 choices provided, the best answer to the question (the stem). The Mathematics selected-response items will have four answer choices.

A technology-enhanced item is an innovative way to measure student skills and knowledge by using scaffolding within a multi-step process. Technology-enhanced items are worth one or two points. If the item is worth two points, partial credit is awarded for special combinations of responses that do not include all the correct answers. For Mathematics, there are a number of specific technology-enhanced item types being used:

- In multi-select items, the student is asked to pick two or three correct responses from five or six answer options.
- In multi-part items, the student responds to a question, statement, or prompt that has two or more parts.
- In drag-and-drop items, the student uses a mouse, touchpad, or touchscreen to move responses to designated areas on the screen.
- In drop-down menu items, the student uses a mouse, touchpad, or touchscreen to open a drop-down menu and select an option from the menu. A drop-down menu item may have multiple drop-down menus.
- In keypad-input items, the student uses the physical keyboard or the pop-up keyboard on a touchscreen to type a number, expression, or equation into an answer box.
- In coordinate-graph items, the student uses a mouse, touchpad, or touchscreen to draw lines and/or plot points on a coordinate grid on the screen.
- In line-plot items, the student uses a mouse, touchpad, or touchscreen to place Xs above a number line to create a line plot.
- In bar-graph items, the student uses a mouse, touchpad, or touchscreen to select the height of each bar to create a bar graph.
- In number-line items, the student uses a mouse, touchpad, or touchscreen to plot a point and/or represent inequalities.
- Since some technology-enhanced items in this guide were designed to be used only in an online, interactive-delivery format, some of the item-level directions will not appear to be applicable when working within the format presented in this document (for example, "Move the clocks into the graph" or "Create a scatter plot").
- This icon  identifies special directions that will help the student answer technology-enhanced items as shown in the format presented within this guide. These directions do not appear in the online version of the test but explain information about how the item works that would be easily identifiable if the student were completing the item in an online environment.

To give students practice using technology-enhanced items in an online environment very similar to how they will appear on the online test, visit "Experience Online Testing Georgia."

1. Go to the website "Welcome to Experience Online Testing Georgia" (http://gaexperienceonline.com/).
2. Select "Test Practice."
3. On the right side of the page, you will see "End-of-Grade (EOG) Spring Main." Select "Online Tools Training" which appears underneath it.
4. Select "EOG Test Practice."
5. Select "Technology Enhanced Items."
6. Select "All Grades."
7. You will be taken to a login screen. Use the username and password provided on the screen to log in and practice navigating technology-enhanced items online.

Please note that Google Chrome is the only supported browser for this public version of the online testing environment.

MATHEMATICS DEPTH OF KNOWLEDGE EXAMPLE ITEMS

Example items that represent the applicable DOK levels across various Grade 8 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

Selected-Response: 1 point

DOK Level: 1

Mathematics Grade 8 Content Domain: Numbers, Expressions, and Equations

Standard: MGSE8.NS.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

Which of these is an irrational number?

A. 4.25×10^{-2}

B. $0.\overline{73}$

C. $\sqrt{5}$

D. $\frac{456}{5}$

Correct Answer: C

Explanation of Correct Answer: The correct answer is choice (C) $\sqrt{5}$. The square root of a number that is not a perfect square is irrational. Choice (A) is incorrect because it is a terminating decimal in scientific notation, which is rational. Choice (B) is incorrect because it is a repeating decimal, which is rational. Choice (D) is incorrect because it is a fraction whose decimal expansion terminates, which is rational.

Example Item 2

Selected-Response: 1 point

DOK Level: 2

Mathematics Grade 8 Content Domain: Algebra and Functions

Standard: MGSE8.EE.7. Solve linear equations in one variable.
b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Solve.

$7x - 3(4 + x) = 28$

A. $x = 4$
B. $x = 5$
C. $x = 7$
D. $x = 10$

Correct Answer: D

Explanation of Correct Answer: The correct answer is choice (D) $x = 10$. Applying the distributive property gives the equation $7x - 12 - 3x = 28$. Grouping like terms gives the equation $4x = 40$. Dividing both sides of the equation by 4 gives the solution $x = 10$. Choice (A) is incorrect because it is the result of subtracting 12 from the right side instead of adding. Choice (B) is incorrect because it is the result of failing to distribute the –3 to the x term in the parentheses. Choice (C) is incorrect because it is the result of ignoring the term –12 when grouping like terms, so the variable terms are set equal to 28 instead of 40.

Example Item 3

Selected-Response: 1 point

DOK Level: 3

Mathematics Grade 8 Content Domain: Algebra and Functions

Standard: MGSE8.EE.8. Analyze and solve pairs of simultaneous linear equations (systems of linear equations).

b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.

Look at the system of equations.

$$y = x + 4$$
$$2y = 2x + 8$$

Which statement about this system of equations is true and why?

A. It has no solution because the lines are parallel when graphed.
B. It has no solution because the equations are the same line when graphed.
C. It has infinitely many solutions because the lines are parallel when graphed.
D. It has infinitely many solutions because the equations are the same line when graphed.

Correct Answer: D

Explanation of Correct Answer: The correct answer is choice (D) It has infinitely many solutions because the equations are the same line when graphed. The second equation is written as $y = x + 4$ in slope-intercept form, so it has the same slope, 1, and intercept, 4, as the first equation. Therefore, the equations are the same line and there are infinitely many solutions, represented by the points on the line. Choice (A) is incorrect because it assumes the lines are parallel rather than the same line. Choice (B) is incorrect because it misinterpreted coincident lines as having no common solutions. Choice (C) is incorrect because it assumes the lines are parallel and that parallel lines have infinitely many solutions.

MATHEMATICS ADDITIONAL SAMPLE ITEMS

This section has two parts. The first part is a set of 21 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.

Georgia Milestones Assessment System

Grade 8 Mathematics Formula Sheet

Below are the formulas you may find useful as you take the test. However, you may find that you do not need to use all of the formulas. You may refer to this formula sheet as often as needed.

Slope Formula

$m = \frac{y_2 - y_1}{x_2 - x_1}$

Linear Equation

$y = mx + b$

Pythagorean Theorem

$a^2 + b^2 = c^2$

Perimeter

The perimeter of a polygon is equal to the sum of the lengths of its sides.

Volume

Cylinder	$V = \pi r^2 h$
Cone	$V = \frac{1}{3}\pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$

$\pi \approx 3.14$

You can find this mathematics formula sheet on the Georgia Milestones webpage at http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Assessment/Pages/Georgia-Milestones-EOG-Resources.aspx.

Item 1

Selected-Response: 1 point

Sofia read that there are approximately 2×10^{11} stars in the Milky Way Galaxy. She also read that there are approximately 3×10^{22} stars in the entire universe.

How many times the number of stars in the Milky Way Galaxy is the number of stars in the universe?

A. 1.5×10^{2}
B. 1.5×10^{11}
C. 6×10^{11}
D. 6×10^{33}

Item 2

Selected-Response: 1 point

Solve for *x*.

