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<td>Question 48</td>
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<tbody>
<tr>
<td>1</td>
<td>Equation Item</td>
<td>Summarize and describe distributions.</td>
<td>Summarize numerical data sets in relation to their context. <em>(6.SP.5)</em>&lt;br&gt;a. Reporting the number of observations.</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>4</td>
<td>Multiple Choice Item</td>
<td>Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>Understand the concept of a unit rate a/b associated with a ratio a:b with b not equal to 0, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar.” “We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.” <em>(6.RP.2)</em></td>
<td>Level 1</td>
<td>C</td>
<td>1 point</td>
</tr>
<tr>
<td>8</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of numbers to the system of rational numbers.</td>
<td>Understand ordering and absolute value of rational numbers. <em>(6.NS.7)</em>&lt;br&gt;c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write</td>
<td>-30</td>
<td>= 30 to describe the size of the debt in dollars.</td>
<td>Level 3</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>11</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</td>
<td>Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for ((2/3) \div (3/4)) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that ((2/3) \div (3/4) = 8/9) because (3/4) of (8/9) is (2/3). (In general, ((a/b) \div (c/d) = (ad)/(bc)).) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length (3/4) mi and area (1/2) square mi? (6.NS.1)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
</tbody>
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<tr>
<td>14</td>
<td>Equation Item</td>
<td>Represent and analyze quantitative relationships between dependent and independent variables.</td>
<td>Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation ( d = 65t ) to represent the relationship between distance and time. (6.EE.9)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>17</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of arithmetic to algebraic expressions.</td>
<td>Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression ( 3(2 + x) ) to produce the equivalent expression ( 6 + 3x ); apply the distributive property to the expression ( 24x + 18y ) to produce the equivalent expression ( 6(4x + 3y) ); apply properties of operations to ( y + y + y ) to produce the equivalent expression ( 3y ). (6.EE.3)</td>
<td>Level 3</td>
<td>---</td>
<td>1 point</td>
</tr>
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<tbody>
<tr>
<td>20</td>
<td>Equation Item</td>
<td>Compute fluently with multi-digit numbers and find common factors and multiples.</td>
<td>Fluently divide multi-digit numbers using a standard algorithm. (6.NS.2)</td>
<td>Level 1</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>21</td>
<td>Table Item</td>
<td>Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.” (6.RP.1)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>23</td>
<td>Equation Item</td>
<td>Reason about and solve one-variable equations and inequalities.</td>
<td>Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (6.EE.6)</td>
<td>Level 3</td>
<td>---</td>
<td>1 point</td>
</tr>
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<tr>
<td>25</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of arithmetic to algebraic expressions.</td>
<td>Write, read, and evaluate expressions in which letters stand for numbers. (6.EE.2) c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, using the algebraic order of operations when there are no parentheses to specify a particular order. For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</td>
<td>Level 2 ---</td>
<td>1 point</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Equation Item</td>
<td>Apply and extend previous understandings of numbers to the system of rational numbers.</td>
<td>Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (6.NS.5)</td>
<td>Level 1 ---</td>
<td>1 point</td>
<td></td>
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<tr>
<td>30</td>
<td>Equation Item</td>
<td>Solve real-world and mathematical problems involving area, surface area, and volume.</td>
<td>Through composition into rectangles or decomposition into triangles, find the area of right triangles, other triangles, special quadrilaterals, and polygons; apply these techniques in the context of solving real-world and mathematical problems. (6.G.1)</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>33</td>
<td>Equation Item</td>
<td>Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3) c. Find a percent of a quantity as a rate per 100, e.g., 30% of a quantity means 30/100 times the quantity; solve problems involving finding the whole, given a part and the percent.</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>37</td>
<td>Equation Item</td>
<td>Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3) b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?</td>
<td>Level 2</td>
<td>---</td>
<td>1 point</td>
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<tr>
<td>38</td>
<td>Multi Select Item</td>
<td>Reason about and solve one-variable equations and inequalities.</td>
<td>Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. (6.EE.5)</td>
<td>Level 2</td>
<td>D, E</td>
<td>1 point</td>
</tr>
<tr>
<td>39</td>
<td>Equation Item</td>
<td>Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3) c. Find a percent of a quantity as a rate per 100, e.g., 30% of a quantity means 30/100 times the quantity; solve problems involving finding the whole, given a part and the percent.</td>
<td>Level 3</td>
<td>---</td>
<td>1 point</td>
</tr>
<tr>
<td>40</td>
<td>Multi Interaction Item</td>
<td>Apply and extend previous understandings of numbers to the system of rational numbers.</td>
<td>Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (6.NS.8)</td>
<td>Level 2</td>
<td>---</td>
<td>2 points</td>
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<tbody>
<tr>
<td>41</td>
<td>Multiple Choice Item</td>
<td>Reason about and solve one-variable equations and inequalities.</td>
<td>Solve real-world and mathematical problems by writing and solving equations of the form (x + p = q) and (px = q) for cases in which (p, q) and (x) are all nonnegative rational numbers. (6.EE.7)</td>
<td>Level 2</td>
<td>B</td>
<td>1 point</td>
</tr>
</tbody>
</table>
| 45            | Multiple Choice Item | Apply and extend previous understandings of numbers to the system of rational numbers. | Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. (6.NS.6)  
  b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. | Level 1            | B          | 1 point |
| 48            | Multiple Choice Item | Develop understanding of statistical problem solving.                          | Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (6.SP.2) | Level 2            | C          | 1 point |

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Depth of Knowledge (DOK)

DOK refers to the complexity of thinking required to complete a task in a given item. Items with a DOK 1 designation focus on the recall of information, such as definitions and terms, and simple procedures. Items with a DOK 2 designation require students to make decisions, solve routine problems, perform calculations, or recognize patterns. Items with a DOK 3 designation feature higher-order cognitive tasks. These DOK 3 tasks include but are not limited to: critiquing a statement and forming a conclusion; explaining, justifying, or proving a statement; or approaching abstract, complex, open-ended, and non-routine problems. Each grade’s blueprint contains information about the number of points of opportunity students will encounter at each DOK level.

