Ohio | Department of Education

Ohio's State Tests

ITEM RELEASE

SPRING 2018

GRADE 5 MATHEMATICS

Table of Contents

Grade 5 Math
Spring 2018 Item Release
Content Summary and Answer Key

Question No.*	Item Type	Content Cluster	Content Standard	Answer Key	Points
4	Equation Item	Understand the place value system.	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. *(5.NBT.1)*	---	1 point
5	Multiple Choice	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. *(5.MD.4)*	C	1 point
8	Multi-Select	Understand the place value system.	Read, write, and compare decimals to thousandths. *(5.NBT.3)* b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	B, C	1 point
17	Equation Item	Use equivalent fractions as a strategy to add and subtract fractions.	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/(bd).) (5.NF.1)*	---	1 point

* The question number matches the item number in the Item Level Report in the Online Reporting System. The items are numbered sequentially in the practice site.

Grade 5 Math
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Content Summary and Answer Key

Question No.*	Item Type	Content Cluster	Content Standard	Answer Key	Points
18	Equation Item	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (5.NBT.6)	---	1 point
20	Equation Item	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. (5.NF.6)	---	1 point
21	Graphic Response	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? (5.NF.3)*	---	1 point

* The question number matches the item number in the Item Level Report in the Online Reporting System. The items are numbered sequentially in the practice site.

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Content Summary and Answer Key

Question No.*	Item Type	Content Cluster	Content Standard	Answer Key	Points
22	Equation Item	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *(5.NBT.7)*	---	2 points
25	Graphic Response	Graph points on the coordinate plane to solve real-world and mathematical problems.	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). *(5.G.1)*	---	1 point

* The question number matches the item number in the Item Level Report in the Online Reporting System. The items are numbered sequentially in the practice site.

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Question No.*	Item Type	Content Cluster	Content Standard	Answer Key	Points
27	Graphic Response	Analyze patterns and relationships.	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.* (5.OA.3)	---	1 point
29	Multiple Choice	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Fluently multiply multi-digit whole numbers using the standard algorithm. *(5.NBT.5)*	D	1 point
31	Equation Item	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. *(5.MD.5)* b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	---	1 point

* The question number matches the item number in the Item Level Report in the Online Reporting System. The items are numbered sequentially in the practice site.

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Question No.*	Item Type	Content Cluster	Content Standard	Answer Key	Points
34	Graphic Response	Write and interpret numerical expressions.	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. *(5.OA.1)*	---	1 point
35	Equation Item	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. *(5.NF.4)* *b.* Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	---	1 point
36	Multiple Choice	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. *(5.MD.3)* *a.* A cube with side length 1 unit, called a "unit cube", is said to have "one cubic unit" of volume, and can be used to measure volume.	C	1 point
39	Equation Item	Use equivalent fractions as a strategy to add and subtract fractions.	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2. (5.NF.2)*	---	1 point

* The question number matches the item number in the Item Level Report in the Online Reporting System. The items are numbered sequentially in the practice site.

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Content Summary and Answer Key

Question No.*	Item Type	Content Cluster	Content Standard	Answer Key	Points
41	Multi-Select	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Interpret multiplication as scaling (resizing), by: *(5.NF.5)* *a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.*	A, D	1 point
44	Multiple Choice	Understand the place value system.	Use place value understanding to round decimals to any place. *(5.NBT.4)*	B	1 point
45	Graphic Response	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *(5.NF.7)* *c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	---	1 point

* The question number matches the item number in the Item Level Report in the Online Reporting System. The items are numbered sequentially in the practice site.

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Math
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Question 4

Question and Scoring Guidelines

Question 4

A store only sells 20-pound bags of ice. Over the weekend, the store sells 800 bags of ice, making $3,400. On Monday, the store sells 80 bags of ice.

How much money does the store make selling ice on Monday? Enter the number in the box.

$ [   ]

1	2	3
4	5	6
7	8	9
0	.	□/□

Points Possible: 1

Content Cluster: Understand the place value system.

Content Standard: Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. *(5.NBT.1)*

Scoring Guidelines

<u>Exemplar Response</u>

- $340

<u>Other Correct Responses</u>

- Any equivalent value

For this item, a full-credit response includes:

- A correct value (1 point).

Grade 5
Math
Spring 2018 Item Release

Question 4

Sample Responses

Sample Response: 1 point

A store only sells 20-pound bags of ice. Over the weekend, the store sells 800 bags of ice, making $3,400. On Monday, the store sells 80 bags of ice.

How much money does the store make selling ice on Monday? Enter the number in the box.

$ 340

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct amount of money the store makes selling ice on Monday.

- The student may recognize the value of the 8 in 80 represents $\frac{1}{10}$ of the value of the 8 in 800. The student may use this information to reason that 340 represents $\frac{1}{10}$ of 3400.

Sample Response: 1 point

A store only sells 20-pound bags of ice. Over the weekend, the store sells 800 bags of ice, making $3,400. On Monday, the store sells 80 bags of ice.

How much money does the store make selling ice on Monday? Enter the number in the box.

$ | 340.00

1	2	3
4	5	6
7	8	9
0	.	▢/▢

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct amount of money the store makes selling ice on Monday.

- The student may recognize the value of the 8 in 80 represents $\frac{1}{10}$ of the value of the 8 in 800. The student may use this information to reason that $340.00 represents $\frac{1}{10}$ of $3400.00.

Sample Response: 0 points

A store only sells 20-pound bags of ice. Over the weekend, the store sells 800 bags of ice, making $3,400. On Monday, the store sells 80 bags of ice.

How much money does the store make selling ice on Monday? Enter the number in the box.

$ 4.25

| ← | → | ↶ | ↷ | ⌫ |

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect amount of money the store makes selling ice on Monday.

- The student may use division to identify the cost of one bag of ice but not use the information to find the cost of 80 bags of ice.

$$4.00 + 0.20 + 0.05 = 4.25$$

Students in grade 5 are only expected to find whole-number quotients of whole numbers with up to 4-digit dividends and 2-digit divisors. Division with multi-digit numbers does not appear in the standards until grade 6.

Sample Response: 0 points

A store only sells 20-pound bags of ice. Over the weekend, the store sells 800 bags of ice, making $3,400. On Monday, the store sells 80 bags of ice.

How much money does the store make selling ice on Monday? Enter the number in the box.

$ 42.50

1	2	3
4	5	6
7	8	9
0	.	⬚/⬚

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect amount of money the store makes selling ice on Monday.

- The student may think dividing $3400.00 by 80 would determine how much money the store made selling ice on Monday.

$$
\begin{array}{r}
42.50 \\
80 \overline{\smash{)}\ 3400.00} \\
-\ 3200.00 \quad = 80 \times \boxed{40.00} \\
\hline
200.00 \\
-\ 160.00 \quad = 80 \times \boxed{2.00} \\
\hline
40.00 \\
-\ 40.00 \quad = 80 \times \boxed{0.50} \\
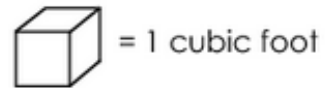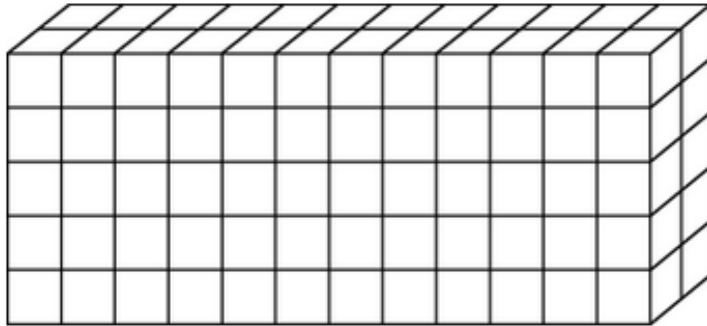\hline
0.00
\end{array}
$$

40.0 + 2.00 + 0.50 = 42.50

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Math
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Question 5

Question and Scoring Guidelines

Question 5

A rectangular prism is shown.

= 1 cubic foot

What is the volume of the prism, in cubic feet?

Ⓐ   60 cubic feet

Ⓑ   100 cubic feet

Ⓒ   120 cubic feet

Ⓓ   180 cubic feet

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Content Standard: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. *(5.MD.4)*

Scoring Guidelines

<u>Rationale for Option A:</u> This is incorrect. The student may count only the visible unit cubes in the front face.

<u>Rationale for Option B:</u> This is incorrect. The student may miscount the width of the prism as 10 cubic units and then identify the volume for a cube with dimensions of 2, 5, and 10.

<u>Rationale for Option C:</u> **Key** – The student accurately considers the full prism, including the unit cubes that are not visible from this perspective.

<u>Rationale for Option D:</u> This is incorrect. The student may count the front face cubes and then add two additional rows instead of just 1 additional row of cubes.

Sample Response: 1 point

A rectangular prism is shown.
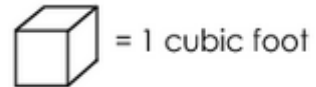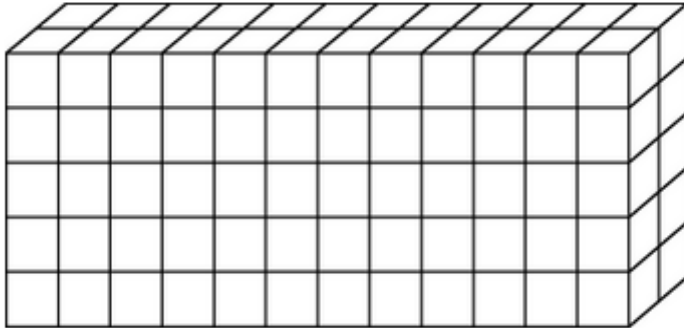
= 1 cubic foot

What is the volume of the prism, in cubic feet?