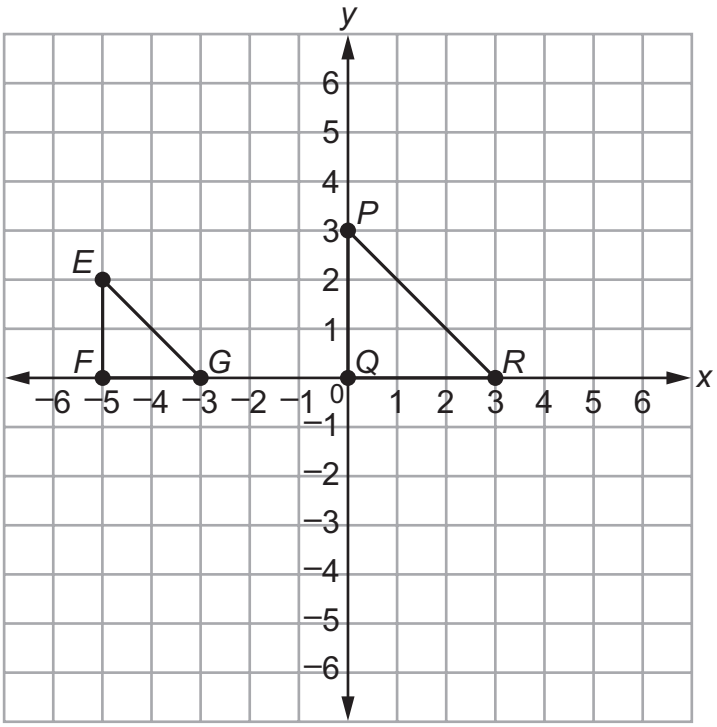
$$x^2 = 81$$

A. $x = 162$
B. $x = 40.5$
C. $x = -9$ and $x = 9$
D. $x = -9$ and $x = -81$

Item 3

Selected-Response: 1 point

Look at triangles *PQR* and *EFG*.



Which of these explains why triangles *PQR* and *EFG* are similar?

A. Triangle *EFG* is a result of dilating triangle PQR using a scale factor of $\frac{3}{2}$, with the origin as the center, and reflecting it across the y-axis.

B. Triangle *EFG* is a result of dilating triangle *PQR* using a scale factor of $\frac{2}{3}$, with the origin as the center, and reflecting it across the *y*-axis.

C. Triangle *EFG* is a result of dilating triangle *PQR* using a scale factor of $\frac{2}{3}$, with the origin as the center, and translating it 5 units to the left.

D. Triangle *EFG* is a result of dilating triangle *PQR* using a scale factor of $\frac{3}{2}$, with the origin as the center, and translating it 5 units to the left.

Item 4

Selected-Response: 1 point

An expression is shown.

$$3^3 \times 3^{-2}$$

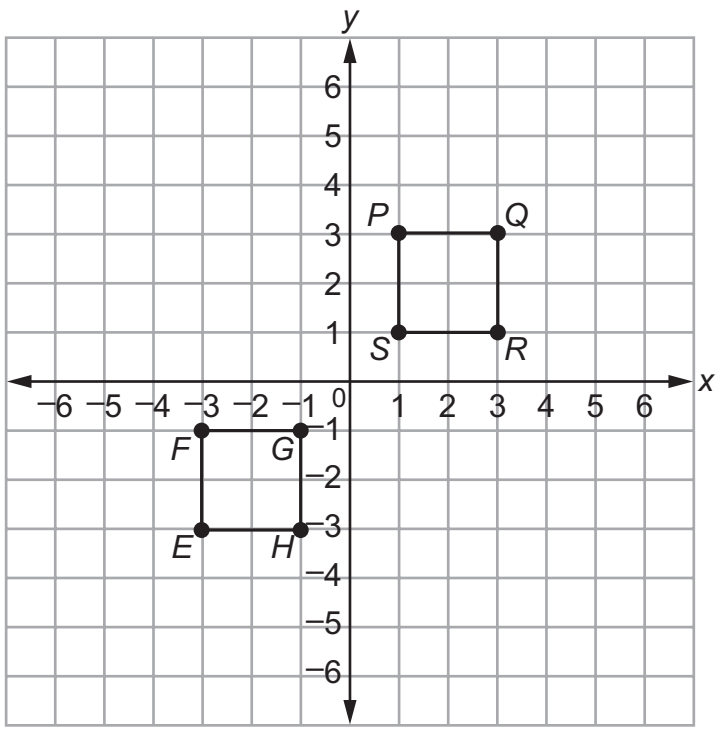
What is the value of the expression?

A. –54
B. –243
C. 243
D. 3

Item 5

Selected-Response: 1 point

Square *PQRS* is congruent to square *EFGH*.



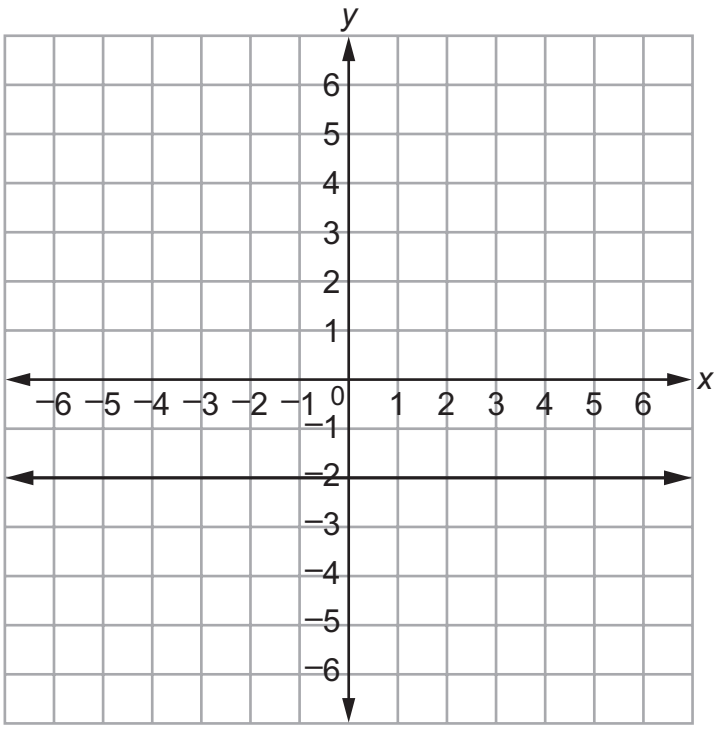
Which series of transformations to square *PQRS* will result in square *EFGH*?

A. translation down by 3 units followed by reflection across the *y*-axis
B. reflection across the *y*-axis followed by translation down by 5 units
C. reflection across the *x*-axis followed by 45° clockwise rotation about the origin
D. translation to the left by 4 units followed by 90° counterclockwise rotation about the origin

Item 6

Selected-Response: 1 point

Greg wants to compare two different relations. He drew a graph for one relation and created a table of values for the other relation.



x	*y*
2	2
2	0
2	−2
2	−4

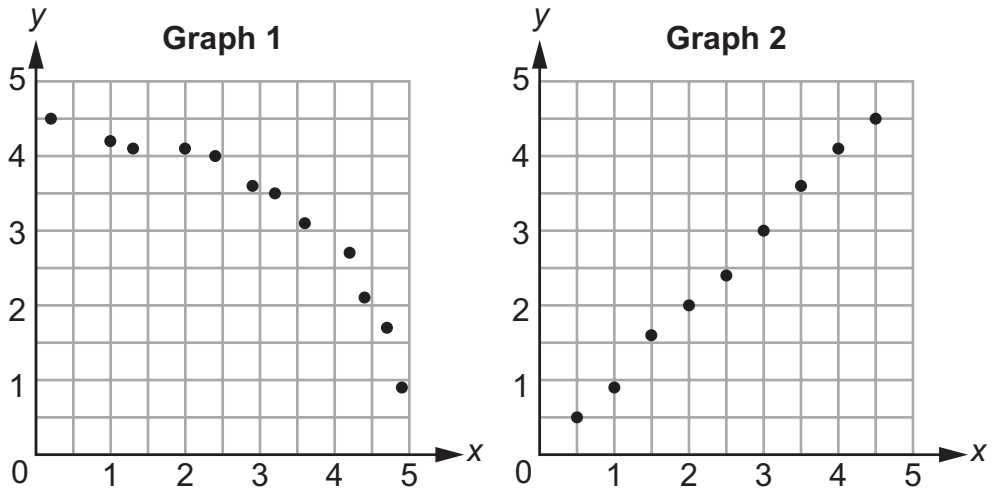
Which statement about this graph and the values in this table is true?