Table 1: Math Descriptors – Applying Depth of Knowledge Levels for Mathematics (Webb, 2002) & NAEP 2002 Mathematics Levels of Complexity
(M. Petit, Center for Assessment 2003, K. Hess, Center for Assessment, updated 2006)

<table>
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<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall</td>
<td>Skills/Concepts</td>
<td>Strategic Thinking</td>
<td>Extended Thinking</td>
</tr>
<tr>
<td>a. Recall, observe, or recognize a fact, definition, term, or property</td>
<td>a. Classify plane and three-dimensional figures</td>
<td>a. Interpret information from a complex graph</td>
<td>a. Relate mathematical concepts to other content areas</td>
</tr>
<tr>
<td>b. Apply/compute a well-known algorithm (e.g., sum, quotient)</td>
<td>b. Interpret information from a simple graph</td>
<td>b. Explain thinking when more than one response is possible</td>
<td>b. Relate mathematical concepts to real-world applications in new situations</td>
</tr>
<tr>
<td>c. Apply a formula</td>
<td>c. Use models to represent mathematical concepts</td>
<td>c. Make and/or justify conjectures</td>
<td>c. Apply a mathematical model to illuminate a problem, situation</td>
</tr>
<tr>
<td>d. Determine the area or perimeter of rectangles or triangles given a drawing and labels</td>
<td>d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts</td>
<td>d. Use evidence to develop logical arguments for a concept</td>
<td>d. Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results</td>
</tr>
<tr>
<td>e. Identify a plane or three-dimensional figure</td>
<td>e. Compare and/or contrast figures or statements</td>
<td>e. Use concepts to solve non-routine problems</td>
<td>e. Design a mathematical model to inform and solve a practical or abstract situation</td>
</tr>
<tr>
<td>f. Measure</td>
<td>f. Construct 2-dimensional patterns for 3-dimensional models, such as cylinders and cones</td>
<td>f. Perform procedure with multiple steps and multiple decision points</td>
<td>f. Develop generalizations of the results obtained and the strategies used and apply them to new problem situations</td>
</tr>
<tr>
<td>g. Perform a specified or routine procedure (e.g., apply rules for rounding)</td>
<td>g. Provide justifications for steps in a solution process</td>
<td>g. Generalize a pattern</td>
<td></td>
</tr>
<tr>
<td>h. Evaluate an expression</td>
<td>h. Extend a pattern</td>
<td>h. Describe, compare, and contrast solution methods</td>
<td></td>
</tr>
<tr>
<td>i. Solve a one-step word problem</td>
<td>i. Formulate a mathematical model for a complex situation</td>
<td>i.</td>
<td></td>
</tr>
<tr>
<td>j. Retrieve information from a table or graph</td>
<td>j. Provide mathematical justifications</td>
<td>j.</td>
<td></td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>Recall</td>
<td>Skills/Concepts</td>
<td>Strategic Thinking</td>
<td>Extended Thinking</td>
</tr>
<tr>
<td>k. Recall, identify, or make conversions between and among representations or numbers (fractions, decimals, and percents), or within and between customary and metric measures</td>
<td>i. Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps</td>
<td>k. Solve a multiple-step problem and provide support with a mathematical explanation that justifies the answer</td>
<td>g. Apply one approach among many to solve problems</td>
</tr>
<tr>
<td>l. Locate numbers on a number line, or points on a coordinate grid</td>
<td>j. Translate between tables, graphs, words and symbolic notation</td>
<td>l. Solve 2-step linear equations/inequalities in one variable over the rational numbers, interpret solution(s) in the original context, and verify reasonableness of results</td>
<td>h. Apply understanding in a novel way, providing an argument/justification for the application</td>
</tr>
<tr>
<td>m. Solve linear equations</td>
<td>k. Make direct translations between problem situations and symbolic notation</td>
<td>m. Translate between a problem situation and symbolic notation that is not a direct translation</td>
<td></td>
</tr>
<tr>
<td>n. Represent math relationships in words, pictures, or symbols</td>
<td>l. Select a procedure according to criteria and perform it</td>
<td>n. Formulate an original problem, given a situation</td>
<td></td>
</tr>
<tr>
<td>o. Read, write, and compare decimals in scientific notation</td>
<td>m. Specify and explain relationships between facts, terms, properties, or operations</td>
<td>o. Analyze the similarities and differences between procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n. Compare, classify, organize, estimate, or order data</td>
<td>p. Draw conclusion from observations or data, citing evidence</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Level 4 involves such things as complex restructuring of data or establishing and evaluating criteria to solve problems.
Grade 6 Math
Spring 2019 Item Release

Question 1

Question and Scoring Guidelines
Question 1

Zoe surveys her classmates on the number of days they went to a park the previous week. She records all of her results on the dot plot shown.

How many classmates did Zoe survey?

Points Possible: 1

Content Cluster: Summarize and describe distributions.

Content Standard: Summarize numerical data sets in relation to their context. (6.SP.5)
   a. Reporting the number of observations.

Depth of Knowledge: Level 2
   b. Interpret information from a simple graph

Calculator Designation: Calculator Neutral
Scoring Guidelines

Exemplar Response

- 22

Other Correct Responses

- any equivalent value

For the item, a full-credit response includes

- the correct value (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 1

Sample Responses
Zoe surveys her classmates on the number of days they went to a park the previous week. She records all of her results on the dot plot shown.

How many classmates did Zoe survey?

22

Notes on Scoring

This response earns full credit (1 point). The student correctly identifies that each data point in the plot represents two classmates and calculates the number of classmates Zoe surveys.
Sample Response: 0 points

Zoe surveys her classmates on the number of days they went to a park the previous week. She records all of her results on the dot plot shown.

How many classmates did Zoe survey?

11

Notes on Scoring

This response earns no credit (0 points). The student may count the number of dots on the graph and not take the key into consideration.
Sample Response: 0 points

Zoe surveys her classmates on the number of days they went to a park the previous week. She records all of her results on the dot plot shown.

How many classmates did Zoe survey?

20

Notes on Scoring

This response earns no credit (0 points). The student may count that there are only 10 data points instead of 11 on the plot and then multiply that number by 2 to get 20 as the number of classmates.
Question 4

Which statement describes a unit rate?

(A) Alex eats 3 apples.
(B) Kyle runs 3 miles over 2 days.
(C) Zack reads 3 pages of his book per minute.
(D) Michael adds 3 cups of sugar for every 2 cups of flour.

Points Possible: 1

**Content Cluster:** Understand ratio concepts and use ratio reasoning to solve problems.

**Content Standard:** Understand the concept of a unit rate \( \frac{a}{b} \) associated with a ratio \( a:b \) with \( b \) not equal to 0, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is \( \frac{3}{4} \) cup of flour for each cup of sugar.” “We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger.” (6.RP.2)

**Depth of Knowledge:** Level 1
a. Recall, observe, or recognize a fact, definition, term, or property
n. Represent math relationships in words, pictures, or symbols

**Calculator Designation:** Calculator Neutral
Scoring Guidelines

Rationale for Option A: This is incorrect. The student may note that a unit rate can have just one number but forget that a unit rate still needs the other unit label.

Rationale for Option B: This is incorrect. The student may correctly identify a rate but forget that a unit rate compares a quantity to one unit of another quantity.

Rationale for Option C: Key – The student notes that one quantity, 3 pages, is being compared to one unit of another quantity, per minute, thus making it a unit rate.

Rationale for Option D: This is incorrect. The student may correctly identify a rate using the words “for every” but forget that a unit rate compares a quantity to one unit of another quantity.

Sample Response: 1 point

Which statement describes a unit rate?