Ⓐ   60 cubic feet

Ⓑ   100 cubic feet

●   120 cubic feet

Ⓓ   180 cubic feet

Grade 5
Math
Spring 2018 Item Release

Question 8

Question and Scoring Guidelines

Question 8

Select the **two** numbers whose values are between 34.6 and 35.23.

- ☐ 34.230
- ☐ 34.65
- ☐ 35.223
- ☐ 35.32
- ☐ 35.6

Points Possible: 1

Content Cluster: Understand the place value system.

Content Standard: Read, write, and compare decimals to thousandths. *(5.NBT.3)*
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Scoring Guidelines

Rationale for First Option: This is incorrect. The student may think that 34.230 is larger than 34.6 because it has more digits.

Rationale for Second Option: **Key** – The student correctly identifies a number between 34.6 and 35.23.

Rationale for Third Option: **Key** – The student correctly identifies a number between 34.6 and 35.23.

Rationale for Fourth Option: This is incorrect. The student may think that 35.23 and 35.32 are equal and therefore fall within the range.

Rationale for Fifth Option: This is incorrect. The student may think that 35.6 is within the range since it has the same whole number as 35.23 and the same decimal as 34.6.

Sample Response: 1 point

Select the **two** numbers whose values are between 34.6 and 35.23.

- ☐ 34.230
- ☑ 34.65
- ☑ 35.223
- ☐ 35.32
- ☐ 35.6

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Question 17

Question and Scoring Guidelines

Question 17

An equation is shown.

$$\frac{5}{9} - \square = \frac{12}{54}$$

What is the missing fraction in the equation? Enter the fraction in the box.

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Points Possible: 1

Content Cluster: Use equivalent fractions as a strategy to add and subtract fractions.

Content Standard: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/(bd).) (5.NF.1)*

Scoring Guidelines

<u>Exemplar Response</u>

- $\frac{3}{9}$

<u>Other Correct Responses</u>

- Any equivalent value

For this item, a full-credit response includes:

- A correct value (1 point).

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Question 17

Sample Responses

Sample Response: 1 point

An equation is shown.

$$\frac{5}{9} - \square = \frac{12}{54}$$

What is the missing fraction in the equation? Enter the fraction in the box.

$$\frac{3}{9}$$

| ← | → | ↶ | ↷ | ⌫ |

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct missing value for the equation.

- The student may reduce $\frac{12}{54}$ to a simpler equivalent fraction before subtracting to find the missing value.

$$\frac{5}{9} - \Box = \frac{12}{54}$$

$$\frac{12}{54} \div \frac{6}{6} = \frac{2}{9} \qquad \text{AND} \qquad \frac{5}{9} \div \frac{1}{1} = \frac{5}{9}$$

$$\frac{5}{9} - \Box = \frac{2}{9}$$

$$\frac{5}{9} - \frac{2}{9} = \Box$$

$$\Box = \frac{3}{9}$$

$$\frac{5}{9} - \frac{3}{9} = \frac{2}{9} \qquad \text{AND} \qquad \frac{5}{9} - \frac{3}{9} = \frac{12}{54}$$

Sample Response: 1 point

An equation is shown.

$$\frac{5}{9} - \square = \frac{12}{54}$$

What is the missing fraction in the equation? Enter the fraction in the box.

$$\frac{18}{54}$$

←	→	↶	↷	⌫

1	2	3
4	5	6
7	8	9
0	.	▯/▯

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct missing value for the equation.

- The student may find a common denominator, create equivalent fractions, and then subtract to find the missing value.

$$\frac{5}{9} - \square = \frac{12}{54}$$

$$\frac{5}{9} \times \frac{6}{6} = \frac{30}{54} \qquad \text{AND} \qquad \frac{12}{54} \times \frac{1}{1} = \frac{12}{54}$$

$$\frac{30}{54} - \square = \frac{12}{54}$$

$$\frac{30}{54} - \frac{12}{54} = \square$$

$$\square = \frac{18}{54}$$

$$\frac{30}{54} - \frac{18}{54} = \frac{12}{54} \qquad \text{AND} \qquad \frac{5}{9} - \frac{18}{54} = \frac{12}{54}$$

Sample Response: 0 points

An equation is shown.

$$\frac{5}{9} - \square = \frac{12}{54}$$

What is the missing fraction in the equation? Enter the fraction in the box.

$$\frac{23}{54}$$

← → ↶ ↷ ⊗

1	2	3
4	5	6
7	8	9
0	.	▯/▯

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect missing value for the equation.

- The student may find a common denominator but create one inequivalent fraction and then add instead of subtract to find the missing value.

$$\frac{5}{9} - \square = \frac{12}{54}$$

$$\frac{5}{9} \times \frac{6}{6} \neq \frac{11}{54} \qquad \text{AND} \qquad \frac{12}{54} \times \frac{1}{1} = \frac{12}{54}$$

$$\frac{11}{54} - \square = \frac{12}{54}$$

$$\frac{11}{54} + \frac{12}{54} = \square$$

$$\square = \frac{23}{54}$$

$$\frac{11}{54} - \frac{23}{54} \neq \frac{12}{54} \qquad \text{AND} \qquad \frac{5}{9} - \frac{23}{54} \neq \frac{12}{54}$$

Sample Response: 0 points

An equation is shown.

$$\frac{5}{9} - \square = \frac{12}{54}$$

What is the missing fraction in the equation? Enter the fraction in the box.

$$\frac{7}{9}$$

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect missing value for the equation.

- The student may reduce $\frac{12}{54}$ then add instead of subtract to find the missing value.

$$\frac{5}{9} - \square = \frac{12}{54}$$

$\frac{12}{54} \div \frac{6}{6} = \frac{2}{9}$ AND $\frac{5}{9} \div \frac{1}{1} = \frac{5}{9}$

$$\frac{5}{9} - \square = \frac{2}{9}$$

$$\frac{5}{9} + \frac{2}{9} = \square$$

$$\square = \frac{7}{9}$$

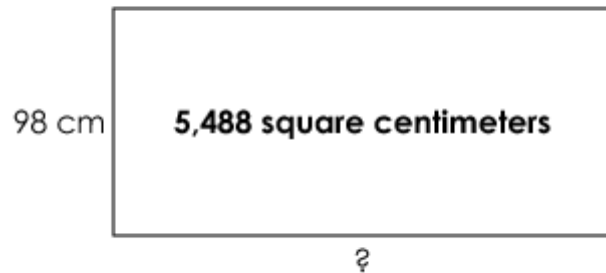$\frac{5}{9} - \frac{7}{9} \neq \frac{2}{9}$ AND $\frac{5}{9} - \frac{7}{9} \neq \frac{12}{54}$

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Math
Spring 2018 Item Release

Question 18

Question and Scoring Guidelines

Question 18

A rectangle with a missing side length is shown.

98 cm	**5,488 square centimeters**

?

Enter the value, in centimeters (cm), of the missing side length.

[ ] *centimeters*

←	→	↶	↷	⌫

1	2	3
4	5	6
7	8	9
0	.	▢/▢

Points Possible: 1

Content Cluster: Perform operations with multi-digit whole numbers and with decimals to hundredths.

Content Standard: Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. *(5.NBT.6)*

Scoring Guidelines

<u>Exemplar Response</u>

- 56 centimeters

<u>Other Correct Responses</u>

- Any equivalent value

For this item, a full-credit response includes:

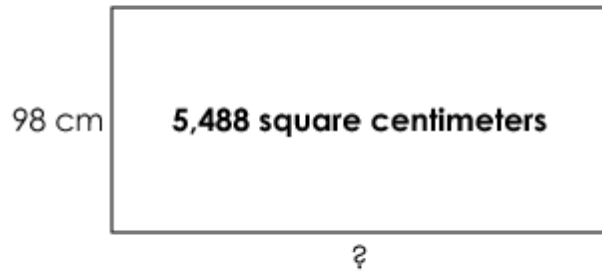- The correct value (1 point).

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Math
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Question 18

Sample Responses

Sample Response: 1 point

A rectangle with a missing side length is shown.

98 cm | **5,488 square centimeters**

?

Enter the value, in centimeters (cm), of the missing side length.

56 *centimeters*

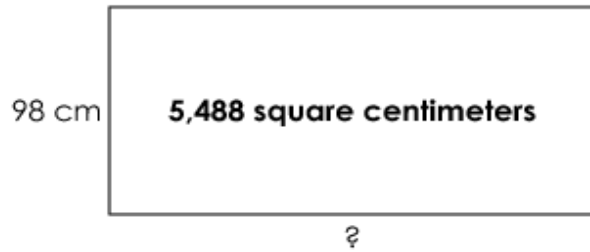| 1 | 2 | 3 |
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct missing side length for the rectangle.

- The student may use an area model to divide 5488 by 98.

50	+	6	= 56 centimeters
98 × 50 = 4900		98 x 6 = 588	
$^{4}5^{1}488$		588	
− 4 900		− 588	
588		0	

(98 is labeled to the left of the area model)

Sample Response: 1 point

A rectangle with a missing side length is shown.

98 cm | **5,488 square centimeters**

?

Enter the value, in centimeters (cm), of the missing side length.

$$\frac{5488}{98}$$ *centimeters*

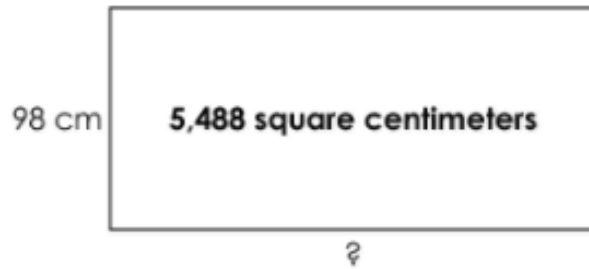| 1 | 2 | 3 |
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct missing side length for the rectangle.