A. Neither relation represents a function.
B. Both relations represent functions.
C. The graph represents a function, but the values in the table do not represent a function.
D. The graph does not represent a function, but the values in the table represent a function.

Item 7

Selected-Response: 1 point

Harry constructed two scatter plots to represent the relationship between *x* and *y* in two experiments.



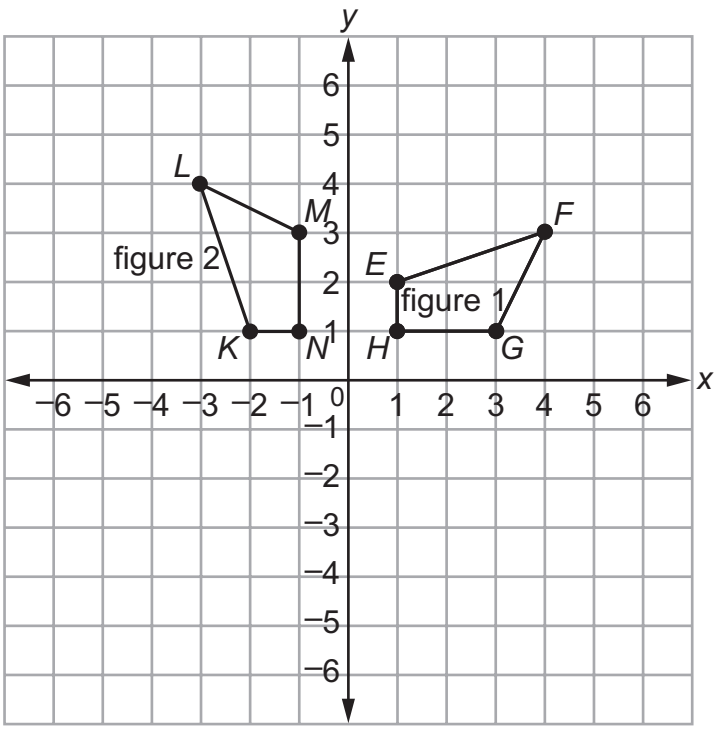
Which statement BEST compares the two graphs?

A. Graph 1 shows a linear positive association, and Graph 2 shows a nonlinear negative association.
B. Graph 1 shows a linear negative association, and Graph 2 shows a nonlinear positive association.
C. Graph 1 shows a nonlinear positive association, and Graph 2 shows a linear negative association.
D. Graph 1 shows a nonlinear negative association, and Graph 2 shows a linear positive association.

Item 8

Selected-Response: 1 point

Figure 1 is rotated counterclockwise by 90° about the origin to obtain figure 2.



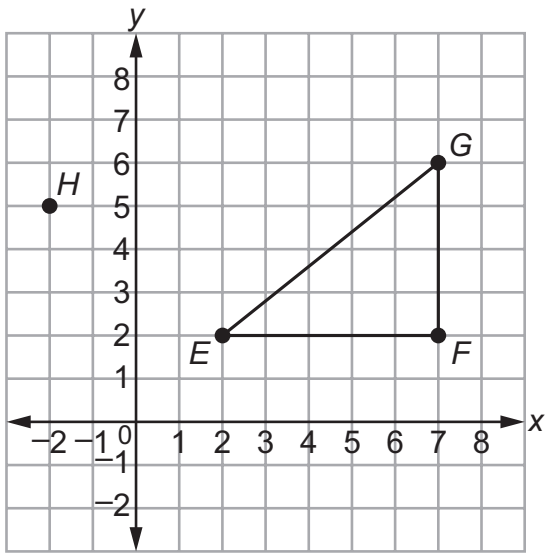
Which statement about the angles in figure 1 and figure 2 is true?

A. $m\angle G = m\angle K$
B. $m\angle H = m\angle L$
C. $m\angle G = m\angle M$
D. $m\angle H = m\angle K$

Item 9

Multi-Part Technology-Enhanced: 2 points

The coordinate grid shows right triangle *EFG* and point *H*.



Part A

What is the distance, in units, from point *E* to point *G*?

A. 3
B. $\sqrt{18}$
C. $\sqrt{41}$
D. 9

Part B

What is the distance, in units, from point *E* to point *H*?

A. $\sqrt{7}$
B. $\sqrt{14}$
C. 5
D. 75

Item 10

Multi-Select Technology-Enhanced: 2 points

Select THREE equations whose graphs are straight lines.

A. $y = 7$

B. $y = 2x^2$

C. $y = \frac{1}{2}x$

D. $3x + y = 10$

E. $y = x^2 - 2$

F. $x^2 + y^2 = 1$

Item 11

Multi-Part Multi-Select Technology-Enhanced: 2 points

The two-way table shows some survey results from when 100 Georgia residents were asked whether they were born in Georgia.

Georgia Residents

	Born in Georgia	Not Born in Georgia	Total
Female			66
Male	16		
Total		47	

The are values missing from the two-way table. You will need to determine the missing values from the two-way table.

Part A

How many of the males surveyed were not born in Georgia?

A. 16
B. 18
C. 29
D. 34

Part B

Select TWO statements that are true about the data.

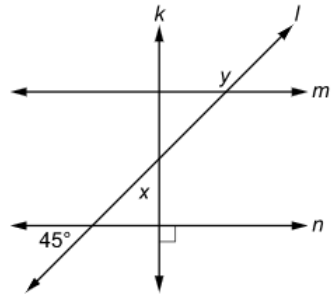
A. There were more males born in Georgia than there were females born in Georgia.
B. More than half of all residents surveyed were born in Georgia.
C. More males were born in Georgia than were not born in Georgia.
D. More females were not born in Georgia than were born in Georgia.
E. There were more females not born in Georgia than there were males not born in Georgia.

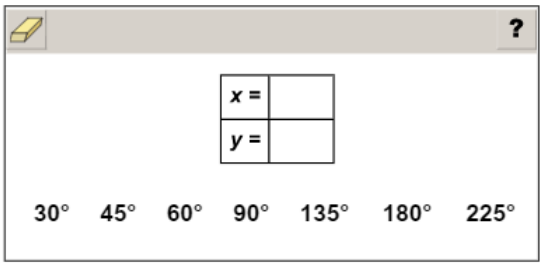
Item 12

Drag-and-Drop Technology-Enhanced: 2 points

In the figure shown, line *m* is parallel to line *n*.

Move an angle measure into each box to show the values of *x* and *y*.



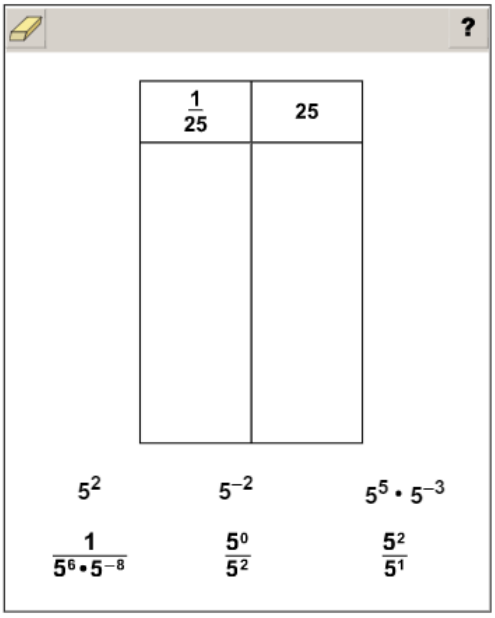


Use a mouse, touchpad, or touchscreen to move an angle measure into each box. Each angle measure may be used twice.

