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New York State Testing Program
Grade 7 Common Core
Mathematics Test

Released Questions with Annotations

August 2014

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Grade 7 Common Core
Mathematics Test

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With the adoption of the New York P–12 Common Core Learning Standards (CCLS) in ELA/Literacy and Mathematics, the Board of Regents signaled a shift in both instruction and assessment. Starting in Spring 2013, New York State began administering tests designed to assess student performance in accordance with the instructional shifts and the rigor demanded by the Common Core State Standards (CCSS). To aid in the transition to new assessments, New York State has released a number of resources, including test blueprints and specifications, sample questions, and criteria for writing assessment questions. These resources can be found at http://www.engageny.org/common-core-assessments.

New York State administered the ELA/Literacy and Mathematics Common Core tests in April 2014 and is now making a portion of the questions from those tests available for review and use. These released questions will help students, families, educators, and the public better understand how tests have changed to assess the instructional shifts demanded by the Common Core and to assess the rigor required to ensure that all students are on track to college and career readiness.

Annotated Questions Are Teaching Tools

The released questions are intended to help educators, students, families, and the public understand how the Common Core is different. The annotated questions demonstrate the way the Common Core should drive instruction and how tests have changed to better assess student performance in accordance with the instructional shifts demanded by the Common Core. They are also intended to help educators identify how the rigor of the State tests can inform classroom instruction and local assessment. The annotations will indicate common student misunderstandings related to content standards; educators should use these to help inform unit and lesson planning. In some cases, the annotations may offer insight into particular instructional elements (conceptual thinking, visual models) that align to the Common Core that may be used in curricular design. It should not be assumed, however, that a particular standard will be measured with an identical question in future assessments.

The annotated questions will include both multiple-choice and constructed-response questions. With each multiple-choice question released, a rationale will be available to demonstrate why the question measures the intended standards; why the correct answer is correct; and why each wrong answer is plausible but incorrect. The rationales describe why the wrong answer choices are plausible but incorrect and are based on common errors in computation. While these rationales will speak to a possible and likely reason for selection of the incorrect option by the student, these rationales do not contain definitive statements as to why the student chose the incorrect option or what we can infer about knowledge and skills of the student based on the student's selection of an incorrect response. These multiple-choice questions are designed to assess student proficiency, not to diagnose specific misconceptions/errors with each and every incorrect option.

Additionally, for each constructed-response question, there will be an explanation for why the question measures the intended standards and sample student responses representing each possible score point.

Questions from the upper grades may feature more detailed annotations, as the question tend to be more complex.

Understanding Math Annotated Questions

Multiple Choice

Multiple-choice questions are designed to assess CCLS for Mathematics. Mathematics multiple-choice questions will mainly be used to assess standard algorithms and conceptual standards. Multiple-choice questions incorporate both Standards and Standards for Mathematical Practices, some in real-world applications. Many multiple-choice questions require students to complete multiple steps. Likewise, many of these questions are linked to more than one standard, drawing on the simultaneous application of multiple skills and concepts. Within answer choices, distractors will all be based on plausible missteps.

Short- and extended- constructed-response questions may refer to the scoring rubric, which can be found in the Educator Guide to the 2014 Grade 7 Common Core Mathematics Test at www.engageny.org/resource/test-guides-for-english-language-arts-and-mathematics.

Short Response

Short-response questions require students to complete a task and show their work. Like multiple-choice questions, short-response questions will often require multiple steps, the application of multiple mathematics skills, and real-world applications. Many of the short-response questions will cover conceptual and application standards.

Extended Response

Extended-response questions ask students to show their work in completing two or more tasks or a more extensive problem. Extended-response questions allow students to show their understanding of mathematical procedures, conceptual understanding, and application. Extended-response questions may also assess student reasoning and the ability to critique the arguments of others.

Released Questions Do Not Comprise a "Mini" Test

This document is NOT intended to show how operational tests look or to provide information about how teachers should administer the test; rather, the purpose of the released questions is to provide an overview of how the new test reflects the demands of the Common Core.