- The student may use the correct operation to find the missing side length and write the answer as a fraction equivalent to 56.

$5488 \div 98 = \dfrac{5488}{98}$

Sample Response: 0 points

A rectangle with a missing side length is shown.

| 98 cm | **5,488 square centimeters** |

?

Enter the value, in centimeters (cm), of the missing side length.

5390   *centimeters*

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

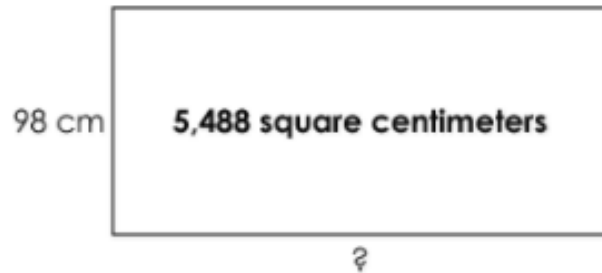This response earns no credit (0 points) because it identifies an incorrect missing side length for the rectangle.

- The student may subtract 98 from 5488 rather than dividing 5488 by 98.

$$5 \ ^3\cancel{4} \ ^188$$
$$- \ \ \ \ \ \ \ \ \ \ 98$$
$$\overline{5 \ \ 3 \ \ \ 90}$$

$5488 \div 98 \neq 5390$

Sample Response: 0 points

A rectangle with a missing side length is shown.

98 cm | 5,488 square centimeters

?

Enter the value, in centimeters (cm), of the missing side length.

2646 *centimeters*

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect missing side length for the rectangle.

- The student may think 5488 square centimeters is the perimeter of the rectangle instead of the area.

$98 \times 2 = 196$

$$5\,^34\,^188$$
$$-\quad 1\ 96$$
$$\overline{5\ 2\ 92}$$

```
              2646
       2 |  5292
          - 4000    = 2 x   2000
            1292
          - 1200    = 2 ×    600
              92
          -   80    = 2 ×     40
              12
          -   12    = 2 ×      6
               0
```

$2000 + 600 + 40 + 6 = 2646$
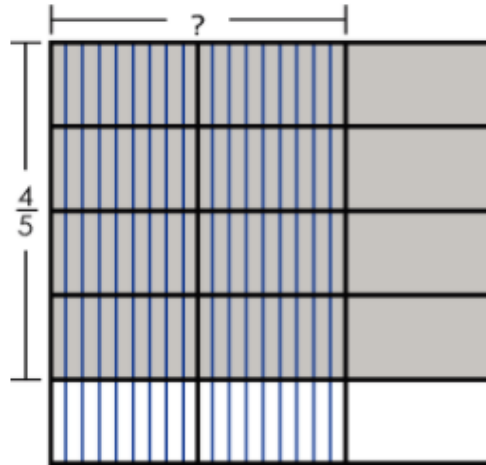
$5488 \div 98 \neq 2646$

45 (2018)

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Math
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Question 20

Question and Scoring Guidelines

Question 20

A fraction model that represents a multiplication expression is shown.

Enter the missing factor and the product.

Factor: [   ]

Product: [   ]

1	2	3
4	5	6
7	8	9
0	.	□/□

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Content Standard: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *(5.NF.6)*

Scoring Guidelines

<u>Exemplar Response</u>

- Factor: $\frac{2}{3}$
- Product: $\frac{8}{15}$

<u>Other Correct Responses</u>

- Any equivalent values

For this item, a full-credit response includes:
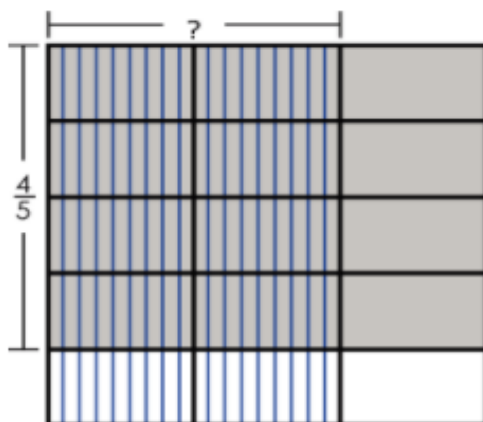
- A correct factor and product (1 point).

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Question 20

Sample Responses

Sample Response: 1 point

A fraction model that represents a multiplication expression is shown.

Enter the missing factor and the product.

Factor: $\dfrac{2}{3}$

Product: $\dfrac{8}{15}$

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct missing factor and product.

- The student may identify the factor of $\frac{2}{3}$ using the model and then multiply $\frac{2}{3} \times \frac{4}{5}$ to find the product.

$$\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$$

Sample Response: 1 point

A fraction model that represents a multiplication expression is shown.

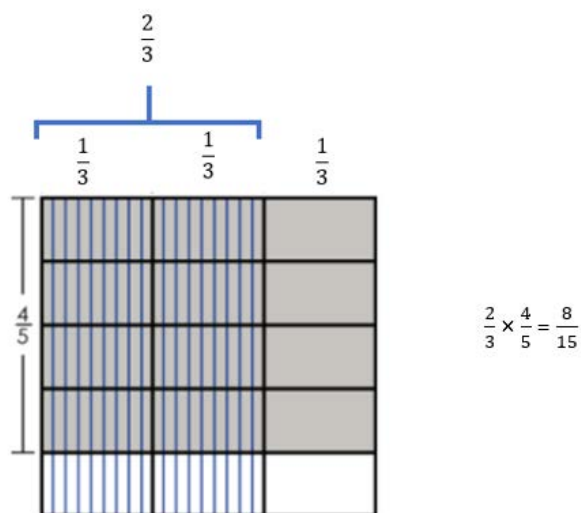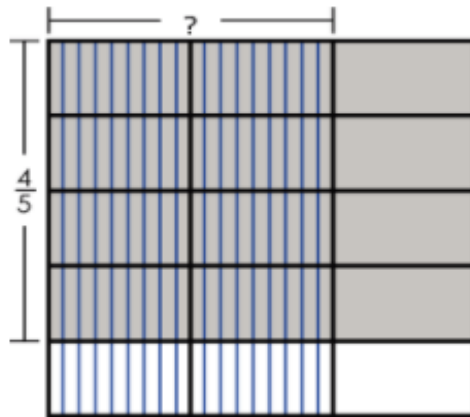Enter the missing factor and the product.

Factor: $\dfrac{4}{6}$

Product: $\dfrac{16}{30}$

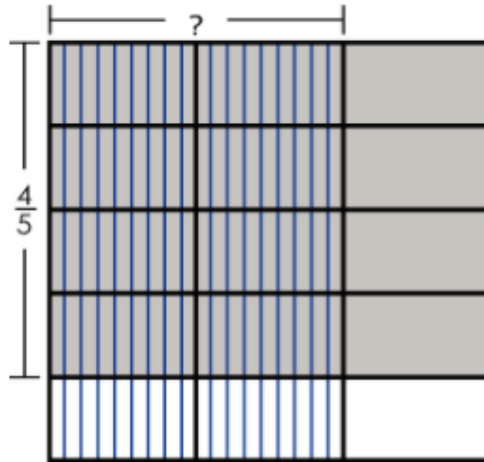| 1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct missing factor and product.

- The student may identify $\frac{4}{6}$ as an equivalent value to the missing factor of $\frac{2}{3}$ and then multiply $\frac{4}{6} \times \frac{4}{5}$ and find an equivalent value to the product.

Sample Response: 0 points

A fraction model that represents a multiplication expression is shown.

Enter the missing factor and the product.

Factor: 8

Product: 14

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect missing factor and product.

- The student may identify the number of shaded squares with lines as the factor and the total number of shaded squares plus lined squares as the product.

Sample Response: 0 points

A fraction model that represents a multiplication expression is shown.

Enter the missing factor and the product.

Factor: $\frac{2}{3}$
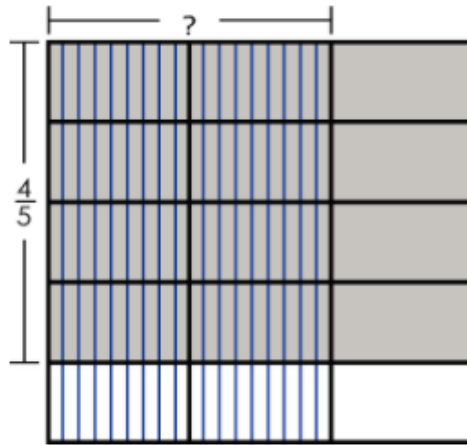
Product: 8

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Notes on Scoring

This response earns no credit (0 points) because it identifies a correct missing factor but an incorrect product.

- The student may think the product is the total number of squares that are shaded gray with lines without recognizing the 8 lined, gray squares as a part of the whole.

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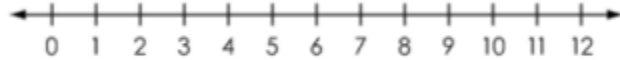
Question 21

Question and Scoring Guidelines

Question 21

An expression is given.

$50 \div 6$

Estimate the value of the expression.

Select the section on the number line to show the two numbers that your estimate lies between.

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Content Standard: Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? (5.NF.3)*

Scoring Guidelines

<u>Exemplar Response</u>

<u>Other Correct Responses</u>

- N/A

For this item, a full-credit response includes:

- The correct selection (1 point).

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Question 21

Sample Responses

Sample Response: 1 point

An expression is given.

$50 \div 6$

Estimate the value of the expression.