(A) Alex eats 3 apples.
(B) Kyle runs 3 miles over 2 days.
(C) Zack reads 3 pages of his book per minute.
(D) Michael adds 3 cups of sugar for every 2 cups of flour.
Grade 6 Math
Spring 2019 Item Release

Question 8

Question and Scoring Guidelines
Question 8

The three inequalities shown relate rational numbers $a$, $b$, and $c$.

- $a < b$
- $b < c$
- $|b| > 1 \cdot c$

What are possible values of $a$, $b$, and $c$?

$$a = \quad \quad \quad \quad \quad$$

$$b = \quad \quad \quad \quad \quad$$

$$c = \quad \quad \quad \quad \quad$$

[Keyboard input options]

[1, 2, 3, 4, 5, 6, 7, 8, 9, 0, ., -, $\frac{0}{5}$]
Scoring Guidelines

Exemplar Response

• $a = -7$
  $b = -5$
  $c = -1$

Other Correct Responses

• any values where $a < b$, $b < c$, and $|b| > |c|$

For the item, a full-credit response includes

• three correct values (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 8

Sample Responses
Sample Response: 1 point

The three inequalities shown relate rational numbers \( a, b, \) and \( c \).

- \( a < b \)
- \( b < c \)
- \( |b| > |c| \)

What are possible values of \( a, b, \) and \( c \)?

\[
\begin{align*}
  a &= \boxed{-3} \\
  b &= \boxed{-2} \\
  c &= \boxed{-1}
\end{align*}
\]

Notes on Scoring

This response earns full credit (1 point). The student identifies three numbers that satisfy the inequalities, \(-3 < -2, \ -2 < -1, \) and \(|-2| > |-1|\).
Sample Response: 1 point

The three inequalities shown relate rational numbers $a$, $b$, and $c$.

- $a < b$
- $b < c$
- $|b| > |c|$

What are possible values of $a$, $b$, and $c$?

$a = \boxed{-5}$

$b = \boxed{-4}$

$c = \boxed{3}$

Notes on Scoring

This response earns full credit (1 point). The student identifies three numbers that satisfy the inequalities, $-5 < -4$, $-4 < 3$, and $|-4| > |3|$.
Sample Response: 0 points

The three inequalities shown relate rational numbers \(a\), \(b\), and \(c\).

- \(a < b\)
- \(b < c\)
- \(|b| > |c|\)

What are possible values of \(a\), \(b\), and \(c\)?

\[
\begin{align*}
  a &= 1 \\
  b &= 3 \\
  c &= 2
\end{align*}
\]

Notes on Scoring

This response earns no credit (0 points). The student writes 3 numbers that satisfy the first and the last inequalities, but not the second inequality; \(1 < 3\), \(3\) is not less than \(2\), and \(|3| > |2|\).
Sample Response: 0 points

The three inequalities shown relate rational numbers $a$, $b$, and $c$.

- $a < b$
- $b < c$
- $|b| > |c|$

What are possible values of $a$, $b$, and $c$?

$a = 1$

$b = 2$

$c = 3$

Notes on Scoring

This response earns no credit (0 points). The student writes 3 numbers that satisfy the first and second inequalities, but not the third; $1 < 2$, $2 < 3$, but $|2|$ is not greater than $|3|$. 
Question 11

Question and Scoring Guidelines
**Question 11**

Nadya has $19 \frac{1}{4}$ yards of ribbon. She cuts the ribbon into pieces that each measure $1 \frac{3}{4}$ yards.

How many pieces of ribbon does Nadya have?

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Points Possible: 1

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

Content Standard: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for \(\frac{2}{3} \div \frac{3}{4}\) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that \(\frac{2}{3} \div \frac{3}{4} = \frac{8}{9}\) because \(\frac{3}{4}\) of \(\frac{8}{9}\) is \(\frac{2}{3}\). (In general, \((a/b) \div (c/d) = (ad)/(bc)\).) How much chocolate will each person get if 3 people share \(\frac{1}{2}\) lb of chocolate equally? How many \(\frac{3}{4}\)-cup servings are in \(\frac{2}{3}\) of a cup of yogurt? How wide is a rectangular strip of land with length \(\frac{3}{4}\) mi and area \(\frac{1}{2}\) square mi? (6.NS.1)

Depth of Knowledge: Level 2

d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Calculator Designation: No Calculator

Scoring Guidelines

Exemplar Response

- 11

Other Correct Responses

- N/A

For the item, a full-credit response includes

- the correct value (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 11

Sample Responses
Sample Response: 1 point

Nadya has \(19 \frac{1}{4}\) yards of ribbon. She cuts the ribbon into pieces that each measure \(1 \frac{3}{4}\) yards.

How many pieces of ribbon does Nadya have?

11

Notes on Scoring

This response earns full credit (1 point). The student may convert the mixed numbers into fractions getting \(\frac{77}{4} \div \frac{7}{4}\), divide the numerators and divide the denominators and get \(\frac{11}{1} = 11\) pieces of ribbon.
Sample Response: 0 points

Nadya has $19 \frac{1}{4}$ yards of ribbon. She cuts the ribbon into pieces that each measure $1 \frac{3}{4}$ yards.

How many pieces of ribbon does Nadya have?

10

Notes on Scoring

This response earns no credit (0 points). The student may correctly convert the mixed numbers to decimals but may make an error when dividing 19.25 by 1.75. The student may round both numbers to get $20 \div 2 = 10$. 
Sample Response: 0 points

Nadya has $19 \frac{1}{4}$ yards of ribbon. She cuts the ribbon into pieces that each measure $1 \frac{3}{4}$ yards.

How many pieces of ribbon does Nadya have?

21

Notes on Scoring

This response earns no credit (0 points). The student may add the two given numbers together instead of dividing.
Sample Response: 0 points

Nadya has $19 \frac{1}{4}$ yards of ribbon. She cuts the ribbon into pieces that each measure $1 \frac{3}{4}$ yards.

How many pieces of ribbon does Nadya have?

1824

Notes on Scoring

This response earns no credit (0 points). The student may try to subtract the two numbers, first by subtracting 1 from 19 to get 18, and then by subtracting $\frac{1}{4}$ from $\frac{3}{4}$ to get $\frac{2}{4}$, thinking you cannot subtract 3 from 1. Finally, the student may not know how to write a mixed number in the response box, ending up with 18 and $\frac{2}{4}$ and writing 1824.
Grade 6 Math
Spring 2019 Item Release
Question 14
Question and Scoring Guidelines
Question 14

The average speed of an airplane is 550 miles per hour.

Create an equation to represent the distance, \( d \), in miles, that the airplane travels after \( t \) hours at the average speed.

\[
d = \text{(equation here)}
\]
Points Possible: 1

Content Cluster: Represent and analyze quantitative relationships between dependent and independent variables.