The released questions do not represent the full spectrum of standards assessed on the State test, nor do they represent the full spectrum of how the Common Core should be taught and assessed in the classroom. Specific criteria for writing test questions as well as additional instruction and assessment information is available at www.engageny.org/common-core-assessments.

Craig went bowling with $25 to spend. He rented shoes for $5.25 and paid $4.00 for each game. What was the greatest number of games Craig could have played?

A 4

B 5

C 6

D 7

Key: A
Measured CCLS: 7.EE.4b

Commentary: This question measures 7.EE.4b because it assesses a student's ability to solve word problems leading to inequalities of the form $px + q < r$, where p, q, and r are specific rational numbers. Additionally, students must be able to interpret the solution in the context of the problem; if the number of games Craig could have played is represented by x, then the solution statement $x < 4.9375$ must be interpreted in context as indicating a maximum of 4 games.

Extended Rationale

Answer Choice A: "4"; This response represents the correct solution to the word problem. The student may have set up and solved the inequality as shown below, where x represents the number of games played:

$4x + 5.25 < 25$

$4x < 19.75$

$x < 4.9375$

The student who selects this response understands that the greatest number of games played has to be a whole number less than 4.9375.

Answer Choice B: "5"; This response is incorrect and may occur when a student lacks understanding of how to write an inequality that models this situation, possibly writing incorrectly that $4x + 5.25 > 25$, where x represents the number of games played. The student may then assume that the greatest number of games played has to be 5, the closest whole number greater than 4.9375.

$4x + 5.25 > 25$

$4x > 19.75$

$x > 4.9375$

Answer Choice C: "6"; This response is incorrect and may occur when a student lacks understanding of how to write an inequality that models this situation, neglecting the effect of the shoe rental and possibly writing incorrectly that $4x < 25$, where x represents the number of games played.

$4x < 25$

$x < 6.25$

1

Answer Choice D: "7"; This response is incorrect and may occur when a student lacks understanding of how to write an inequality that models this situation, neglecting the effect of the shoe rental and possibly writing incorrectly that 4x > 25, where x represents the number of games played.

$4x > 25$

$x > 6.25$

Answer choices B, C, and D are plausible but incorrect. They represent common student errors made when solving word problems leading to inequalities of the form $px + q < r$, where p, q, and r are specific rational numbers.

The label on a $1\frac{1}{2}$-pound bag of wildflower seeds states that it will cover an area of 375 square feet. Based on this information, what is the number of square feet that 1 pound of wildflower seeds will cover?

A $\dfrac{1}{250}$

B 250

C $562\frac{1}{2}$

D 750

Key: B
Measured CCLS: 7.RP.1

Commentary: This question measures 7.RP.1 because it assesses the student's ability to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Extended Rationale

Answer Choice A: "$\dfrac{1}{250}$"; This response is incorrect and may occur if a student makes an error when solving using an equation. One possible error is shown below.

$$\frac{1\frac{1}{2}}{375} = \frac{1}{x}$$

$$1\frac{1}{2}x = 375$$

$$x = 250 \rightarrow \frac{1}{250} \text{ ft}^2$$

A student who selects this response may have limited understanding of how to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Answer Choice B: "250"; This answer represents the number of square feet that 1 pound of wildflower seeds will cover. The student may have used a method such as one of those shown below.

Method 1:
$$\frac{1\frac{1}{2}}{375} = \frac{1}{x}$$

$$1\frac{1}{2}x = 375$$

$$x = 250$$

Method 2:
$$1\,\text{lb} \times \frac{375\ \text{ft}^2}{1\frac{1}{2}\,\text{lb}} = 250\ \text{ft}^2$$

A student who selects this response understands how to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Answer Choice C: "$562\frac{1}{2}$"; This response is incorrect and may occur if a student makes an error when solving using an equation. One possible error is shown below.

$$\frac{1\frac{1}{2}}{1} = \frac{x}{375}$$

$$x = 562\frac{1}{2}$$

A student who selects this response may have limited understanding of how to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Answer Choice D: "750"; This response is incorrect and may occur if a student makes a series of errors when solving using an equation. One possible error is shown below.

$$\frac{1}{\left(1\frac{1}{2} - 1\right)} = \frac{x}{375}$$

$$\frac{1}{2}x = 375$$

$$x = 750$$

A student who selects this response may have limited understanding of how to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when computing unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.