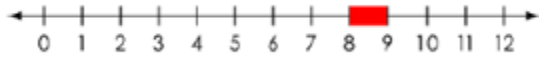Select the section on the number line to show the two numbers that your estimate lies between.

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct estimate for the expression 50 ÷ 6.

- The student may use a table to estimate the quotient of 50 and 6.

60	÷ 6 =	10
54	**÷ 6 =**	**9**
48	**÷ 6 =**	**8**
42	÷ 6 =	7
36	÷ 6 =	6

50 is between 48 and 54; therefore, the quotient of 50 and 6 is somewhere between 8 and 9.

Sample Response: 0 points

An expression is given.

$50 \div 6$

Estimate the value of the expression.

Select the section on the number line to show the two numbers that your estimate lies between.
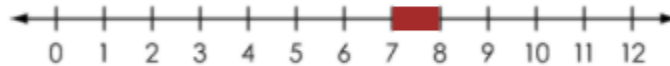
Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect estimate for the expression 50 ÷ 6.

- The student may use a table to estimate the quotient of 50 and 6 but incorrectly recall the division facts for 6.

63	÷ 6 ≠	9
56	**÷ 6 ≠**	**8**
49	**÷ 6 ≠**	**7**
42	÷ 6 ≠	6
35	÷ 6 ≠	5

Based on the student's table, 50 is between 49 and 56; therefore, the quotient of 50 and 6 is somewhere between 7 and 8 instead of 8 and 9.
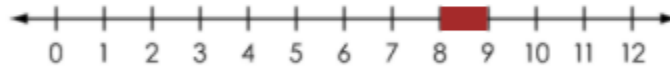
Sample Response: 0 points

An expression is given.

$50 \div 6$

Estimate the value of the expression.

Select the section on the number line to show the two numbers that your estimate lies between.
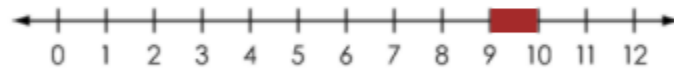
Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect estimate for the expression 50 ÷ 6.

- The student may use a table to estimate the quotient of 50 and 6 but incorrectly recall the division facts for 6.

60	÷ 6 ≠	12
55	÷ 6 ≠	11
50	**÷ 6 ≠**	**10**
45	**÷ 6 ≠**	**9**
40	÷ 6 ≠	8

Based on the student's table, 50 is between 45 and 50; therefore, the quotient of 50 and 6 is somewhere between 9 and 10 instead of between 8 and 9.

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Question 22

Question and Scoring Guidelines

Question 22

A student orders food from the menu shown.

Menu

Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.

A. $ [   ]

B. $ [   ]

1	2	3
4	5	6
7	8	9
0	.	▭

Points Possible: 2

Content Cluster: Perform operations with multi-digit whole numbers and with decimals to hundredths.

Content Standard: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *(5.NBT.7)*

Scoring Guidelines

<u>Exemplar Response</u>

- $6.75
- $3.25

<u>Other Correct Responses</u>

- Any equivalent value
- The student may receive partial credit for calculating the correct change based on an incorrect answer in part A.

For this item, a full-credit response includes:

- The correct response in part A (1 point);
  AND
- The correct response in part B (1 point).

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Question 22

Sample Responses

Sample Response: 2 points

A student orders food from the menu shown.

Menu

Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.

A. $ 6.75

B. $ 3.25

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns full credit (2 points) because it identifies the correct cost of 2 hamburgers, 1 bag of chips, and 1 soda; it also identifies the correct amount of change from a $10 bill.

- The student may use addition strategies based on place value to identify the cost of 2 hamburgers, 1 bag of chips, and 1 soda.
- The student may use subtraction to identify the amount of change from a $10 bill.

$2.25 + 2.25 + 0.75 + 1.50$
$= 2.25 + (2.25 + 0.75) + 1.50$
$= 2.25 + \quad (3.00 \quad + 1.50)$
$= 2.25 + \qquad 4.50$
$= 6.75$

$\$2.25 + \$2.25 + \$0.75 + \$1.50 = \$6.75$

$$\begin{array}{r} {}^{9}\cancel{10}.{}^{9}\cancel{0}\,{}^{1}0 \\ - 6.7\;5 \\ \hline 3.2\;5 \end{array}$$

$\$10.00 - \$6.75 = \$3.25$

Sample Response: 2 points

A student orders food from the menu shown.

Menu	
Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.

A. $ $6\frac{3}{4}$

B. $ $3\frac{1}{4}$

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns full credit (2 points) because it identifies the correct cost of 2 hamburgers, 1 bag of chips, and 1 soda; it also identifies the correct amount of change from a $10 bill.

- The student may count on using a number line to identify an equivalent value for the cost of 2 hamburgers, 1 bag of chips, and 1 soda.
- The student may count on from $6\frac{3}{4}$ using a number line to identify the amount of change from a $10 bill.

Sample Response: 1 point

A student orders food from the menu shown.

Menu

Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.
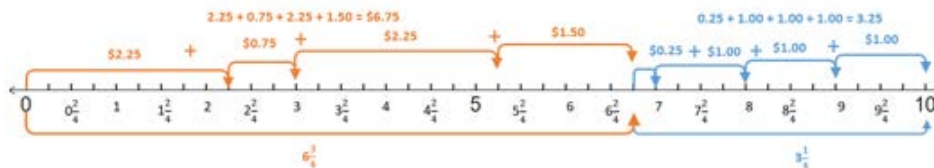
A. $ 4.50

B. $ 5.50

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns partial credit (1 point) because it identifies the incorrect cost of 2 hamburgers, 1 bag of chips, and 1 soda; however, it identifies the correct amount of change from a $10 bill based on the incorrect total given in Part A.

- The student may think they only need to find the cost of the 1 hamburger, 1 bag of chips, and 1 soda instead of the total cost of all the items.
- The student may use a model to find the amount of change from a $10 bill based on their response in Part A.

Sample Response: 1 point

A student orders food from the menu shown.

Menu

Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.

A. $ 6.75

B. $ 4.25

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns partial credit (1 point) because it identifies the correct cost for 2 hamburgers, 1 bag of chips, and 1 soda; however, it identifies the incorrect amount of change from a $10 bill.

- The student may use addition and multiplication to identify the cost of 2 hamburgers, 1 bag of chips, and 1 soda.
- The student may make a regrouping error when subtracting to identify the amount of change from a $10 bill.

$$2.25 + 2.25 + (0.75 + 1.50)$$
$$= 2.25 + 2.25 + (2.25)$$
$$= (2 + 2 + 2) + (0.25 + 0.25 + 0.25)$$
$$= (3 \times 2) + (3 \times 0.25)$$
$$= (6) + (0.75)$$
$$= 6.75$$

$$\$2.25 + \$2.25 + \$0.75 + \$1.50 = \$6.75$$

$$10.\overset{9}{\cancel{0}}\,{}^{1}0$$
$$-\ \underline{6.7\ 5}$$
$$4.2\ 5$$

$$\$10.00 - \$6.75 \ne \$4.25$$

Sample Response: 0 points

A student orders food from the menu shown.

Menu

Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.

A. $ 4.50

B. $ 14.50

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect cost for 2 hamburgers, 1 bag of chips, and 1 soda; it also identifies the incorrect amount of change from a $10 bill.

- The student may think they only need to find the cost of 2 hamburgers.
  2.25 + 2.25
  = 2 + 0.25 + 2 + 0.25
  = (2 + 2) + (0.25 + 0.25)
  =   4   +   0.50
  = 4.50
  2.25 + 2.25 + 0.75 + 1.50 ≠ 4.50
- The student may add the answer from Part A to $10 instead of subtracting it.

  10.00
  + 4.50
  14.50

  10.00 − 4.50 ≠ 14.50

Sample Response: 0 points

A student orders food from the menu shown.

Menu

Hotdog	$1.75
Hamburger	$2.25
Popcorn	$1.25
Chips	$0.75
Soda	$1.50
Water	$1.25

A. What is the cost of 2 hamburgers, 1 bag of chips, and 1 soda? Enter the number in the first box.

B. How much change will the student receive if he pays with a $10 bill? Enter the number in the second box.

A. $ 6.50

B. $ 16.50

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect cost for 2 hamburgers, 1 bag of chips, and 1 soda; it also identifies the incorrect amount of change from a $10 bill.

- The student may use addition strategies based on place value but add incorrectly.

2.25 + 2.25 + 0.75 + 1.50
= 2.25 + 0.75 + (2.25 + 1.50)
= 2.25 + (0.75 + 3.75)
= 2.25 +   4.50
≠ 6.50

- The student may add the answer from Part A to $10 instead of subtracting it.

```
  10.00
+  6.50
  16.50
```
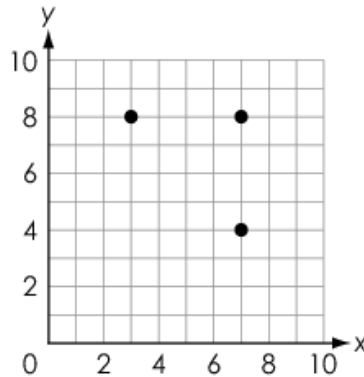
$10.00 - 6.50 \neq 16.50$

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Question 25

Question and Scoring Guidelines

Question 25

A student is plotting points to create a square. Three of the points are already shown.

Enter the coordinates of the other corner of the square.

(⬚ , ⬚)

Points Possible: 1

Content Cluster: Graph points on the coordinate plane to solve real-world and mathematical problems.