Item 13

Drag-and-Drop Technology-Enhanced: 2 points

Move expressions into the columns that are equivalent to the value given at the top of each column. Not all expressions will be used.



Use a mouse, touchpad, or touchscreen to move expressions into the columns. Each expression may be used once.

Item 14

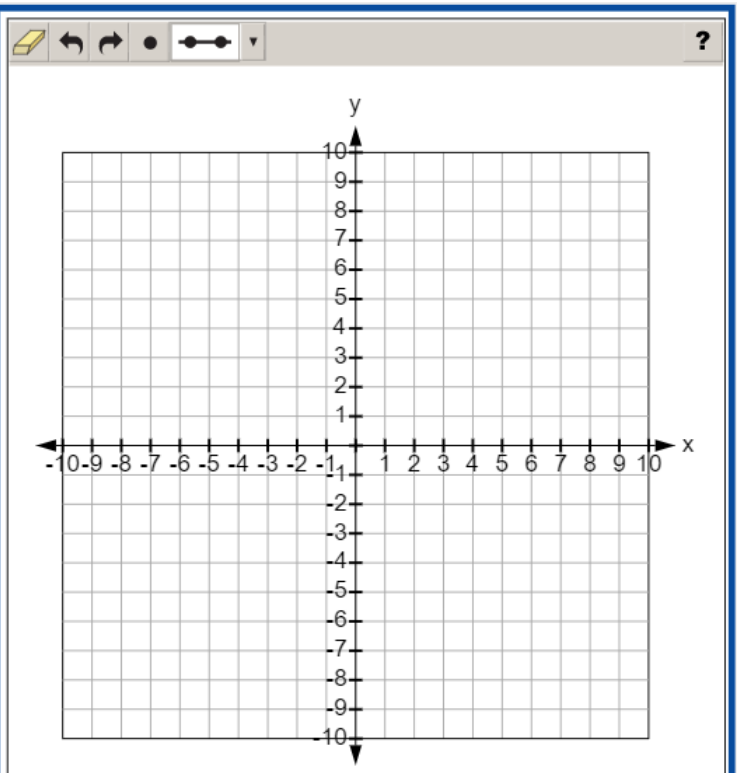
Coordinate-Graph Technology-Enhanced: 2 points

The equation and table shown represent different linear functions.

$y = 3.5x + 5$

x	y
0	4
2	10
4	16

Graph the line that represents the function with the greater rate of change.



Use a mouse, touchpad, or touchscreen to graph a line on the coordinate grid. At most 1 line and 3 points can be graphed.

Item 15

Coordinate-Graph Multi-Part Technology-Enhanced: 2 points

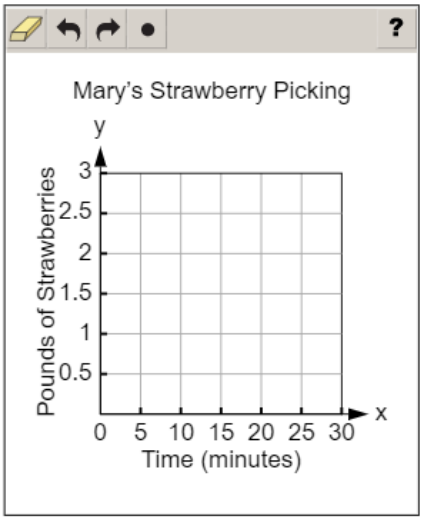
Part A

Mary picked strawberries each day for five days. The time, in minutes, she spent picking strawberries each day and the number of pounds of strawberries she picked each day are shown in the table.

Mary's Strawberry Picking

Time (minutes)	Pounds of Strawberries
10	0.5
20	1.0
15	0.9
30	1.5
20	1.2

Part A Create a scatter plot of Mary's strawberry picking based on the data.



Use a mouse, touchpad, or touchscreen to plot points on the coordinate grid. At most 5 points can be plotted.

Go on to the next page to finish item 15.

Item 15. *Continued*.

Part B

Mary picked strawberries each day for five days. The time, in minutes, she spent picking strawberries each day and the number of pounds of strawberries she picked each day are shown in the table.

Mary's Strawberry Picking

Time (minutes)	Pounds of Strawberries
10	0.5
20	1.0
15	0.9
30	1.5
20	1.2

Part B Mary went strawberry picking a sixth day and spent 45 minutes picking strawberries.

Which type of association between the time spent picking strawberries and the number of pounds of strawberries picked BEST explains why it is likely that Mary picked more than 1.5 pounds of strawberries on the sixth day?

(a) no association

(b) nonlinear association

(c) negative association

(d) positive association

Use a mouse, touchpad, or touchscreen to select a response.

Item 16

Drag-and-Drop Technology-Enhanced: 2 points

A town is offering rentals of bicycles and electric scooters at the park. The rental cost in dollars, y, and the amount of time in minutes, x, are represented by the equations shown.

- **Bicycle Rental: $y = 0.08x + 2$**
- **Electric Scooter Rental: $y = 0.16x + 1$**

Move a number into each blank to complete each sentence.

The total cost to rent a bicycle for one hour is $_____.

The total cost to rent an electric scooter for one hour is $_____.

The cost of renting a bicycle and the cost of renting an electric scooter are the same when rented for _____ minutes.