Content Standard: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation \( d = 65t \) to represent the relationship between distance and time. (6.EE.9)

Depth of Knowledge: Level 2
j. Translate between tables, graphs, words and symbolic notation
k. Make direct translations between problem situations and symbolic notation

Calculator Designation: Calculator Neutral

Scoring Guidelines

Exemplar Response

- \( d = 550t \)

Other Correct Responses

- any equivalent equation

For the item, a full-credit response includes

- a correct equation (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 14

Sample Responses
Sample Response: 1 point

The average speed of an airplane is 550 miles per hour.

Create an equation to represent the distance, \( d \), in miles, that the airplane travels after \( t \) hours at the average speed.

\[ 550 \cdot t = d \]

Notes on Scoring

This response earns full credit (1 point). The student creates a correct equation using the two variables and the speed of the airplane. 550 miles per hour multiplied by the time traveled equals the total distance.
Sample Response: 1 point

The average speed of an airplane is 550 miles per hour.

Create an equation to represent the distance, \(d\), in miles, that the airplane travels after \(t\) hours at the average speed.

\[
d \div t = 550
\]

Notes on Scoring

This response earns full credit (1 point). The student creates a correct equation using the two variables and the speed of the airplane. The number of miles (\(d\)) per hour (\(t\), \(d \div t\), equals 550 miles in one hour.
Sample Response: 0 points

The average speed of an airplane is 550 miles per hour.
Create an equation to represent the distance, $d$, in miles, that the airplane travels after $t$ hours at the average speed.

\[ d \div t \]

Notes on Scoring

This response earns no credit (0 points). The student creates an expression and not an equation using all the given information.
Sample Response: 0 points

The average speed of an airplane is 550 miles per hour.

Create an equation to represent the distance, \( d \), in miles, that the airplane travels after \( t \) hours at the average speed.

\[ d + t = 550 \]

Notes on Scoring

This response earns no credit (0 points). The student does not use the two variables in a correct way; the student may incorrectly think that the distance, \( d \), and the time, \( t \), should be added.
Grade 6 Math
Spring 2019 Item Release

Question 17

Question and Scoring Guidelines
Question 17

The expression $c(16x + 14)$ is equivalent to $32x + d$.

What are the values of $c$ and $d$?

$c =$

$d =$

1 2 3 4 5 6 7 8 9 0 


Scoring Guidelines

Exemplar Response

- \( c = 2 \)
- \( d = 28 \)

Other Correct Responses

- any equivalent values

For the item, a full-credit response includes

- any equivalent values
- two correct values (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 17

Sample Responses
Sample Response: 1 point

The expression $c(16x + 14)$ is equivalent to $32x + d$.

What are the values of $c$ and $d$?

$c = 2$

$d = 28$

Notes on Scoring

This response earns full credit (1 point). The student distributes $c$ to $16x$ and correctly realizes that $16x$ multiplied by $c$ needs to be $32x$, therefore $c$ must be 2. The variable $c$, 2, distributed to 14 would be $2 \cdot 14 = 28$, which means $d$ will be 28.
Sample Response: 1 point

The expression $c(16x + 14)$ is equivalent to $32x + d$.

What are the values of $c$ and $d$?

$c = \frac{32}{16}$

$d = 28.0$

Notes on Scoring

This response earns full credit (1 point). The student may find the multiplicand they need to multiply by 16 to get 32 by solving $32 \div 16$. Once the value of $c$ is established the student correctly distributes it to 14 to find that $d$ is 28.
Sample Response: 0 points

The expression \( c(16x + 14) \) is equivalent to \( 32x + d \).

What are the values of \( c \) and \( d \)?

\[
\begin{align*}
\quad & c = 2 \\
\quad & d = 14
\end{align*}
\]

Notes on Scoring

This response earns no credit (0 points). The student calculates the correct value for \( c \) but forgets to distribute 2 to 14, resulting in an incorrect \( d \) value of 14.
Sample Response: 0 points

The expression $c(16x + 14)$ is equivalent to $32x + d$.

What are the values of $c$ and $d$?

\[
\begin{align*}
    c &= 30 \\
    d &= 32
\end{align*}
\]

Notes on Scoring

This response earns no credit (0 points). The student may try to use the numbers in each expression to obtain $c$ and $d$. i.e., the student may add the coefficient 16 and the constant 14 to get 30 in the first expression, and they get 32 from the coefficient in the second expression.
Grade 6 Math
Spring 2019 Item Release

Question 20

Question and Scoring Guidelines
**Question 20**

An expression is given.

26,091 ÷ 13

What is the value of the expression?

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**Points Possible:** 1

**Content Cluster:** Compute fluently with multi-digit numbers and find common factors and multiples.

**Content Standard:** Fluently divide multi-digit numbers using a standard algorithm. *(6.NS.2)*

**Depth of Knowledge:** Level 1  
b. Apply/compute a well-known algorithm (e.g., sum, quotient)  
h. Evaluate an expression

**Calculator Designation:** No Calculator
Scoring Guidelines

Exemplar Response

• 2.007

Other Correct Responses

• any equivalent value except for the expression 26,091/13

For the item, a full-credit response includes

• the correct value (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 20

Sample Responses
Sample Response: 1 point

An expression is given.

\[ 26,091 \div 13 \]

What is the value of the expression?

\[ 2007 \]

Notes on Scoring

This response earns full credit (1 point). The student may use an algorithm to correctly compute the quotient.
Sample Response: 0 points

An expression is given.

26,091 ÷ 13

What is the value of the expression?

207

Notes on Scoring

This response earns no credit (0 points). The student may decompose 26,091 into 26,000 and 91. The student may correctly calculate 91 ÷ 13 to be 7 but miss a zero when calculating 26,000 ÷ 13 and get 200 instead of 2000, and then add 200 and 7 to get 207.
Sample Response: 0 points

An expression is given.

26,091 ÷ 13

What is the value of the expression?

2006

Notes on Scoring

This response earns no credit (0 points). The student may correctly calculate that 26000 divided by 13 is 2000 but incorrectly calculate that 13 goes into 91 six times instead of seven, and then adds 2000 and 6 to get 2006.
Question 21

Farrah has 150 dimes, 250 nickels, and 400 pennies.

Complete the table to show the ratio of the number of pennies to the total number of coins.

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Points Possible: 1

Content Cluster: Understand ratio concepts and use ratio reasoning to solve problems.

Content Standard: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.” (6.RP.1)

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Calculator Designation: Calculator Neutral
Scoring Guidelines

Exemplar Response

\[
\begin{array}{c|c}
400 & 800 \\
\end{array}
\]

Other Correct Responses

• any equivalent ratio

For the item, a full-credit response includes

• the correct ratio (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 21

Sample Responses
Sample Response: 1 point

Farrah has 150 dimes, 250 nickels, and 400 pennies.

Complete the table to show the ratio of the number of pennies to the total number of coins.

| 400 | : | 800 |

Notes on Scoring

This response earns full credit (1 point). The student writes a correct ratio of 400 pennies to a total of 800 coins.
Sample Response: 1 point

Farrah has 150 dimes, 250 nickels, and 400 pennies.