Content Standard: Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). *(5.G.1)*

Scoring Guidelines

<u>Exemplar Response</u>

- (3, 4)

<u>Other Correct Responses</u>

- N/A

For this item, a full-credit response includes:
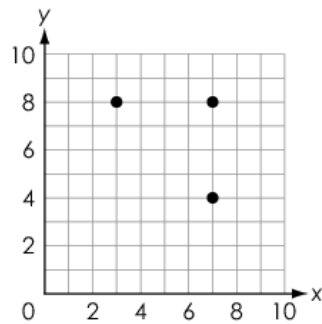
- A correct ordered pair (1 point).

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Question 25

Sample Responses

Sample Response: 1 point

A student is plotting points to create a square. Three of the points are already shown.

Enter the coordinates of the other corner of the square.

(3 , 4)

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct coordinates of the fourth corner of the square.

- The student may count across the x-axis and y-axis to find the length and width of the square to find the missing coordinates for the fourth corner of the square.

Sample Response: 1 point

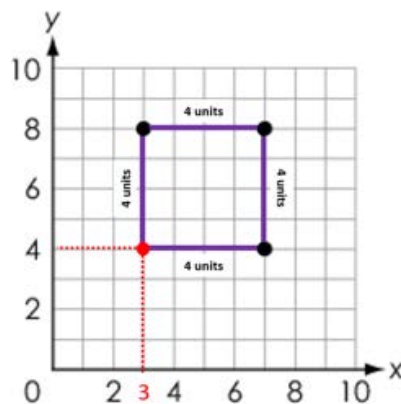A student is plotting points to create a square. Three of the points are already shown.

Enter the coordinates of the other corner of the square.

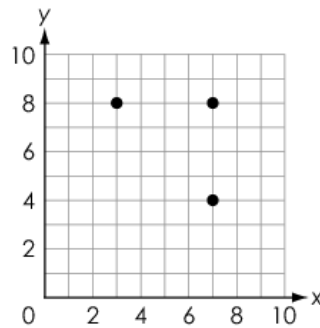(3.0 , 4.0)

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct coordinates of the fourth corner of the square.

- The student may count across the x-axis and y-axis to find the length and width of the square to find the equivalent values to the missing coordinates for the fourth corner of the square.

While decimals are introduced in the standards in grade 4, students are only expected to plot points on the coordinate plane with whole number coordinates in grade 5. A student can earn credit in grade 5 by identifying an equivalent value to a correct response.

Sample Response: 0 points

A student is plotting points to create a square. Three of the points are already shown.
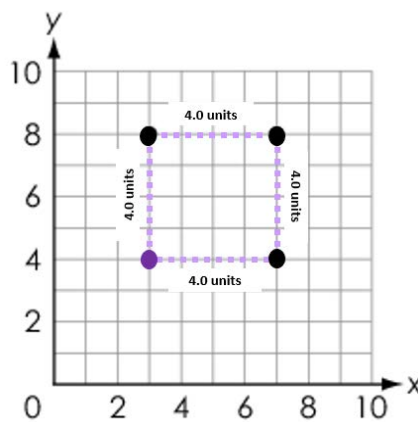

Enter the coordinates of the other corner of the square.

(7 , 8)
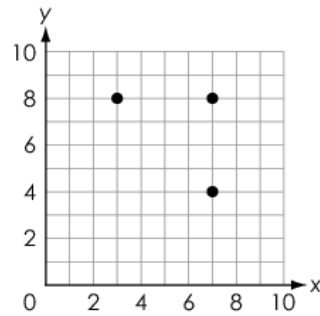
Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect coordinates of the fourth corner of the square.

- The student may think the question is asking for the coordinates of the corner of the square that is shown instead of the missing corner.

Sample Response: 0 points

A student is plotting points to create a square. Three of the points are already shown.

Enter the coordinates of the other corner of the square.

(2 , 4)

Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect coordinates of the fourth corner of the square.
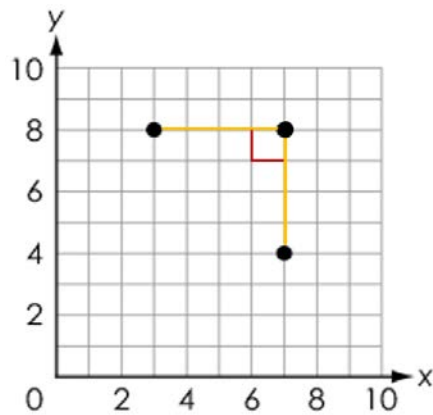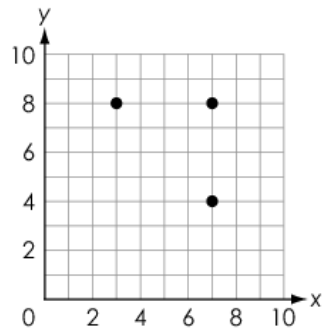
- The student may count from the coordinate (7,4) and move to the left 5 units rather than 4 units.
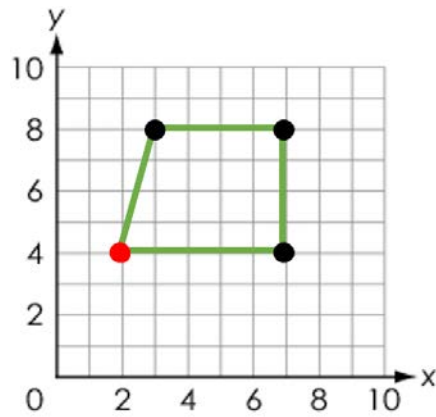
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Question 27

Question and Scoring Guidelines

Question 27

Pattern X and Pattern Y have the same first term.

- Pattern X uses the rule "Add 1."

- Pattern Y uses the rule "Add 6."

Complete the table to show the next two terms in each pattern.

| Pattern X | 1 | , | | , | |
| Pattern Y | 1 | , | | , | |

Points Possible: 1

Content Cluster: Analyze patterns and relationships.

Content Standard: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so. (5.OA.3)*

Scoring Guidelines

<u>Exemplar Response</u>

X	1	2	3
Y	1	7	13

<u>Other Correct Responses</u>

- N/A

For this item, a full-credit response includes:

- A correct table (1 point).

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Question 27

Sample Responses

Sample Response: 1 point

Pattern X and Pattern Y have the same first term.

- Pattern X uses the rule "Add 1."

- Pattern Y uses the rule "Add 6."

Complete the table to show the next two terms in each pattern.

| Pattern X | 1 | , | 2 | , | 3 |
| Pattern Y | 1 | , | 7 | , | 13 |

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the next two terms in each pattern.

- The student may add 1 to each term for pattern X and add 6 to each term for pattern Y.

Sample Response: 1 point

Pattern X and Pattern Y have the same first term.

- Pattern X uses the rule "Add 1."

- Pattern Y uses the rule "Add 6."

Complete the table to show the next two terms in each pattern.

Pattern X	1	,	2.0	,	3.0
Pattern Y	1	,	7.0	,	13.0

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the next two terms in each pattern.

- The student found correct equivalent values for each term in pattern X and pattern Y.

	1.0 + 1.0 = 2.0	2.0 + 1.0 = 3.0

Pattern X	1	,	2.0	,	3.0
Pattern Y	1	,	7.0	,	13.0

	1.0 + 6.0 = 7.0	7.0 + 6.0 = 13.0

Sample Response: 0 points

Pattern X and Pattern Y have the same first term.

- Pattern X uses the rule "Add 1."

- Pattern Y uses the rule "Add 6."

Complete the table to show the next two terms in each pattern.

| Pattern X | 1 | , | 2 | , | 2 |
| Pattern Y | 1 | , | 7 | , | 7 |

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the third term in both patterns.

- The student may add incorrectly to find the third term in both patterns.
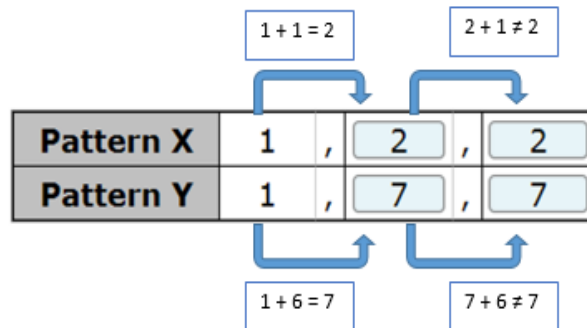
Sample Response: 0 points

Pattern X and Pattern Y have the same first term.

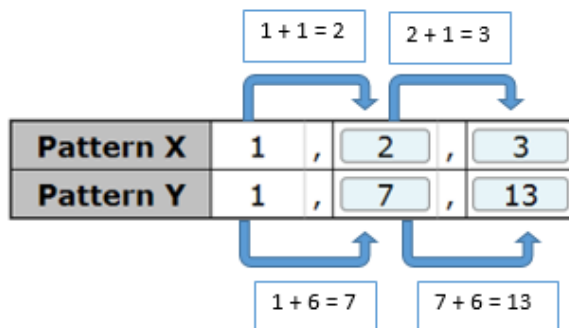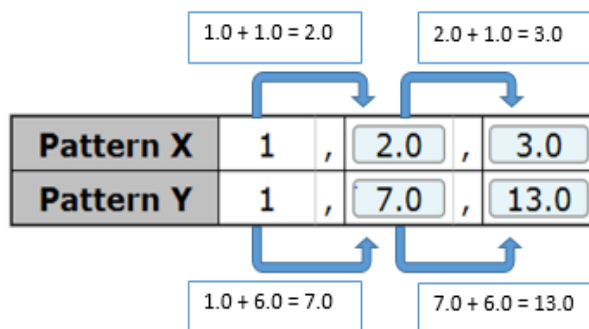- Pattern X uses the rule "Add 1."

- Pattern Y uses the rule "Add 6."

Complete the table to show the next two terms in each pattern.

Pattern X	1	,	1	,	2
Pattern Y	1	,	6	,	12

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the next two terms in both patterns.