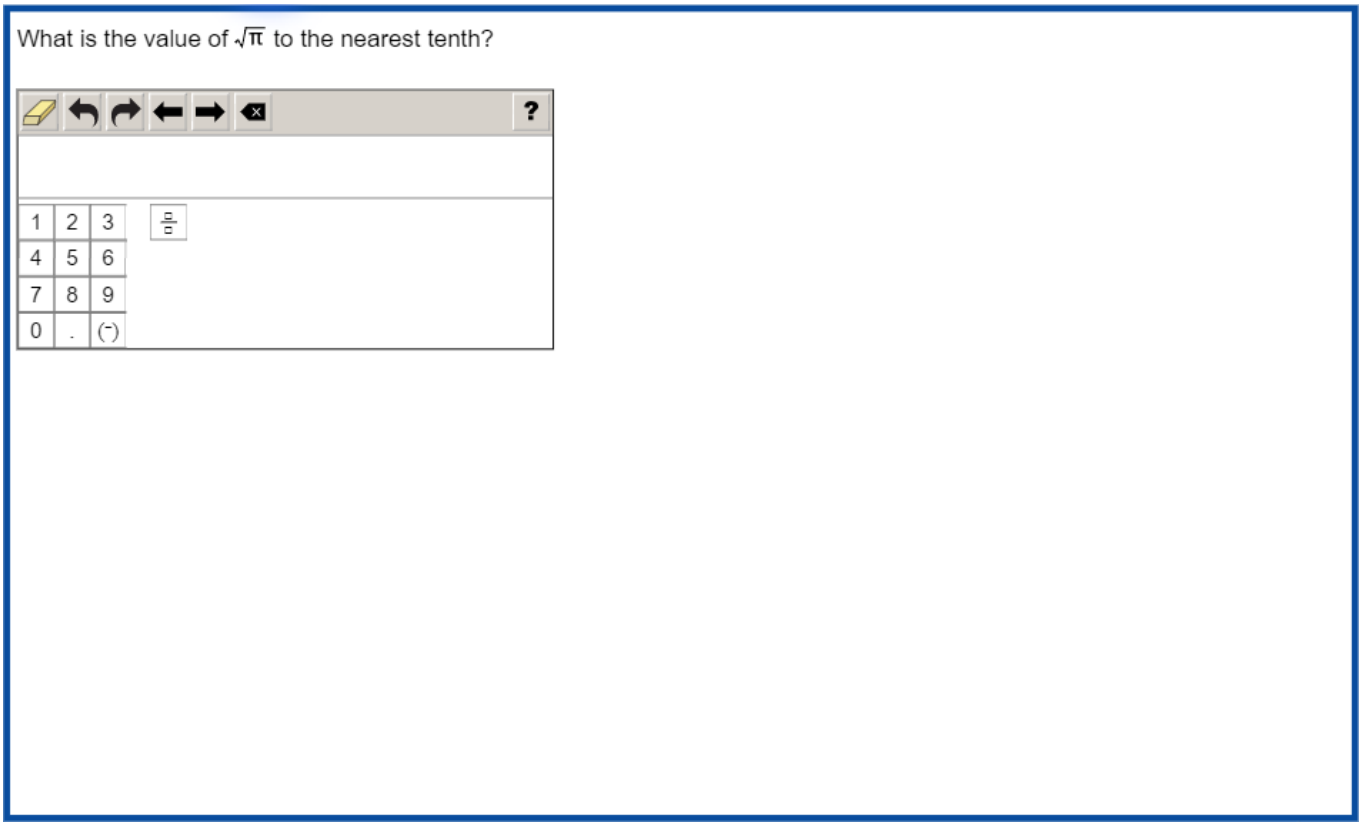
0.08 0.16 1.00 2.00 6.80

8.80 9.60 10.60 12.50

Use a mouse, touchpad, or touchscreen to move a number into each blank. Each number may be used 3 times.

Item 17

Keypad-Input Technology-Enhanced: 1 point

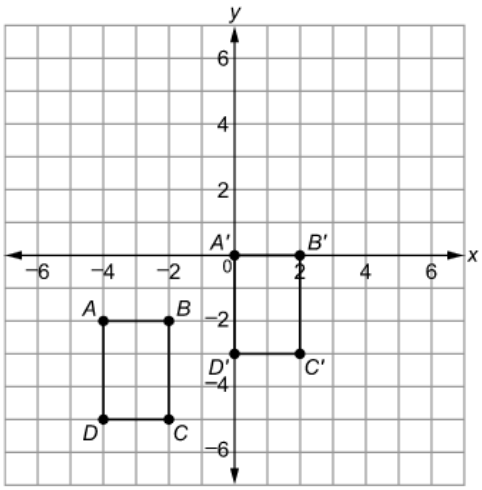


Use a mouse, touchpad, or touchscreen to enter a response.

Item 18

Drop-Down Technology-Enhanced: 1 point

Quadrilateral *ABCD* is congruent to quadrilateral *A'B'C'D'*, as shown on the coordinate plane.



Use the drop-down menus to describe the sequence of transformations that can be used to map quadrilateral *ABCD* to quadrilateral *A'B'C'D'*.

Quadrilateral *ABCD* is translated [ ] and [ ]

Use a mouse, touchpad, or touchscreen to click the arrow beside each of the two blank boxes. When you click the arrow, a drop-down menu will appear, showing you all the possible options for that blank. Each drop-down menu with its options is shown below.

Quadrilateral *ABCD* is translated [ ] and [ ]

2 units to the left.
4 units to the left.
2 units to the right.
4 units to the right.

2 units up
4 units up
2 units down
4 units down

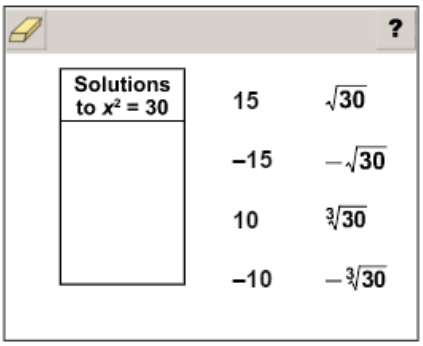
Item 19

Drag-and-Drop Technology-Enhanced: 1 point

An equation is shown.

$$x^2 = 30$$

Move values into the box to show ALL the solutions to the equation. Not all values will be used.

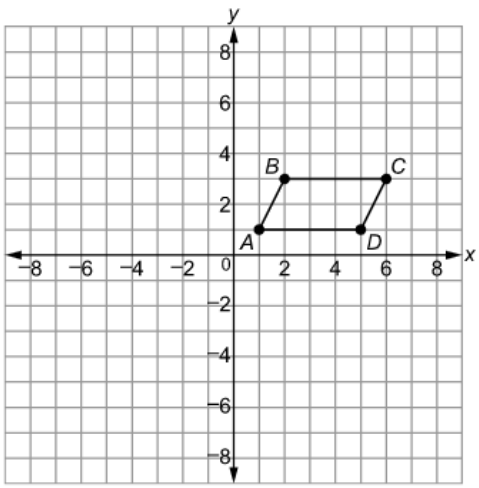


Use a mouse, touchpad, or touchscreen to move the numbers into the box. Each number may be used 1 time.

Item 20

Drop-Down Multi-Part Technology-Enhanced: 2 points

Parallelogram *ABCD* is shown on the coordinate plane.



Part A Parallelogram *ABCD* will be reflected over the *x*-axis to create parallelogram *A'B'C'D'*.

Use the drop-down menus to show the coordinates of point *C'* after the reflection of parallelogram *ABCD*.

C' (▾ , ▾)

Part B Parallelogram *ABCD* will be reflected over the *x*-axis. Then, it will be rotated 90° counterclockwise about the origin to create parallelogram *A"B"C"D"*.

Use the drop-down menus to show the coordinates of point *B"* after the series of transformations.

B" (▾ , ▾)

Use a mouse, touchpad, or touchscreen to click the arrow beside each of the four blank boxes. When you click the arrow, a drop-down menu will appear, showing you all the possible options for that blank. Each drop-down menu with its options is shown below.

C' (▾ , ▾)

–6	–6
–3	–3
3	3
6	6

Part ...*ABCD* will be reflected over the *x*-axis. Then, it will be r... ...ockwise about the origin to create para... .

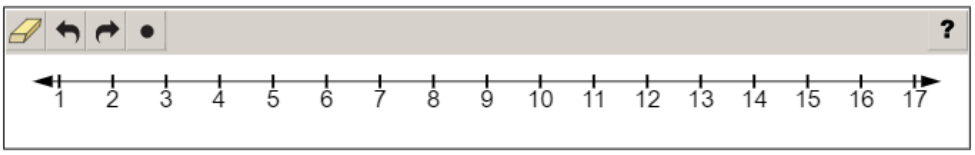
B" (▾ , ▾)

–3	–3
–2	–2
2	2
3	3

Item 21

Number-Line Technology-Enhanced: 1 point

Plot two points that represent the two consecutive integers that the value of $\sqrt{29}$ lies between.



Use a mouse, touchpad, or touchscreen to plot points on the number line. At most 2 points can be plotted.