Complete the table to show the ratio of the number of pennies to the total number of coins.

\[
\begin{array}{c|c}
1 & 2 \\
\end{array}
\]

Notes on Scoring

This response earns full credit (1 point). The student writes a correct ratio; there are twice as many coins as there are pennies.
Sample Response: 0 points

Farrah has 150 dimes, 250 nickels, and 400 pennies.

Complete the table to show the ratio of the number of pennies to the total number of coins.

| 800 | : | 400 |

Notes on Scoring

This response earns no credit (0 points). The student reverses the correct ratio, stating that there are 800 pennies to 400 total coins.
Sample Response: 0 points

Farrah has 150 dimes, 250 nickels, and 400 pennies.

Complete the table to show the ratio of the number of pennies to the total number of coins.

\[
\begin{array}{|c|c|}
\hline
1 & 1 \\
\hline
\end{array}
\]

Notes on Scoring

This response earns no credit (0 points). The student writes the ratio of the number of pennies to the number of other coins, i.e. the ratio of pennies, 400, to the total number of nickels and dimes combined, 400.
Grade 6 Math
Spring 2019 Item Release

Question 23

Question and Scoring Guidelines
Holly, Chris and Tony each collect action figures. Chris has twice as many action figures as Holly. Holly has 3 fewer action figures than Tony.

Create an expression that represents the number of action figures Chris has in terms of the number of action figures Tony has, \( t \).

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Points Possible: 1

Content Cluster: Reason about and solve one-variable equations and inequalities.

Content Standard: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (6.EE.6)

Depth of Knowledge: Level 3
e. Use concepts to solve non-routine problems
f. Perform procedures with multiple steps and multiple decision points
i. Formulate a mathematical model for a complex situation
m. Translate between a problem situation and symbolic notation that is not a direct translation

Calculator Designation: Calculator Neutral

Scoring Guidelines
Exemplar Response

• $2(t - 3)$

Other Correct Responses

• any equivalent expression

For the item, a full-credit response includes

• a correct expression (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 23

Sample Responses
Sample Response: 1 point

Holly, Chris and Tony each collect action figures. Chris has twice as many action figures as Holly. Holly has 3 fewer action figures than Tony.

Create an expression that represents the number of action figures Chris has in terms of the number of action figures Tony has, \( t \).

\[ 2(t-3) \]

Notes on Scoring

This response earns full credit (1 point). The student writes a correct expression to model the situation. Tony has \( t \) figures, Holly has \((t - 3)\) figures, and therefore, Chris has \( 2(t - 3) \) figures.
Sample Response: 1 point

Holly, Chris and Tony each collect action figures. Chris has twice as many action figures as Holly. Holly has 3 fewer action figures than Tony.

Create an expression that represents the number of action figures Chris has in terms of the number of action figures Tony has, $t$.

$$2t - 6$$

Notes on Scoring

This response earns full credit (1 point). The student writes a correct expression to model the situation. Tony has $t$ figures, Holly has $(t - 3)$ figures, and Chris has $2(t - 3)$ figures. The student then distributes the 2 over the parentheses to get $2t - 6$. 
Sample Response: 0 points

Holly, Chris and Tony each collect action figures. Chris has twice as many action figures as Holly. Holly has 3 fewer action figures than Tony.

Create an expression that represents the number of action figures Chris has in terms of the number of action figures Tony has, \( t \).

\[ 6 \]

Notes on Scoring

This response earns no credit (0 points). The student may read “Chris has twice as many... as Holly. Holly has 3...” and calculate \( 2 \cdot 3 \) to get 6.
Sample Response: 0 points

Holly, Chris and Tony each collect action figures. Chris has twice as many action figures as Holly. Holly has 3 fewer action figures than Tony.

Create an expression that represents the number of action figures Chris has in terms of the number of action figures Tony has, \( t \).

\[ t - 3 \cdot 2 \]

Notes on Scoring

This response earns no credit (0 points). The student may not remember that they need parentheses to separate the quantity \( t - 3 \) from the 2, so this expression is equivalent to \( t - 6 \).
Grade 6 Math
Spring 2019 Item Release

Question 25

Question and Scoring Guidelines
Question 25

An expression is given.

5(x - 1)

What is the value of the expression when x = 5?
Points Possible: 1

Content Cluster: Apply and extend previous understandings of arithmetic to algebraic expressions.

Content Standard: Write, read, and evaluate expressions in which letters stand for numbers. (6.EE.2)
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, using the algebraic order of operations when there are no parentheses to specify a particular order. For example, use the formulas \( V = s^3 \) and \( A = 6s^2 \) to find the volume and surface area of a cube with sides of length \( s = 1/2 \).

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Calculator Designation: No Calculator

Scoring Guidelines

Exemplar Response

• 20

Other Correct Responses

• any equivalent value

For the item, a full-credit response includes

• the correct value (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 25

Sample Responses
Sample Response: 1 point

An expression is given.

\[ 5(x - 1) \]

What is the value of the expression when \( x = 5 \)?

20

Notes on Scoring

This response earns full credit (1 point). The student substitutes 5 for \( x \) and correctly evaluates the expression using distribution.
Sample Response: 0 points

An expression is given.

\[ 5(x - 1) \]

What is the value of the expression when \( x = 5 \)?

\[ 25 \]

Notes on Scoring

This response earns no credit (0 points). The student may correctly substitute 5 for \( x \) and multiply \( 5 \cdot 5 \) to get 25, but forget that there is a 1 within the parentheses as well.
Sample Response: 0 points

An expression is given.

\[ 5(x - 1) \]

What is the value of the expression when \( x = 5 \)?

24

Notes on Scoring

This response earns no credit (0 points). The student may correctly substitute 5 for \( x \) and multiply \( 5 \cdot 5 \) to get 25, and then subtract 1 from the 25 to get 24, forgetting to distribute the 5 over the 1.
Grade 6 Math
Spring 2019 Item Release

Question 28

Question and Scoring Guidelines
Question 28

On Monday, the temperature was −7 degrees Fahrenheit in Akron, Ohio.

On Tuesday, the temperature was colder than on Monday.

What is a possible temperature, in degrees Fahrenheit, for Tuesday?

degrees Fahrenheit

Points Possible: 1

Content Cluster: Apply and extend previous understandings of numbers to the system of rational numbers.

Content Standard: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (6.NS.5)

Depth of Knowledge: Level 1
a. Recall, observe, or recognize a fact, definition, term, or property
   I. Locate numbers on a number line, or points on a coordinate grid

Calculator Designation: Calculator Neutral
**Scoring Guidelines**

**Exemplar Response**

- –8

**Other Correct Responses**

- any value less than –7

For the item, a full-credit response includes

- a correct value (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 28

Sample Responses
Sample Response: 1 point

On Monday, the temperature was –7 degrees Fahrenheit in Akron, Ohio.

On Tuesday, the temperature was colder than on Monday.

What is a possible temperature, in degrees Fahrenheit, for Tuesday?