- The student may use the rule as the starting point and ignore the value of the first term in the pattern.

	$0+1=1$	$1+1=2$

Pattern X	1	,	1	,	2
Pattern Y	1	,	6	,	12

	$0+6=6$	$6+6=12$
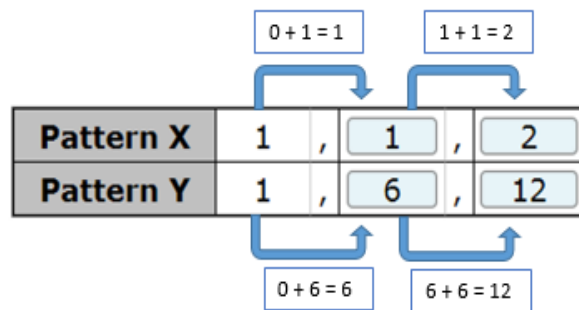
Grade 5
Math
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Question 29

Question and Scoring Guidelines

Question 29

An equation is shown.

$1{,}074 \times 64 = \square$

What is the missing number?

Ⓐ 10,740

Ⓑ 64,536

Ⓒ 65,136

Ⓓ 68,736

Points Possible: 1

Content Cluster: Perform operations with multi-digit whole numbers and with decimals to hundredths.

Content Standard: Fluently multiply multi-digit whole numbers using the standard algorithm. *(5.NBT.5)*

Scoring Guidelines

Rationale for Option A: This is incorrect. The student may forget a place holder when multiplying by the tens factor.

Rationale for Option B: This is incorrect. The student may forget to regroup when adding the partial products.

Rationale for Option C: This is incorrect. The student may incorrectly calculate one or both of the partial products.

Rationale for Option D: **Key** – The student correctly calculates the product.

Sample Response: 1 point

An equation is shown.

$1,074 \times 64 = \square$

What is the missing number?

- Ⓐ 10,740
- Ⓑ 64,536
- Ⓒ 65,136
- Ⓓ 68,736

Grade 5
Math
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Question 31

Question and Scoring Guidelines

Question 31

Descriptions of two shapes are given.

- Shape 1: A cube with a side length of 6 centimeters.

- Shape 2: A right rectangular prism with the same volume as shape 1, but a different length, width, and height.

Enter a possible length, width, and height for shape 2.

Length: _____ *centimeters*

Width: _____ *centimeters*

Height: _____ *centimeters*

1	2	3
4	5	6
7	8	9
0	.	$\frac{\Box}{\Box}$

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Content Standard: Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. *(5.MD.5)*
b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Scoring Guidelines

<u>Exemplar Response</u>

- Length: 4 centimeters
  Width: 2 centimeters
  Height: 27 centimeters

<u>Other Correct Responses</u>

- Any three dimensions other than 6 centimeters whose product is 216
- Any three unique dimensions (can include 6) whose product is 216

For this item, a full-credit response includes:

- Three correct dimensions (1 point).

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Math
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Question 31

Sample Responses

Sample Response: 1 point

Descriptions of two shapes are given.

- Shape 1: A cube with a side length of 6 centimeters.
- Shape 2: A right rectangular prism with the same volume as shape 1, but a different length, width, and height.

Enter a possible length, width, and height for shape 2.

Length: `2` *centimeters*

Width: `2` *centimeters*

Height: `54` *centimeters*

1	2	3
4	5	6
7	8	9
0	.	▯/▯

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct length, width, and height for shape 2.

- The student may use the relationship between multiplication and division to find three values that multiply to 216 where one of the values is not 6.

Shape 1	Shape 2	
$6 \times 6 \times 6$	$\dfrac{216}{②} = 108$	$2 \times 2 \times 54$
$= (6 \times 6) \times 6$		$= (2 \times 2) \times 54$
$= (36) \times 6$	$\dfrac{108}{②} = ⑤④$	$= \quad (4) \ \times 54$
$= (30 + 6) \times 6$		$= 4 \times (50 + 4)$
$= (30 \times 6) + (6 \times 6)$		$= (4 \times 50) + (4 \times 4)$
$= (180) + (36)$		$= \quad (200) \ + \ (16)$
$= 216$ *cubic cm*		$= 216$ *cubic cm*

Sample Response: 1 point

Descriptions of two shapes are given.

- Shape 1: A cube with a side length of 6 centimeters.

- Shape 2: A right rectangular prism with the same volume as shape 1, but a different length, width, and height.

Enter a possible length, width, and height for shape 2.

Length: 8   *centimeters*

Width: 3   *centimeters*

Height: 9   *centimeters*

1	2	3
4	5	6
7	8	9
0	.	▯/▯

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct length, width, and height for shape 2.

- The student may use the relationship between multiplication and division to find three values that multiply to 216 where one of the values is not 6.

Shape 1	Shape 2	
$6 \times 6 \times 6$ $= 36 \times 6$ 36 $\times \ \ 6$ 36 $+ 180$ 216 *cubic cm*	72 3) 216 $- 210 \quad = 3 \times \boxed{70}$ 6 $- \ \ \ 6 \quad = 3 \times \boxed{\ 2}$ 0 $70 + 2 = 72$ $72 \div 9 = 8$	$3 \times 8 \times 9$ $= (3 \times 8) \times 9$ $= (24) \times 9$ 24 $\times \ \ 9$ $180 = 20 \times 9$ $+ \ 36 = \ \ 4 \times 9$ 216 *cubic cm*

Sample Response: 0 points

Descriptions of two shapes are given.

- Shape 1: A cube with a side length of 6 centimeters.

- Shape 2: A right rectangular prism with the same volume as shape 1, but a different length, width, and height.

Enter a possible length, width, and height for shape 2.

Length: 6   *centimeters*

Width: 6   *centimeters*

Height: 6   *centimeters*

1	2	3
4	5	6
7	8	9
0	.	░/░

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect length, width, and height for shape 2.

- The student finds the same length, width, and height for shape 2 as shape 1 instead of a different length, width, and height.

Sample Response: 0 points

Descriptions of two shapes are given.

- Shape 1: A cube with a side length of 6 centimeters.

- Shape 2: A right rectangular prism with the same volume as shape 1, but a different length, width, and height.

Enter a possible length, width, and height for shape 2.

Length: [200] *centimeters*

Width: [8] *centimeters*

Height: [8] *centimeters*

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect length, width, and height for shape 2.

- The student may add three dimensions that equal 216 rather than multiply the three dimensions to equal 216.

Shape 1	Shape 2
$6 \times 6 \times 6 = 36 \times 6$ $1 \times 36 = 36$ $2 \times 36 = 72$ $4 \times 36 = 144$ $8 \times 36 = 288$ $(4 + 2) \times 36$ $= (4 \times 36) + (2 \times 36)$ $= (144) + (72)$ $= 216$ *cubic cm*	*Length: 200 cm* *Width: 8 cm* *Height: 8 cm* $200 + 8 + 8 = 216$ *cm* $200 \times 8 \times 8 \neq 216$ *cubic cm*

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Question 34

Question and Scoring Guidelines

Question 34

An expression with missing operation symbols is shown.

Place operation symbols in the blank boxes so that the value of the expression is 55.

- You may use each operation symbol more than once.

+
−
×
÷

(•) Delete   ✕

30 [ ] (3 [ ] 12) [ ] 11

Points Possible: 1

Content Cluster: Write and interpret numerical expressions.

Content Standard: Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. *(5.OA.1)*

Scoring Guidelines

<u>Exemplar Response</u>

30 ⟦+⟧ (3 ⟦×⟧ 12) ⟦−⟧ 11

<u>Other Correct Responses</u>

- N/A

For this item, a full-credit response includes:

- Correctly placing the operation symbols in the boxes (1 point).

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Math
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Question 34

Sample Responses

Sample Response: 1 point

An expression with missing operation symbols is shown.

Place operation symbols in the blank boxes so that the value of the expression is 55.

- You may use each operation symbol more than once.

+
−
×
÷

Delete ✕

$$30 + (3 \times 12) - 11$$

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct operation symbols so the value of the expression is 55.

- The student may perform the multiplication inside the parenthesis before adding 30 and subtracting 11.

$30 + (3 \times 12) - 11$

$= 30 + (36) - 11$

$= 66 - 11$

$= 55$

Sample Response: 1 point

An expression with missing operation symbols is shown.

Place operation symbols in the blank boxes so that the value of the expression is 55.

- You may use each operation symbol more than once.

$+$

$-$

$\times$

$\div$

⊘ Delete ✕

$+$

$\times$

$-$

$30 \ + \ (\ 3 \ \times \ 12\ ) \ - \ 11$

$\div$

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct operation symbols so the value of the expression is 55.

- The student identifies the symbols so the value of the expression is 55. The extra symbols on the grid located outside of the answer boxes (⬚) are not included in the scoring.

Sample Response: 0 points

An expression with missing operation symbols is shown.

Place operation symbols in the blank boxes so that the value of the expression is 55.

- You may use each operation symbol more than once.

+
−
×
÷

Delete

$$30 + (3 + 12) + 11$$

Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect operation symbols, so the value of the expression is not 55.

- The student may add all the values together to get 56 instead of 55.

$30 + (3 + 12) + 11$

$= 30 + (15) + 11$

$= 30 + 26$

$= 56$

$55 \neq 56$

Sample Response: 0 points

An expression with missing operation symbols is shown.

Place operation symbols in the blank boxes so that the value of the expression is 55.

- You may use each operation symbol more than once.

$$+$$
$$-$$
$$\times$$
$$\div$$

Delete ✕

$$30 + (3 \times 12) + 11$$

Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect operation symbols, so the value of the expression is not 55.

- The student may add 11 instead of subtracting 11.