MATHEMATICS ADDITIONAL SAMPLE ITEM KEYS

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
1	MGSE8.EE.3	2	B	The correct answer is choice (B) 1.5×10^{11}. To divide numbers in scientific notation, divide the coefficients and subtract the exponents of the common base. Since $\frac{3}{2} = 1.5$ and $22 - 11 = 11$, the quotient is 1.5×10^{11}. Choice (A) is incorrect because it is the result of dividing the exponents instead of subtracting. Choice (C) is incorrect because it is the result of multiplying 3×2 instead of dividing. Choice (D) is incorrect because it is the product of the two quantities.
2	MGSE8.EE.2	1	C	The correct answer is choice (C) $x = -9$ and $x = 9$. Choice (A) is incorrect because it multiplies 81 by 2 instead of finding the square root. Choice (B) is incorrect because it divided 81 by 2. Choice (D) is incorrect because -81 is not a root of 81.
3	MGSE8.G.4	2	C	The correct answer is choice (C) Triangle *EFG* is a result of dilating triangle *PQR* using a scale factor of $\frac{2}{3}$, with the origin as the center, and translating it 5 units to the left. $\frac{EF}{PQ} = \frac{FG}{QR} = \frac{EG}{PR} = \frac{2}{3}$, so *EFG* is the result of dilating *PQR* using a scale factor of $\frac{2}{3}$. The vertices of *EFG* are 5 units to the left of the corresponding vertices in the dilated triangle, so *EFG* is the result of translating the dilated triangle 5 units to the left. Choice (A) is incorrect because it confuses translation and reflection and uses the reciprocal of the scale factor. Choice (B) is incorrect because it confuses translation and reflection. Choice (D) is incorrect because it uses the reciprocal of the scale factor.

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
4	MGSE8.EE.1	1	D	The correct answer is choice (D) 3. The value of 3^3 is 27 and the value of 3^{-2} is $\frac{1}{9}$, and 27 times $\frac{1}{9}$ is 3. Choice (A) is incorrect because it multiplies the numbers instead of using the powers. Choices (B) and (C) are incorrect because they do not use the negative exponent correctly.
5	MGSE8.G.2	2	D	The correct answer is choice (D) translation to the left by 4 units followed by 90° counterclockwise rotation about the origin. Vertex *P* corresponds to vertex *E*, so *PQRS* must be translated 4 units to the left and then rotated 90° counterclockwise about the origin. Choices (A), (B), and (C) are incorrect because the images of *PQRS* will be oriented incorrectly and will not lie on *EFGH*.
6	MGSE8.F.4	2	C	The correct answer is choice (C) The graph represents a function, but the values in the table do not represent a function. The graph represents a function because it is a horizontal line, but the values in the table do not represent a function because there are multiple values for *y* for a single value of *x*. A function has exactly one output for each input. The table does not represent a function because the input $x = 2$ has more than one value for *y*. Choice (A) is incorrect because it assumes that a horizontal line is not a function. Choice (B) is incorrect because it assumes that all straight-line graphs represent functions. Choice (D) is incorrect because it confuses the definitions of functions and non-functions.
7	MGSE8.SP.1	2	D	The correct answer is choice (D) Graph 1 shows a nonlinear negative association, and Graph 2 shows a linear positive association. The points on Graph 1 can be best approximated with a curve, and *y*-values decrease as *x*-values increase. The points on Graph 2 can be best approximated with a line, and *y*-values increase as *x*-values increase. Choice (A) is incorrect because it confuses the descriptions of Graph 1 and Graph 2. Choice (B) is incorrect because it misidentifies the patterns in the graph. Choice (C) is incorrect because it confuses positive and negative association.

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
8	MGSE8.G.1	2	C	The correct answer is choice (C) $m\angle G = m\angle M$. A rotation is a rigid motion, so figure 1 is congruent to figure 2 and corresponding angles are congruent. Since angle *G* corresponds to angle *M*, the measures of the angles are equal. Choices (A), (B), and (D) are incorrect because they equate the measures of angles that are not congruent.
9	MGSE8.G.8	2	Part A: C Part B: C	Part A: The correct answer is choice (C) $\sqrt{41}$. Using the Pythagorean Theorem results in the square root of 41 for the distance from point *E* to point *G*. Choices (A), (B), and (D) are incorrect because they all give the incorrect distance from point *E* to point *G*. Part B: The correct answer is choice (C) 5. Using the Pythagorean Theorem results in a distance of 5 from point *E* to point *H*. Choices (A), (B), and (D) are incorrect because they all give the incorrect distance from point *E* to point *H*.
10	MGSE8.F.3	2	A/C/D	The correct answer is choices (A), (C), and (D). They all make straight lines when graphed. Choices (B), (E), and (F) are all incorrect because the graphs are not straight lines.
11	MGSE8.SP.4	3	Part A: B Part B: B/E	Part A: The correct answer is choice (B) 18. After finding the missing values in the table, the number of males not born in Georgia is 18. Choices (A), (C), and (D) are incorrect because they have the incorrect number of males not born in Georgia. Part B: The correct answer is choices (B) and (E). They are true statements about the data. Choices (A), (C), and (D) are incorrect statements.
12	MGSE8.G.5	2	N/A	See scoring rubric and exemplar response on page 105.
13	MGSE8.EE.1	2	N/A	See scoring rubric and exemplar response on page 106.
14	MGSE8.F.2	2	N/A	See scoring rubric and exemplar response on page 107.
15	MGSE8.SP.1	2	N/A	See scoring rubric and exemplar response on page 108.
16	MGSE8.EE.8c	2	N/A	See scoring rubric and exemplar response on page 109.
17	MGSE8.NS.2	1	N/A	See scoring rubric and exemplar response on page 110.

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
18	MGSE8.G.2	2	N/A	See scoring rubric and exemplar response on page 111.
19	MGSE8.EE.2	2	N/A	See scoring rubric and exemplar response on page 112.
20	MGSE8.G.3	2	N/A	See scoring rubric and exemplar response on page 113.
21	MGSE8.NS.2	2	N/A	See scoring rubric and exemplar response on page 114.

MATHEMATICS EXAMPLE SCORING RUBRICS AND EXEMPLAR RESPONSES

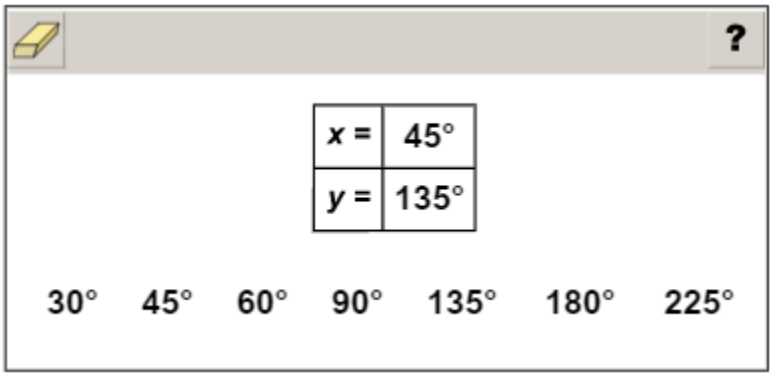
Item 12

Scoring Rubric

Points	Description
2	The student correctly answers both the *x*-value and the *y*-value.
1	The student correctly answers either the *x*-value or the *y*-value.
0	The student does not correctly answer either the *x*-value or the *y*-value.

Exemplar Response

The correct response is shown below.



Lines *k*, *l*, and *n* form a triangle. Angle *x* is one of the interior angles of the triangle, and the other two angles in the triangle are vertical angles with the 45° and 90° angles given. The sum of the interior angles of a triangle is 180°, so $x + 45° + 90° = 180°$; therefore, $x = 45°$. Line *l* is a transversal of parallel lines *m* and *n*. Angle *y* and the 45° angle given are same-side exterior angles of the parallel lines. Same-side exterior angles are supplementary, so $y + 45° = 180°$; therefore, $y = 135°$.