Which expression is equivalent to $(7x - 5) - (3x - 2)$?

A $10x - 7$

B $10x - 3$

C $4x - 7$

D $4x - 3$

Key: D
Measured CCLS: 7.EE.1

Commentary: This question measures 7.EE.1 because it involves the application of properties of operations as strategies to subtract linear expressions. These expressions, $(7x - 5)$ and $(3x - 2)$, are considered linear because each term is either a constant or the product of a constant and the first power of a variable.

Extended Rationale

Answer Choice A: "$10x - 7$"; This response is incorrect and may reflect a lack of understanding of subtracting linear expressions. This error may occur when a student combines like terms without regard for the subtraction sign between the linear expressions. A student who selects this response may not understand how to correctly apply the negative sign when rearranging expressions or subtracting terms with negative constants.

Answer Choice B: "$10x - 3$"; This response is incorrect and may reflect a lack of understanding of subtracting linear expressions. The student may incorrectly have added $7x$ and $3x$ while correctly subtracting $-5 - (-2)$. A student who selects this response may not understand how to correctly apply the negative sign when rewriting expressions.

Answer Choice C: "$4x - 7$"; This response is incorrect and may reflect a lack of understanding of subtracting linear expressions. The student may have subtracted $7x - 3x$ but incorrectly added $-5 + (-2)$. A student who selects this response may not understand how to correctly subtract negative constants in expressions.

Answer Choice D: ""$4x - 3$"; This response represents the correct equivalent expression.

$(7x - 5) - (3x - 2) =$

$7x - 3x - 5 - (-2) =$

$4x - 3$

Answer choices A, B, and C are plausible but incorrect. They represent common student errors made when applying the properties of operations as strategies to subtract linear expressions.

The Lions won 16 games last year. This year the Lions won 20 games. What is the percent increase in the number of games the Lions won from last year to this year?

A   20%

B   25%

C   80%

D   125%

Key: B
Measured CCLS: 7.RP.3

Commentary: This question measures 7.RP.3 because it assesses the use of proportional relationships to solve a multi-step percent problem. This particular question involves calculating percent increase.

Extended Rationale

Answer Choice A: "20%"; This response is incorrect and may reflect a limited understanding of solving a percent problem. The student may have determined the increase in wins to be 4 but then applied an inappropriate proportional relationship by comparing 4 to the new win total of 20.

$$20 - 16 = 4$$

$$\frac{4}{20} = \frac{20}{100}$$

A student who selects this response may not yet have a conceptual understanding of how to use proportional relationships to solve multi-step ratio and percent problems.

Answer Choice B: "25%"; This response represents the correct percent increase in the number of games the Lions won from last year to this year.

$$\frac{20}{16} = \frac{125}{100}$$

$$125 - 100 = 25$$

A student who selects this response has an understanding of how to use proportional relationships to solve multi-step ratio and percent problems.

Answer Choice C: "80%"; This response is incorrect and may reflect a limited understanding of solving a percent problem. Instead of comparing the change in wins, 4, to last year's win total, the student may have compared last year's win total, 16, to this year's win total of 20.

$$\frac{16}{20} = \frac{80}{100}$$

A student who selects this response may not yet have an understanding of how to use proportional relationships to solve multi-step percent problems.

Answer Choice D: "125%"; This response is incorrect and may reflect a limited understanding of solving a percent problem. Instead of comparing the change in wins, 4, to last year's win total, the student may have compared this year's win total, 20, to last year's win total of 16.

$$\frac{20}{16} = \frac{125}{100}$$

A student who selects this response may not yet fully understand how to solve multi-step percent problems.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors made when using proportional relationships to solve multi-step ratio and percent problems.

The table shows prices for shoe rental, games, and snacks at the bowling alley.

BOWLING ALLEY PRICES

Item	Price
Shoe rental	$2.75
One game of bowling	$2.50
Small soda	$0.95
Large soda	$1.50
Nachos	$1.75

Gina rented shoes, bowled 3 games, and bought 1 order of nachos. She used a coupon for $\frac{1}{2}$ off the price of her bowling games. What was Gina's total cost before tax was added?