30 + (3 × 12) + 11

= 30 + (36) + 11
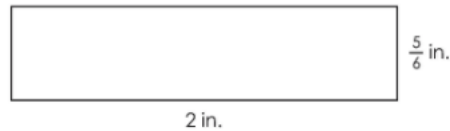
= 66 + 11

= 77

55 ≠ 77

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Question 35

Question and Scoring Guidelines

Question 35

Jace is told that the area of a rectangle is $\frac{5}{12}$ square inch. Jace draws the figure shown to represent a rectangle that could have that area.

$\frac{5}{6}$ in.

2 in.

Jace's drawing is based on an incorrect side length.

A. What is the length of a side that is incorrect? Enter the number in the first box.

B. What is the correct length of this side? Enter the number in the second box.

A. [   ] in.

B. [   ] in.

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Content Standard: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. (5.NF.4)
b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Scoring Guidelines

<u>Exemplar Response</u>

- 2 in.
- $\frac{1}{2}$ in.

<u>Other Correct Responses</u>

- $\frac{5}{6}$ in.
- $\frac{5}{24}$ in.
- Any equivalent values

For this item, a full-credit response includes:

- Two correct values (1 point).

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Question 35

Sample Responses

Sample Response: 1 point

Jace is told that the area of a rectangle is $\frac{5}{12}$ square inch. Jace draws the figure shown to represent a rectangle that could have that area.

$\frac{5}{6}$ in.

2 in.

Jace's drawing is based on an incorrect side length.

A. What is the length of a side that is incorrect? Enter the number in the first box.

B. What is the correct length of this side? Enter the number in the second box.

A. 2   *in.*

B. $\frac{1}{2}$ *in.*

1	2	3
4	5	6
7	8	9
0	.	▢/▢

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct side length for a rectangle with an area of $\frac{5}{12}$ square inch.

- The student determines that if 2 inches is the incorrect length, then the equation $\frac{5}{6} \times \square = \frac{5}{12}$ can be used to identify the correct length of the side of the rectangle.

$\frac{5}{6} \times \square = \frac{5}{12}$ square inch   AND $\square = ?$

$5 \times 1 = 5$ AND $6 \times 2 = 12$ THEREFORE $\square = \frac{1}{2}$
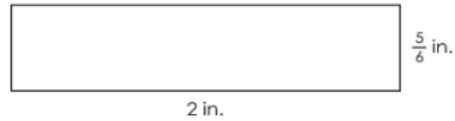
$\frac{5}{6} \times \frac{1}{2} = \frac{5 \times 1}{6 \times 2} = \frac{5}{12}$

$\frac{5}{6} \times \frac{1}{2} = \frac{5}{12}$ square inch

Sample Response: 1 point

Jace is told that the area of a rectangle is $\frac{5}{12}$ square inch. Jace draws the figure shown to represent a rectangle that could have that area.

$\frac{5}{6}$ in.

2 in.

Jace's drawing is based on an incorrect side length.

A. What is the length of a side that is incorrect? Enter the number in the first box.

B. What is the correct length of this side? Enter the number in the second box.

A. $\dfrac{5}{6}$ in.

B. $\dfrac{5}{24}$ in.

1	2	3
4	5	6
7	8	9
0	.	□/□

Notes on Scoring

This response earns full credit (1 point) because it identifies a correct side length for a rectangle with an area of $\frac{5}{12}$ square inch.

- The student determines that if $\frac{5}{6}$ inch is the incorrect length, then the equation $2 \times \square = \frac{5}{12}$ can be used to identify the correct length of the side of the rectangle.

$2 \times \square = \frac{5}{12}$ square inch

$\square = \frac{5}{12} \div 2$

$\frac{5}{12} \times \frac{1}{1} = \frac{5}{12}$ AND $\frac{2}{1} \times \frac{12}{12} = \frac{24}{12}$

$\frac{5}{12} \div \frac{24}{12} = \frac{5 \div 24}{12 \div 12} = \frac{\frac{5}{24}}{1} = \frac{5}{24}$

$\square = \frac{5}{24}$

$2 \times \frac{5}{24} = \frac{5}{12}$ square inch

While division with unit fractions is introduced in the standards in grade 5, students are not expected to be able to divide fractions with numerators greater than one by whole numbers until grade 6. A student can earn credit in grade 5 by identifying an equivalent value to a correct response.

Sample Response: 0 points

Jace is told that the area of a rectangle is $\frac{5}{12}$ square inch. Jace draws the figure shown to represent a rectangle that could have that area.

$\frac{5}{6}$ in.

2 in.

Jace's drawing is based on an incorrect side length.

A. What is the length of a side that is incorrect? Enter the number in the first box.

B. What is the correct length of this side? Enter the number in the second box.

A. $\boxed{2}$ in.

B. $\boxed{\dfrac{5}{24}}$ in.

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect side length for a rectangle with an area of $\frac{5}{12}$ square inch.

- The student may choose 2 as the incorrect side length but not use the equation $\frac{5}{6} \times \square = \frac{5}{12}$ to find the correct length of this side.

  $\frac{5}{6} \times \frac{5}{24} \neq \frac{5}{12}$

Sample Response: 0 points

Jace is told that the area of a rectangle is $\frac{5}{12}$ square inch. Jace draws the figure shown to represent a rectangle that could have that area.

$$\frac{5}{6} \text{ in.}$$

2 in.

Jace's drawing is based on an incorrect side length.

A. What is the length of a side that is incorrect? Enter the number in the first box.

B. What is the correct length of this side? Enter the number in the second box.

A. $\frac{5}{6}$ *in.*

B. $\frac{1}{2}$ *in.*

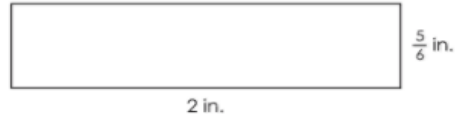| 1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns no credit (0 points) because it identifies an incorrect side length for a rectangle with an area of $\frac{5}{12}$ square inch.

- The student may choose $\frac{5}{6}$ as the incorrect side length but not use the equation $2 \times \square = \frac{5}{12}$ to find the correct length of this side.

  $2 \times \frac{1}{2} \neq \frac{5}{12}$

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Question 36

Question and Scoring Guidelines

Question 36

Which approach is the **best** to find the volume of a cube?

(A) Measure the length of one side and multiply the length by 3.

(B) Measure the length of one side and multiply the length by itself.

(C) Count the number of 1-cubic-centimeter unit cubes that fit inside the cube.

(D) Count the number of 1-square-centimeter unit squares that cover the cube.

Points Possible: 1

Content Cluster: Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Content Standard: Recognize volume as an attribute of solid figures and understand concepts of volume measurement. *(5.MD.3)*
a. A cube with side length 1 unit, called a "unit cube", is said to have "one cubic unit" of volume, and can be used to measure volume.

Scoring Guidelines

<u>Rationale for Option A:</u> This is incorrect. The student may remember that to calculate the volume of a cube, you multiply the side length of the cube by itself 2 times, but incorrectly think that this is equivalent to multiplying the side length of the cube by 3.

<u>Rationale for Option B:</u> This is incorrect. The student may confuse how to calculate the volume of a cube with how to calculate the area of a square.

<u>Rationale for Option C:</u> **Key** – The student may recall that counting the number of 1 cubic centimeter unit cubes that fit inside the cube gives the cube's volume.

<u>Rationale for Option D:</u> This is incorrect. The student may confuse how to calculate the volume of a cube with how to calculate the area of a square.

Sample Response: 1 point

Which approach is the **best** to find the volume of a cube?

Ⓐ   Measure the length of one side and multiply the length by 3.

Ⓑ   Measure the length of one side and multiply the length by itself.

●   Count the number of 1-cubic-centimeter unit cubes that fit inside the cube.

Ⓓ   Count the number of 1-square-centimeter unit squares that cover the cube.

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Question 39

Question and Scoring Guidelines

Question 39

In a gym class, $\frac{1}{8}$ of the students play basketball and $\frac{5}{12}$ play volleyball. The remaining students play soccer.

What fraction of the students in the class play soccer? Enter the number in the box.

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Points Possible: 1

Content Cluster: Use equivalent fractions as a strategy to add and subtract fractions.

Content Standard: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2. (5.NF.2)*

Scoring Guidelines

<u>Exemplar Response</u>

- $\frac{11}{24}$

<u>Other Correct Responses</u>

- Any equivalent value

For this item, a full-credit response includes:

- A correct number (1 point).

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Question 39

Sample Responses

Sample Response: 1 point

In a gym class, $\frac{1}{8}$ of the students play basketball and $\frac{5}{12}$ play volleyball. The remaining students play soccer.

What fraction of the students in the class play soccer? Enter the number in the box.

$$\frac{11}{24}$$

1	2	3
4	5	6
7	8	9
0	.	☐/☐

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the fraction of students in the class who play soccer.

- The student may subtract $\frac{1}{8}$ and $\frac{5}{12}$ from 1 using a common denominator of 24 to find the remaining number of students that play soccer in a gym class.

$$1 - \frac{1}{8} - \frac{5}{12}$$

$$1 = \frac{24}{24} \qquad \text{AND} \qquad \frac{1}{8} \times \frac{3}{3} = \frac{3}{24} \qquad \text{AND} \qquad \frac{5}{12} \times \frac{2}{2} = \frac{10}{24}$$

$$\frac{24}{24} - \frac{3}{24} - \frac{10}{24}$$

$$= \left(\frac{24}{24} - \frac{3}{24}\right) - \frac{10}{24}$$

$$= \left(\frac{21}{24}\right) - \frac{10}{24}$$

$$= \frac{11}{24}$$

Sample Response: 1 point

In a gym class, $\frac{1}{8}$ of the students play basketball and $\frac{5}{12}$ play volleyball. The remaining students play soccer.