[8]

Notes on Scoring

This response earns full credit (1 point). The student correctly enters a value corresponding to a temperature one degree colder than –7 degrees Fahrenheit.
Sample Response: 1 point

On Monday, the temperature was \(-7\) degrees Fahrenheit in Akron, Ohio.
On Tuesday, the temperature was colder than on Monday.
What is a possible temperature, in degrees Fahrenheit, for Tuesday?

\(-10\) degrees Fahrenheit

Notes on Scoring
This response earns full credit (1 point). The student correctly enters a value corresponding to a temperature 3 degrees colder than \(-7\) degrees Fahrenheit.
Sample Response: 0 points

On Monday, the temperature was –7 degrees Fahrenheit in Akron, Ohio.
On Tuesday, the temperature was colder than on Monday.
What is a possible temperature, in degrees Fahrenheit, for Tuesday?

7 degrees Fahrenheit

Notes on Scoring

This response earns no credit (0 points). The student incorrectly enters a value corresponding to a temperature 14 degrees warmer than –7 degrees Fahrenheit. They may think that 7 is less than –7.
Sample Response: 0 points

On Monday, the temperature was $-7$ degrees Fahrenheit in Akron, Ohio.
On Tuesday, the temperature was colder than on Monday.
What is a possible temperature, in degrees Fahrenheit, for Tuesday?

$-4$ degrees Fahrenheit

Notes on Scoring

This response earns no credit (0 points). The student incorrectly enters a value corresponding to a temperature three degrees warmer than $-7$ degrees Fahrenheit. They may think that $-4$ is less than $-7$ because the digit 4 is less than 7, not realizing that the numbers are below/less than zero on a number or on a thermometer.
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Question 30

Question and Scoring Guidelines
Question 30

A right triangle is shown.

14 cm

6 cm

What is the area, in square centimeters (cm²), of the right triangle?

\[ cm^2 \]

[Table with options: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, ., -]
Points Possible: 1

Content Cluster: Solve real-world and mathematical problems involving area, surface area, and volume.

Content Standard: Through composition into rectangles or decomposition into triangles, find the area of right triangles, other triangles, special quadrilaterals, and polygons; apply these techniques in the context of solving real-world and mathematical problems. (6.G.1)

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
i. Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps

Calculator Designation: Calculator

Scoring Guidelines

Exemplar Response

- 42 cm²

Other Correct Responses

- any equivalent value

For the item, a full-credit response includes

- a correct value (1 point).
Grade 6 Math
Spring 2019 Item Release

Question 30

Sample Responses
Sample Response: 1 point

A right triangle is shown.

What is the area, in square centimeters (cm²), of the right triangle?

42 cm²

Notes on Scoring

This response earns full credit (1 point). The student correctly calculates the area of the triangle. The student may multiply 6 \cdot 14 to get 84 and then divide the product by 2.
Sample Response: 1 point

A right triangle is shown.

14 cm

6 cm

What is the area, in square centimeters ($cm^2$), of the right triangle?

\[
\frac{84}{2} \text{ cm}^2
\]
Notes on Scoring

This response earns full credit (1 point). The student correctly calculates the area of the triangle. The student may multiply $6 \cdot 14$ to get 84, the area of a rectangle. The student may thereafter divide by 2 after having experiences in the classroom of discovering the formula for the area of the triangle by cutting rectangles into two identical triangular areas.
Sample Response: 0 points

A right triangle is shown.

What is the area, in square centimeters (cm²), of the right triangle?

84 cm²

Notes on Scoring

This response earns no credit (0 points). The student may correctly calculate 6 \cdot 14 to get 84, but they may forget that the area of a right triangle is half the area of a rectangle with the same base and height and consequently may not divide 84 by 2.
Sample Response: 0 points

A right triangle is shown.

14 cm

6 cm

What is the area, in square centimeters (cm²), of the right triangle?

20 cm²

Notes on Scoring

This response earns no credit (0 points). The student may add the two dimensions of the triangle together.
Question 33

Evelyn borrowed $30 from her mother to buy a sweater. After 3 weeks of babysitting, she pays her mother back $24.

What percent of the debt has Evelyn paid her mother back?

\[
\%
\]

1 2 3
4 5 6
7 8 9
.
-
Points Possible: 1

Content Cluster: Understand ratio concepts and use ratio reasoning to solve problems.

Content Standard: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3)
c. Find a percent of a quantity as a rate per 100, e.g., 30% of a quantity means 30/100 times the quantity; solve problems involving finding the whole, given a part and the percent.

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Calculator Designation: Calculator

Scoring Guidelines

Exemplar Response

- 80%

Other Correct Responses

- any equivalent value

For the item, a full-credit response includes

- the correct value (1 point).
Grade 6 Math
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Question 33

Sample Responses
Sample Response: 1 point

Evelyn borrowed $30 from her mother to buy a sweater. After 3 weeks of babysitting, she pays her mother back $24.

What percent of the debt has Evelyn paid her mother back?

80 %

Notes on Scoring

This response earns full credit (1 point). The student may correctly calculate \(24 \div 30 \cdot 100\) to get 80%.
Sample Response: 0 points

Evelyn borrowed $30 from her mother to buy a sweater. After 3 weeks of babysitting, she pays her mother back $24.

What percent of the debt has Evelyn paid her mother back?

This response earns no credit (0 points). The student may think that the question is asking for the amount of the debt Evelyn has left to pay and subtracts $24 from $30.
Sample Response: 0 points

Evelyn borrowed $30 from her mother to buy a sweater. After 3 weeks of babysitting, she pays her mother back $24.

What percent of the debt has Evelyn paid her mother back?

\[
\frac{94}{100} \% \]

Notes on Scoring

This response earns no credit (0 points). The student may try to convert \( \frac{24}{30} \) to a fraction with a denominator of 100 by adding 70 to both the numerator and the denominator, resulting in a fraction of \( \frac{94}{100} \), or 94%.
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Question 37

Question and Scoring Guidelines
Question 37

The theater club spends $1,197 for 63 student tickets. What is the rate per student that the club spends on tickets?

$ \hspace{2cm} \text{per student}

Points Possible: 1

Content Cluster: Understand ratio concepts and use ratio reasoning to solve problems.

Content Standard: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3)

b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts

Calculator Designation: Calculator
Scoring Guidelines

Exemplar Response

• $19

Other Correct Responses

• N/A

For the item, a full-credit response includes

• the correct value (1 point).
Sample Response: 1 point

The theater club spends $1,197 for 63 student tickets.

What is the rate per student that the club spends on tickets?