A $5.75

B $6.00

C $8.25

D $12.00

Key: C
Measured CCLS: 7.NS.3

Commentary: This question measures 7.NS.3 because it assesses the student's ability to solve real-world problems involving the four operations with rational numbers.

Extended Rationale

Answer Choice A: "$5.75"; This response is incorrect and may occur when a student has limited understanding of how to solve real-world problems involving the four operations with rational numbers. The student who selects this response may have neglected to multiply the cost of bowling one game by 3, since Gina bowled 3 games.

$x = 2.75 + \frac{(2.5)}{2} + 1.75$

$x = 2.75 + 1.25 + 1.75$

$x = 5.75$

Answer Choice B: "$6.00"; This response is incorrect and may occur when the student has limited understanding of how to solve real-world problems involving the four operations with rational numbers. The student may incorrectly have added up the cost of the shoe rental, the 3 games bowled, and the 1 order of nachos and then applied the $\frac{1}{2}$ off discount to the total instead of just to the games.

$$x = \frac{2.75 + 3(2.50) + 1.75}{2}$$

$$x = \frac{12}{2}$$

$$x = 6$$

Answer Choice C: "$8.25"; This response represents the correct total amount Gina paid. The student may have used the following representations to solve the problem:

$$x = 2.75 + \frac{3(2.5)}{2} + 1.75$$

$$x = 2.75 + 3.75 + 1.75$$

$$x = 8.25$$

The student who selects this response may understand how to set up and solve real-world problems involving the four operations with rational numbers.

Answer Choice D: "$12.00"; This response is incorrect and may occur when a student has limited understanding of how to solve real-world problems involving the four operations with rational numbers. The student may have neglected to take half off the price of the bowling games.

$$x = 2.75 + 3(2.5) + 1.75$$

$$x = 2.75 + 7.50 + 1.75$$

$$x = 12$$

Answer choices A, B, and D are plausible but incorrect. They represent common student errors made when solving real-world problems involving the four operations with rational numbers.

The population of a city is expected to increase by 7.5% next year. If p represents the current population, which expression represents the expected population next year?

A $1.75p$

B $1.075p$

C $p + 0.075$

D $1 + 0.075$

Key: B
Measured CCLS: 7.EE.2

Commentary: This question measures 7.EE.2 because it requires the student to write an expression to shed light on how the quantities in the expression are related in a problem context. In this case, the student writes the expression $1.075p$ to represent "the expected population next year," which may result from adding p, the current population, to $0.075p$, the expected increase in population next year. The expression $1.075p$ relates the current population to the expected population next year using the expected percent increase.

Extended Rationale

Answer Choice A: "$1.75p$"; This response is incorrect and may occur when a student incorrectly represents the expected increase with the expression $0.75p$ and then adds this to p. A student who selects this response may have insufficient understanding of how to write an expression to shed light on how the quantities in the expression are related in this problem context.

Answer Choice B: "$1.075p$"; This response represents the correct expression that shows the expected population in the following year. A student who selects this response understands how the quantities in the expression are related in this problem context.

Answer Choice C: "$p + 0.075$"; This response is incorrect and may occur when a student incorrectly represents the expected increase with the expression 0.075 and then adds this to p. A student who selects this response may have insufficient understanding of how to write an expression to shed light on how the quantities in the expression are related in this problem context.

Answer Choice D: "$1 + 0.075$"; This response is incorrect and may occur when a student incorrectly represents the current population with the expression 1 and the expected increase with the expression 0.075, and then adds these together. A student who selects this response may have insufficient understanding of how to write an expression to shed light on how the quantities in the expression are related in this problem context.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors made when writing an expression to shed light on how the quantities in the expression are related in a problem context.

Laticia randomly selected 25% of the seventh-grade students in her school and asked them their favorite season. Of the students surveyed, 51 chose summer as their favorite season. Based on the data, what is the most reasonable prediction of the number of seventh-grade students in her school who would choose summer as their favorite season?