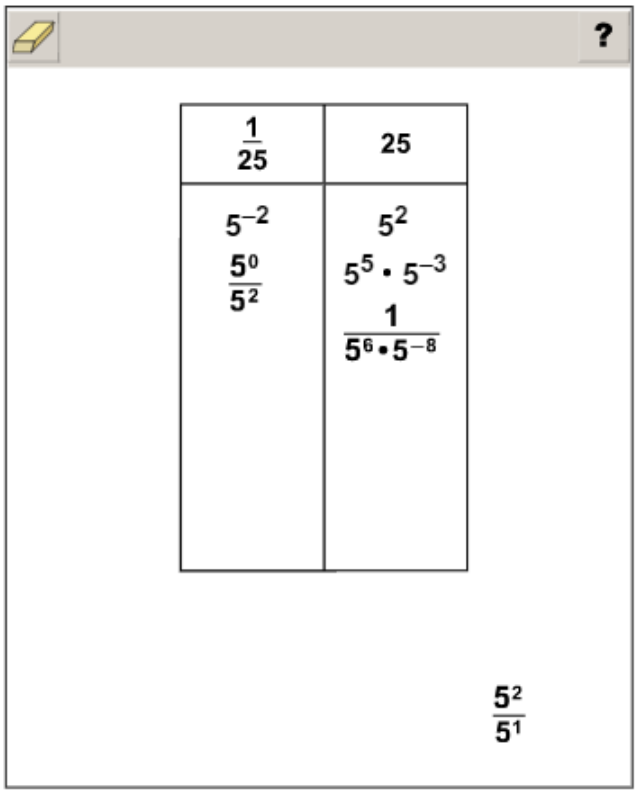
Item 13

Scoring Rubric

Points	Description
2	The student correctly answers both columns.
1	The student correctly answers only one column.
0	The student does not correctly answer either column.

Exemplar Response

The correct response is shown below.



When multiplying exponential expressions with the same base, the exponents can be added to make an equivalent expression, and a negative exponent is equivalent to the reciprocal of the expression with positive exponents. In the first column, both "5^{-2}" and "$\frac{5^0}{5^2}$" are equivalent to $\frac{1}{5^2}$, which has the same value as $\frac{1}{25}$. In the second column, "5^2" is equal to 5 × 5, which equals 25. The exponents in "$5^5 \bullet 5^{-3}$" can be added to get 5^2, so it is equal to 5^2 or 25. And "$\frac{1}{(5^6 \bullet 5^{-8})}$" has the exponents that can also be added to get the expression $\frac{1}{5^{-2}}$, which is also equal to 25. The remaining expression, "$\frac{5^2}{5^1}$" is not equivalent to either $\frac{1}{25}$ or 25, so it is left out of the table.

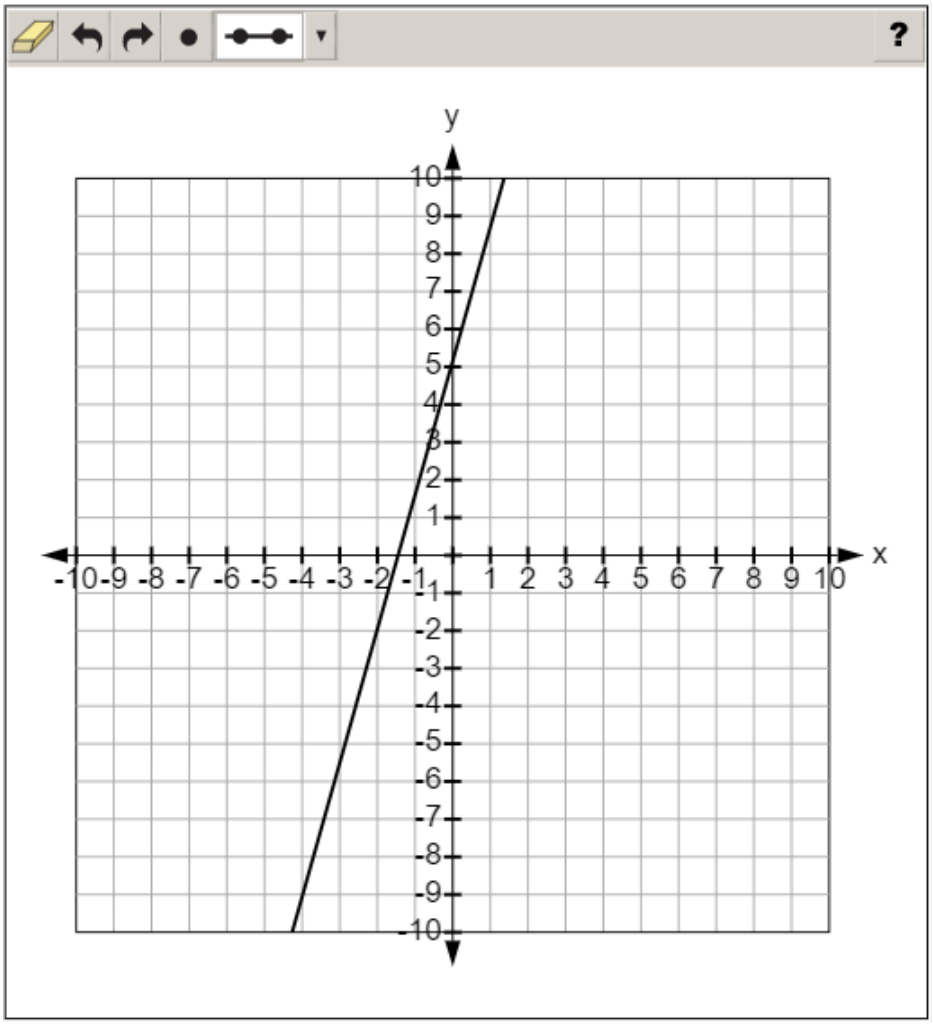
Item 14

Scoring Rubric

Points	Description
2	The student chooses to graph the function shown by the equation and correctly graphs the function.
1	The student correctly graphs the function shown by the table.
0	The student does not correctly graph either of the given functions.

Exemplar Response

The correct response is shown below.



The rate of change in the equation is 3.5, and the rate of change in the table is 3, so the equation has the greater rate of change and is graphed on the coordinate grid. To graph the equation, the line passes through the *y*-intercept, which is at (0, 5), and one other point that can be found using the slope, such as (–2, –2) or (1, 8.5).

Item 15

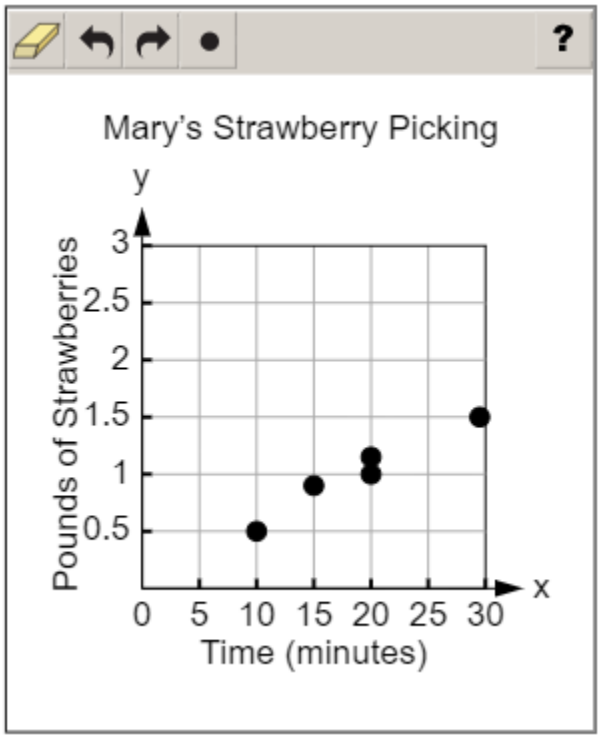
Scoring Rubric

Points	Description
2	The student correctly answers both Part A and Part B.
1	The student correctly answers either Part A OR Part B.
0	The student does not correctly answer either part.