$ \ 19.00 \ \text{per student}

Notes on Scoring

This response earns full credit (1 point). The student correctly divides $1,197 by 63 to calculate the rate per student.
Sample Response: 0 points

The theater club spends $1,197 for 63 student tickets.
What is the rate per student that the club spends on tickets?

\[
\frac{1197}{63} \text{ per student}
\]

Notes on Scoring

This response earns no credit (0 points). In this case the student provides part of the computation instead of the requested result. Note: A real-world problem calls for a real-world response. Nobody would answer this question with "One thousand ninety-seven sixty-thirds dollars."
Sample Response: 0 points

The theater club spends $1,197 for 63 student tickets.
What is the rate per student that the club spends on tickets?

\[ \frac{1}{19} \text{ per student} \]

Notes on Scoring

This response earns no credit (0 points). The student may calculate a fraction equivalent to an incorrect value of 63/1197. Note: A real-world problem calls for a real-world response. Nobody would answer this question with “One nineteenth dollar”.

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Question 38

Question and Scoring Guidelines
Question 38

Julie is using the set {7, 8, 9, 10, 11} to solve the inequality shown.

\[ 2h - 3 > 15 \]

Select all of the solutions to the inequality.

☐ 7
☐ 8
☐ 9
☐ 10
☐ 11

Points Possible: 1

Content Cluster: Reason about and solve one-variable equations and inequalities.

Content Standard: Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. (6.EE.5)

Depth of Knowledge: Level 2
b. Interpret information from a simple graph
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
e. Compare and/or contrast figures or statements

Calculator Designation: Calculator
Scoring Guidelines

Rationale for the First Option: This is incorrect. The student may misunderstand the symbol and think that the left side of the inequality is “less than” 15.

Rationale for the Second Option: This is incorrect. The student may misunderstand the symbol and think that the left side of the inequality is “less than” 15.

Rationale for the Third Option: This is incorrect. The student may solve an equation instead of an inequality.

Rationale for the Fourth Option: Key – The student identifies a value that makes the inequality true.

Rationale for the Fifth Option: Key – The student identifies a value that makes the inequality true.

Sample Response: 1 point

Julie is using the set {7, 8, 9, 10, 11} to solve the inequality shown.

\[2h - 3 > 15\]

Select all of the solutions to the inequality.

- [ ] 7
- [ ] 8
- [ ] 9
- [ ] 10
- [x] 11
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Question 39

Question and Scoring Guidelines
Question 39

A bakery has three types of pie: apple, cherry, and peach. There are 4 times as many apple pies as peach pies.

What is a possible percentage for each type of pie?

Apple: \( \% \)

Cherry: \( \% \)

Peach: \( \% \)
Points Possible: 1

Content Cluster: Understand ratio concepts and use ratio reasoning to solve problems.

Content Standard: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (6.RP.3)

c. Find a percent of a quantity as a rate per 100, e.g., 30% of a quantity means 30/100 times the quantity; solve problems involving finding the whole, given a part and the percent.

Depth of Knowledge: Level 3

a. Interpret information from a complex graph
e. Use concepts to solve non-routine problems
f. Perform procedure with multiple steps and multiple decision points
m. Translate between a problem situation and symbolic notation that is not a direct translation
p. Draw conclusions from observations or data, citing evidence

Calculator Designation: Calculator

Scoring Guidelines

Exemplar Response

- Apple: 40%
- Cherry: 50%
- Peach: 10%

Other Correct Responses

- any three positive percentages for which the apple percentage is 4 times the peach percentage and the percentages add up to 100%

For the item, a full-credit response includes

- three correct percentages (1 point).
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Spring 2019 Item Release

Question 39

Sample Responses
Sample Response: 1 point

A bakery has three types of pie: apple, cherry, and peach. There are 4 times as many apple pies as peach pies.

What is a possible percentage for each type of pie?

**Apple:** 40 %

**Cherry:** 50 %

**Peach:** 10 %

Notes on Scoring

This response earns full credit (1 point). The student writes three percentages that satisfy the constraints of the problem.
Sample Response: 1 point

A bakery has three types of pie: apple, cherry, and peach. There are 4 times as many apple pies as peach pies.

What is a possible percentage for each type of pie?

*Apple:* 60 \(\%\)

*Cherry:* 25 \(\%\)

*Peach:* 15 \(\%\)

Notes on Scoring

This response earns full credit (1 point). The student writes three percentages that satisfy the constraints of the problem.
Sample Response: 0 points

A bakery has three types of pie: apple, cherry, and peach. There are 4 times as many apple pies as peach pies.

What is a possible percentage for each type of pie?

**Apple:** 50%

**Cherry:** 25%

**Peach:** 25%

Notes on Scoring

This response earns no credit (0 points). The student may see the 4 in the description of the situation and know that 25% is \( \frac{1}{4} \) of 100%. They may then write 25% for peach pies, and then double that number to show there are more apple pies than peach pies.
Notes on Scoring

This response earns no credit (0 points). The student may incorrectly calculate that 60% is 4 times as much as 20%.
Grade 6 Math
Spring 2019 Item Release

Question 40

Question and Scoring Guidelines
Question 40

This item has two parts.

**Part A.** Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school (−4, 1)
- post office (2, 1)
- library (2, −4)

Move each building to its correct location on the coordinate plane.
Part B. Jasmine walks from the school to the post office and then to the library. What is the total distance, in blocks, of her walk?

Points Possible: 2

Content Cluster: Apply and extend previous understandings of numbers to the system of rational numbers.

Content Standard: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (6.NS.8)

Depth of Knowledge: Level 2
b. Interpret information from a simple graph
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
i. Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps
j. Translate between tables, graphs, words and symbolic notation

Calculator Designation: Calculator Neutral
Scoring Guidelines

For 2 points, the response satisfies both of the bullets below.

- The student graphed the points correctly, providing evidence of the ability to graph points in the four quadrants of the coordinate plane to solve real-world problems.
- The student determined the total distance between the school, post office, and library, based on the information in Part A, providing evidence of the ability to use coordinates and absolute value to find distance between coordinates with the same first or second coordinate.

Exemplar Response

Part A

![Diagram showing points on a coordinate plane: School, Post Office, Library, 1 block distance between points]

Part B

11, or any equivalent value
For 1 point, the response satisfies one of the bullets.

Exemplar Response

Part A

10, or any value based on the information in Part A, or any equivalent value
Grade 6 Math
Spring 2019 Item Release

Question 40

Sample Responses
Sample Response: 2 points

This item has two parts.

**Part A.** Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school \((-4, 1)\)
- post office \((2, 1)\)
- library \((2, -4)\)

Move each building to its correct location on the coordinate plane.
Part B. Jasmine walks from the school to the post office and then to the library. What is the total distance, in blocks, of her walk?

11

Notes on Scoring

This response earns full credit (2 points). Part A: The student graphs the points correctly on the map. Part B: The student correctly determines the total distance Jasmine walked.
Sample Response: 1 point

This item has two parts.

Part A. Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school \((-4, 1)\)
- post office \((2, 1)\)
- library \((2, -4)\)

Move each building to its correct location on the coordinate plane.
**Part B.** Jasmine walks from the school to the post office and then to the library.

What is the total distance, in blocks, of her walk?