What fraction of the students in the class play soccer? Enter the number in the box.

$$\frac{22}{48}$$

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns full credit (1 point) because it correctly identifies the fraction of students in the class who play soccer.

- The student may subtract $\frac{1}{8}$ and $\frac{5}{12}$ from 1 using a common denominator other than 24 and find the remaining number of students that play soccer in a gym class.

$$1 - \frac{1}{8} - \frac{5}{12}$$

$$1 = \frac{48}{48} \qquad \text{AND} \qquad \frac{1}{8} \times \frac{6}{6} = \frac{6}{48} \qquad \text{AND} \qquad \frac{5}{12} \times \frac{4}{4} = \frac{20}{48}$$

$$\frac{48}{48} - \frac{6}{48} - \frac{20}{48}$$

$$= \frac{48}{48} - \left(\frac{6}{48} + \frac{20}{48}\right)$$

$$= \frac{48}{48} - \left(\frac{26}{48}\right)$$

$$= \frac{22}{48}$$

Sample Response: 0 points

In a gym class, $\frac{1}{8}$ of the students play basketball and $\frac{5}{12}$ play volleyball. The remaining students play soccer.

What fraction of the students in the class play soccer? Enter the number in the box.

$$\frac{13}{24}$$

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the fraction of students in the class who play soccer.

- The student may only add the $\frac{1}{8}$ of students that play basketball to the $\frac{5}{12}$ of students that play volleyball and forget to subtract that sum to find the number of kids who play soccer.

$$\frac{1}{8} + \frac{5}{12}$$

$$\frac{1}{8} \times \frac{3}{3} = \frac{3}{24} \qquad \text{AND} \qquad \frac{5}{12} \times \frac{2}{2} = \frac{10}{24}$$

$$\frac{3}{24} + \frac{10}{24} = \frac{13}{24}$$

Sample Response: 0 points

In a gym class, $\frac{1}{8}$ of the students play basketball and $\frac{5}{12}$ play volleyball. The remaining students play soccer.

What fraction of the students in the class play soccer? Enter the number in the box.

11

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the fraction of students in the class who play soccer.

- The student may identify the number of students who play soccer without expressing the amount as a fraction of the whole class.

Least Common Denominator for 8 and 12:

8: 8 16 24 32 40

12: 12 24 36 48

$\frac{1}{8}$ of 24

$= \frac{1}{8} \times \frac{24}{1}$

$= \frac{24}{8}$

$= \frac{24}{8} \div \frac{8}{8}$

$= \frac{3}{1}$

$= 3$

AND

$\frac{5}{12}$ of 24

$= \frac{5}{12} \times \frac{24}{1}$

$= \frac{120}{12}$

$= \frac{120}{12} \div \frac{12}{12}$

$= \frac{10}{1}$

$= 10$

$24 - 3 - 10$
$= (24 - 3) - 10$
$= (21) - 10$
$= 11$ students

$$1 - \frac{1}{8} - \frac{5}{12} \neq 11$$

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Question 41

Question and Scoring Guidelines

Question 41

Select the **two** expressions that each have a value less than 2,744.

- ☐ $2{,}744 \times \frac{1}{2}$

- ☐ $2{,}744 \times \frac{3}{2}$

- ☐ $2{,}744 \times \frac{1}{1}$

- ☐ $2{,}744 \times \frac{1}{4}$

- ☐ $2{,}744 \times \frac{5}{4}$

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Content Standard: Interpret multiplication as scaling (resizing), by: *(5.NF.5)*
a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

Scoring Guidelines

<u>Rationale for First Option:</u> **Key** – The student correctly notes that multiplying by a number less than 1 results in a decrease in value.

<u>Rationale for Second Option:</u> This is incorrect. The student may incorrectly think that multiplying a number by a fraction always results in a smaller number.

<u>Rationale for Third Option:</u> This is incorrect. The student may think that the product is less than 2,744 since the second factor is written as a fraction.

<u>Rationale for Fourth Option:</u> **Key** – The student correctly notes that multiplying by a number less than 1 results in a decrease in value.

<u>Rationale for Fifth Option:</u> This is incorrect. The student may incorrectly think that multiplying a number by a fraction always results in a smaller number.

Sample Response: 1 point

Select the **two** expressions that each have a value less than 2,744.

- ☑ $2{,}744 \times \frac{1}{2}$

- ☐ $2{,}744 \times \frac{3}{2}$

- ☐ $2{,}744 \times \frac{1}{1}$

- ☑ $2{,}744 \times \frac{1}{4}$

- ☐ $2{,}744 \times \frac{5}{4}$

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Spring 2018 Item Release

Question 44

Question and Scoring Guidelines

Question 44

Which number rounds to 2.7?

Ⓐ 2.78

Ⓑ 2.71

Ⓒ 2.64

Ⓓ 2.61

Points Possible: 1

Content Cluster: Understand the place value system.

Content Standard: Use place value understanding to round decimals to any place. *(5.NBT.4)*

Scoring Guidelines

Rationale for Option A: This is incorrect. The student may incorrectly round down.

Rationale for Option B: **Key** – The student correctly identifies the number that rounds to the given number.

Rationale for Option C: This is incorrect. The student may incorrectly round up.

Rationale for Option D: This is incorrect. The student may incorrectly round up.

Sample Response: 1 point

Which number rounds to 2.7?

Ⓐ 2.78

● 2.71

ⓒ 2.64

Ⓓ 2.61

Grade 5
Math
Spring 2018 Item Release

Question 45

Question and Scoring Guidelines

Question 45

A potter has 2 pounds (lb) of clay. She makes square tiles that each use $\frac{1}{6}$ pound of clay.

Place square tiles in the blank box to represent the total number of tiles the potter can make.

- You may use the square tile more than once.

$\frac{1}{6}$ lb | Delete ✕

Points Possible: 1

Content Cluster: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Content Standard: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *(5.NF.7)*
c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

Scoring Guidelines

<u>Exemplar Response</u>

- 12 squares

<u>Other Correct Responses</u>

- N/A

For this item, a full-credit response includes:

- The correct number of tiles (1 point).

Grade 5
Math
Spring 2018 Item Release

Question 45

Sample Responses

Sample Response: 1 point

A potter has 2 pounds (lb) of clay. She makes square tiles that each use $\frac{1}{6}$ pound of clay.

Place square tiles in the blank box to represent the total number of tiles the potter can make.

- You may use the square tile more than once.

$\frac{1}{6}$ lb

Delete ✕

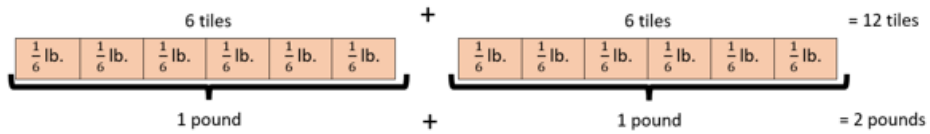| $\frac{1}{6}$ lb		$\frac{1}{6}$ lb	$\frac{1}{6}$ lb
$\frac{1}{6}$ lb	$\frac{1}{6}$ lb	$\frac{1}{6}$ lb	
$\frac{1}{6}$ lb	$\frac{1}{6}$ lb	$\frac{1}{6}$ lb	$\frac{1}{6}$ lb
	$\frac{1}{6}$ lb		$\frac{1}{6}$ lb

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct number of $\frac{1}{6}$ pound square tiles that can be made from 2 pounds of clay.

- The student may use division to identify the number of $\frac{1}{6}$ pound square tiles that can be made from 2 pounds of clay.

$2 \div \frac{1}{6} = \square$

$\frac{2}{1} \times \frac{6}{6} = \frac{12}{6}$ AND $\frac{1}{6} \times \frac{1}{1} = \frac{1}{6}$

$\frac{12}{6} \div \frac{1}{6}$

$= \frac{12 \div 1}{6 \div 6}$

$= \frac{12}{1}$

$= 12$ tiles

$2 \div \frac{1}{6} = 12$

Sample Response: 1 point

A potter has 2 pounds (lb) of clay. She makes square tiles that each use $\frac{1}{6}$ pound of clay.

Place square tiles in the blank box to represent the total number of tiles the potter can make.

- You may use the square tile more than once.

Notes on Scoring

This response earns full credit (1 point) because it identifies the correct number of $\frac{1}{6}$ pound square tiles that can be made from 2 pounds of clay.

- The student models the number of $\frac{1}{6}$ pound square tiles in 2 whole pounds of clay.

Sample Response: 0 points

A potter has 2 pounds (lb) of clay. She makes square tiles that each use $\frac{1}{6}$ pound of clay.

Place square tiles in the blank box to represent the total number of tiles the potter can make.

- You may use the square tile more than once.

Notes on Scoring

This response earns no credit (0 points) because it identifies the incorrect number of $\frac{1}{6}$ pound square tiles that can be made from 2 pounds of clay.

- The student places the equivalent of 1 pound of $\frac{1}{6}$ pound squares instead of 2 pounds of $\frac{1}{6}$ pound squares.

  $6 \times \frac{1}{6} \neq 2$

Sample Response: 0 points

A potter has 2 pounds (lb) of clay. She makes square tiles that each use $\frac{1}{6}$ pound of clay.

Place square tiles in the blank box to represent the total number of tiles the potter can make.

- You may use the square tile more than once.

Notes on Scoring

This response earns no credit (0 points) because it incorrectly identifies the number of $\frac{1}{6}$ pound square tiles that can be made from 2 pounds of clay.

- The student may place two $\frac{1}{6}$ pound squares thinking that it accounts for 2 pounds.

$\frac{1}{6} + \frac{1}{6} \neq 2$