Exemplar Response

Part A

The correct response is shown below.



The table of values can be represented as a set of coordinate pairs: (10, 0.5), (20, 1.0), (15, 0.9), (30, 1.5), and (20, 1.2). These points are then plotted on the coordinate grid with the first number representing the time (*x*-axis) and the second number representing pounds of strawberries (*y*-axis).

Part B

The correct answer is choice (D) positive association. As the time increases, the pounds of strawberries should increase as well. Choice (A) is incorrect because no association means that no conclusions can be drawn from the data. Choice (B) is incorrect because the data appear to form a straight line. Choice (C) is incorrect because negative association would mean the pounds of strawberries decreases as the time increases.

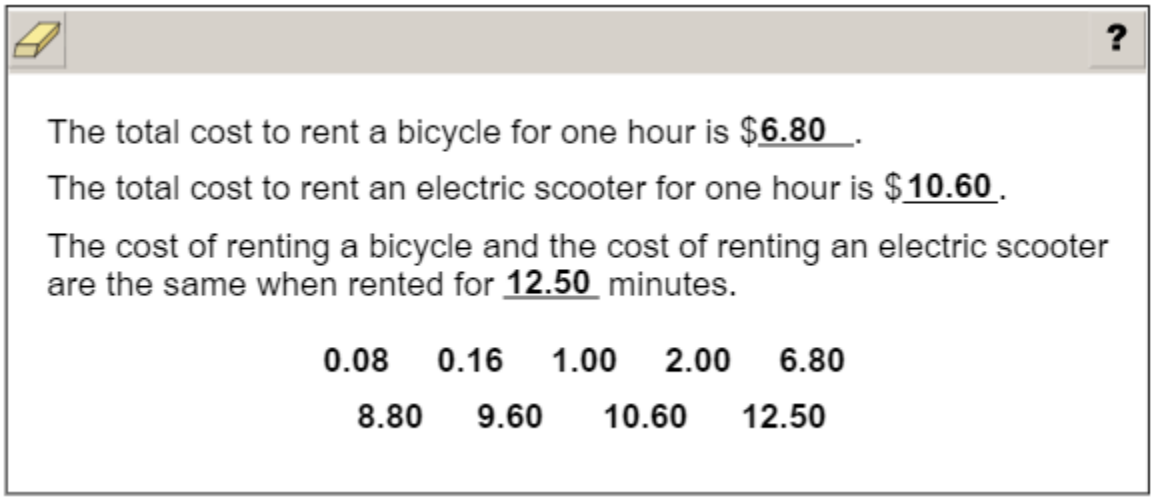
Item 16

Scoring Rubric

Points	Description
2	The student correctly completes all three statements.
1	The student correctly completes any two of the three statements.
0	The student correctly completes one or none of the statements.

Exemplar Response

The correct response is shown below.



The first statement is complete with the number “6.80” because the cost to rent a bicycle for 1 hour (60 minutes) can be calculated by using the number 60 for x in the equation for the bicycle rental; $0.08 \times 60 + 2 = 4.8 + 2 = 6.8$, which means the cost of renting the bicycle for one hour is $6.80. The second statement is complete with the number “10.60” because the cost to rent an electric scooter for one hour (60 minutes) can be calculated by using 60 for x in the equation for the electric scooter rental; $0.16 \times 60 + 1 = 9.6 + 1 = 10.6$, which means the cost of renting the electric scooter for one hour is $10.60. The third statement is complete with the number “12.50” because in order to determine when the cost would be the same, the equations must be equal to each other; $0.08x + 2 = 0.16x + 1$, which simplifies to $1 = 0.08x$ and then $x = 12.5$.

Item 17

Scoring Rubric

Points	Description
1	The student correctly answers the question.
0	The student does not correctly answer the question.

Exemplar Response

The correct response is shown below.

This is the correct response because the square root is between 1.7 and 1.8; 1.7^2 is 2.89, and 1.8^2 is 3.24. The value of pi is closer to 3.24, so its square root is nearer to 1.8.

Item 18

Scoring Rubric

Points	Description
1	The student correctly selects both of the drop-down menu options.
0	The student does not correctly select both of the drop-down menu options.

Exemplar Response

The correct response is shown below.

Quadrilateral *ABCD* is translated [2 units up ▾] and
[4 units to the right. ▾]

Quadrilateral *A'B'C'D'* is 2 units higher than and 4 units to the right of quadrilateral *ABCD*. Therefore, to map quadrilateral *ABCD* to quadrilateral *A'B'C'D'*, the translation of each point of quadrilateral *ABCD* is 2 units up and 4 units to the right.

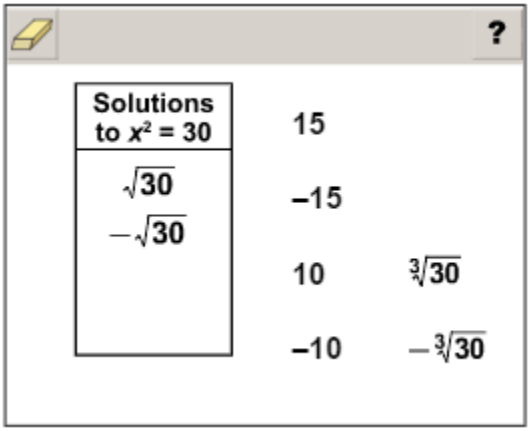
Item 19

Scoring Rubric

Points	Description
1	The student selects the two correct solutions to the equation.
0	The student does not correctly select both solutions to the equation.

Exemplar Response

The correct response is shown below.



This is the correct response because solving for *x* results in the positive or negative square root of 30.

Item 20

Scoring Rubric

Points	Description
2	The student correctly answers both Part A and Part B.
1	The student correctly answers either Part A OR Part B.
0	The student does not correctly answer either part.

Exemplar Response

Part A

The correct response is shown below.

C' (6 , –3)

This is the correct response because a reflection over the *x*-axis keeps the *x*-coordinate the same and reverses the sign of the *y*-coordinate, bringing C' to (6, –3).

Part B

The correct response is shown below.

B'' (3 , 2)

This is the correct response because a reflection over the *x*-axis keeps the *x*-coordinate the same and reverses the sign of the *y*-coordinate, bringing B' to (2, –3). Then the rotation of 90 degrees counterclockwise switches the *x*- and *y*-coordinates and reverses the sign of the original *y*-coordinate, bringing B'' to (3, 2).

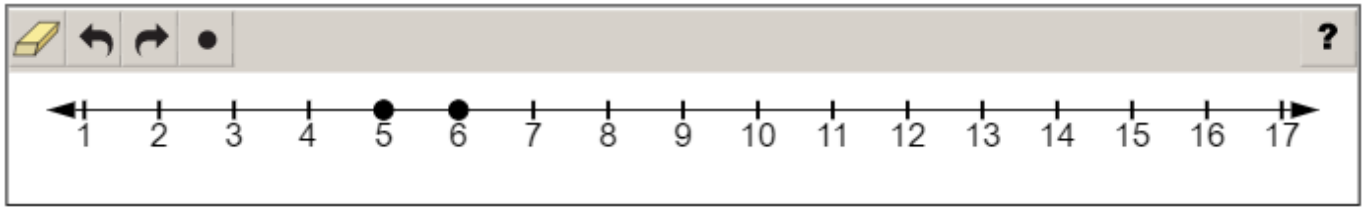
Item 21

Scoring Rubric

Points	Description
1	The student correctly plots the two points.
0	The student does not correctly plot the two points.

Exemplar Response

The correct response is shown below.



This is the correct response because the value of $\sqrt{29}$ lies between 5 and 6.