12

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**Notes on Scoring**

This response earns partial credit (1 point). Part A: The student graphs the points correctly on the map. Part B: The student may incorrectly determine the total distance Jasmine walked due to both the school and the library having -4 as one of their coordinates and think that there are 6 blocks from the post office to either location.
Sample Response: 1 point

This item has two parts.

Part A. Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school \((-4, 1)\)
- post office \((2, 1)\)
- library \((2, -4)\)

Move each building to its correct location on the coordinate plane.
Notes on Scoring

This response earns partial credit (1 point). Part A: The student incorrectly graphs the points on the map. The post office and the library are in incorrect locations. Part B: The student correctly calculates the total distance Jasmine walked based on the answer to part A.
Sample Response: 1 point

This item has two parts.

Part A. Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school \((-4, 1)\)
- post office \((2, 1)\)
- library \((2, -4)\)

Move each building to its correct location on the coordinate plane.
Notes on Scoring

This response earns partial credit (1 point). The student switches the x- and y-axes when plotting the coordinates and incorrectly plots each location on the map. Part B: The student correctly calculates the total distance Jasmine walked based on the answer to part A.

Part B. Jasmine walks from the school to the post office and then to the library.

What is the total distance, in blocks, of her walk?

11
Sample Response: 0 points

This item has two parts.

Part A. Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school (−4, 1)
- post office (2, 1)
- library (2, −4)

Move each building to its correct location on the coordinate plane.
Part B. Jasmine walks from the school to the post office and then to the library.

What is the total distance, in blocks, of her walk?

6

Notes on Scoring

This response earns no credit (0 points). Part A: The student graphs the point for the post office correctly but incorrectly switches x- and y-coordinates when graphing the points for the school and post office. Part B: The student may try to find the diagonal distance between the library and the school.
Sample Response: 0 points

This item has two parts.

**Part A.** Jasmine creates a map of her town on the coordinate plane. The unit on the coordinate plane is one block.

The locations of the school, post office, and library are given.

- school (−4, 1)
- post office (2, 1)
- library (2, −4)

Move each building to its correct location on the coordinate plane.
Part B. Jasmine walks from the school to the post office and then to the library.

What is the total distance, in blocks, of her walk?

9

Notes on Scoring

This response earns no credit (0 points). Part A: The student graphs the location for the post office in the correct location but then switches the locations when plotting the library and the school. Part B: The student may miss counting the block where the path intersects the axes and therefore does not count the correct distance.
Grade 6 Math
Spring 2019 Item Release
Question 41

Question and Scoring Guidelines
Question 41

Brian has 14 bins and 70 books. He places the same number of books, $x$, in each bin. Which equation could be used to find the number of books in each bin, $x$?

A $14 = \frac{x}{70}$
B $70 = 14x$
C $14 = 70 - x$
D $70 = 14 + x$

Points Possible: 1

Content Cluster: Reason about and solve one-variable equations and inequalities.

Content Standard: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which $p$, $q$ and $x$ are all nonnegative rational numbers. (6.EE.7)

Depth of Knowledge: Level 2
d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
j. Translate between tables, graphs, words and symbolic notation

Calculator Designation: Calculator Neutral
Scoring Guidelines

Rationale for Option A: This is incorrect. The student may think that there are 70 books in each bin and that \( x \) stands for the total number of books.

Rationale for Option B: Key – The student correctly identifies an equation that can be used to find the number of books in each bin. Since there are 14 bins that each have \( x \) books in them, \( x \) can be multiplied by 14 to calculate the total number of books, 70.

Rationale for Option C: This is incorrect. The student may think of division problems as repeated subtraction and tries to create an equation that “takes away” \( x \) number of books 14 times.

Rationale for Option D: This is incorrect. The student may think of the problem as adding books 14 times to get to 70.

Sample Response: 1 point

Brian has 14 bins and 70 books. He places the same number of books, \( x \), in each bin. Which equation could be used to find the number of books in each bin, \( x \)?

A  \[ 14 = \frac{x}{70} \]

B  \[ 70 = 14x \]

C  \[ 14 = 70 - x \]

D  \[ 70 = 14 + x \]
Grade 6 Math
Spring 2019 Item Release

Question 45

Question and Scoring Guidelines
Question 45

Which point is in the same quadrant as the point \((-1, 4)\)?

A. \((2, 3)\)
B. \((-2, 3)\)
C. \((2, -3)\)
D. \((-2, -3)\)

Points Possible: 1

Content Cluster: Apply and extend previous understandings of numbers to the system of rational numbers.

Content Standard: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. (6.NS.6)

b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

Depth of Knowledge: Level 1

a. Recall, observe, or recognize a fact, definition, term, or property

I. Locate numbers on a number line, or points on a coordinate grid

Calculator Designation: Calculator Neutral
Scoring Guidelines

Rationale for Option A: This is incorrect. The student may not take into consideration the negative sign in the x-value of the point referred to in the question.

Rationale for Option B: Key – The student chooses a point that is in the same quadrant as the point referred to in the question.

Rationale for Option C: This is incorrect. The student may confuse the negative sign in the y-value with the negative sign in the x-value of the point referred to in the question.

Rationale for Option D: This is incorrect. The student may think that the question asks for a point in a different quadrant.

Sample Response: 1 point

Which point is in the same quadrant as the point (−1, 4)?

A  (2, 3)
B  (−2, 3)
C  (2, −3)
D  (−2, −3)
Question 48

Farrah collects data on the number of letters in the names of several of her classmates. Her data are shown.

9, 5, 7, 6, 6, 9, 5, 5, 8, 8

What does the median tell Farrah about her data?

A. The data have a symmetrical shape.
B. A typical name has more than 9 letters.
C. Half of the names have fewer than 7 letters.
D. There is a variation of 4 letters in the names.

Points Possible: 1

Content Cluster: Develop understanding of statistical problem solving.

Content Standard: Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (6.SP.2)

Depth of Knowledge: Level 2

d. Solve a routine problem requiring multiple steps/decision points, or the application of multiple concepts
n. Compare, classify, organize, estimate, or order data

Calculator Designation: Calculator
Scoring Guidelines

Rationale for Option A: This is incorrect. The student may think that because there are an even number of data points the shape is symmetrical.

Rationale for Option B: This is incorrect. The student may interpret the data as presented without organizing it and mistakenly identify the “almost middle” 9 as the median.

Rationale for Option C: Key – The student selects the correct statement based on the median of the data. When organized, the median is 6.5, so that half of the names have less than 7 letters and half have 7 or more.

Rationale for Option D: This is incorrect. The student may confuse the median with the range.

Sample Response: 1 point

Farrah collects data on the number of letters in the names of several of her classmates. Her data are shown.

9, 5, 7, 6, 6, 9, 5, 5, 8, 8

What does the median tell Farrah about her data?

A The data have a symmetrical shape.

B A typical name has more than 9 letters.

C Half of the names have fewer than 7 letters.

D There is a variation of 4 letters in the names.