A   15

B   75

C   150

D   200

Key: D
Measured CCLS: 7.SP.2

Commentary: This question measures 7.SP.2 because it assesses using data from a random sample to draw inferences about a population with an unknown characteristic of interest. From a random sample of 25% of the seventh-grade students, the student is asked to make an inference about the population of all seventh-grade students.

Extended Rationale

Answer Choice A: "15"; This response is incorrect and may occur when the student finds 25% of 51 and then rounds the answer to 15. A student who selects this response may not have an understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer Choice B: "75"; This response is incorrect and may occur when the student adds 51 and 25 and then rounds the answer to the nearest 5. A student who selects this response may not have an understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer Choice C: "150"; This response is incorrect and may occur when the student estimates 3 times 51 instead of 4 times 51.

$51 \times 3 \simeq 150$

A student who selects this response may not have an understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer Choice D: "200"; This response is the most reasonable prediction of the number of seventh-grade students in Laticia's school who would choose summer as their favorite season. Since 25% of the students were surveyed and 51 of those surveyed chose summer, it is reasonable that, because the sample was selected randomly, around 200 students in the entire population would choose summer.

$51 \times 4 \simeq 200$

A student who selects this response has an understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer choices A, B, and C are plausible but incorrect. They represent common student errors made when using data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Ms. Graves gave her class 12 minutes to read. Carrie read $5\frac{1}{2}$ pages in that time.

At what rate, in pages per hour, did Carrie read?

A $1\frac{1}{10}$

B   22

C $27\frac{1}{2}$

D   66

Key: C
Measured CCLS: 7.RP.1

Commentary: This question measures 7.RP.1 because it assesses the student's ability to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Extended Rationale

Answer Choice A: "$1\frac{1}{10}$"; This response is incorrect and may occur if a student makes an error when simplifying a complex fraction. One possible error is shown below.

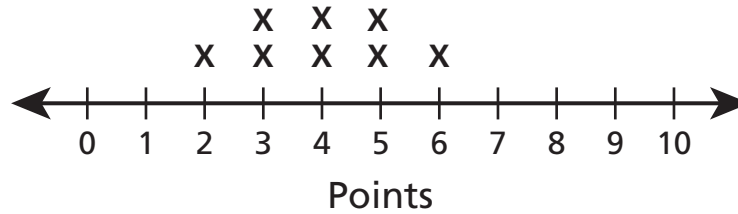$$\frac{5\frac{1}{2}}{\frac{12}{60}} \rightarrow 5\frac{1}{2} \times \frac{12}{60} = 1\frac{1}{10}$$

A student who selects this response may have limited understanding of how to compute unit rates associated with ratios of fractions.

Answer Choice B: "22"; This response is incorrect and may occur if a student makes an error when converting the time in minutes to the time in hours. One possible error is shown below.

$$5\frac{1}{2} \div \frac{12}{60} \rightarrow 5\frac{1}{2} \div \frac{1}{4} = 22$$

A student who selects this response may have limited understanding of how to compute unit rates associated with ratios of fractions of quantities measured in different units.

Answer Choice C: "$27\frac{1}{2}$"; This response represents the correct rate, in pages per hour, at which Carrie read. The student may have used a method such as one of those below.

Method 1:
$$\frac{5\frac{1}{2}}{\frac{12}{60}} = \frac{x}{1}$$

$$\frac{12}{60}x = 5\frac{1}{2}$$

$$x = 27\frac{1}{2}$$

Method 2:
$$\frac{5\frac{1}{2}\,\text{pgs}}{12\,\text{min}} \times \frac{60\,\text{min}}{1\,\text{hr}} = 27\frac{1}{2}\,\text{pgs/hr}$$

A student who selects this response understands how to solve real-world problems involving the computation of unit rates associated with ratios of fractions.

Answer Choice D: "66"; This response is incorrect and may occur if a student makes an error when simplifying a complex fraction. One possible error is shown below.

$$\frac{5\frac{1}{2}}{\frac{12}{60}} \rightarrow 5\frac{1}{2} \times 12 = 66$$

A student who selects this response may have limited understanding of how to compute unit rates involving complex fractions.

Answer choices A, B, and D are plausible but incorrect. They represent common student errors and misconceptions made when solving real-world problems involving the computation of unit rates associated with ratios of fractions.
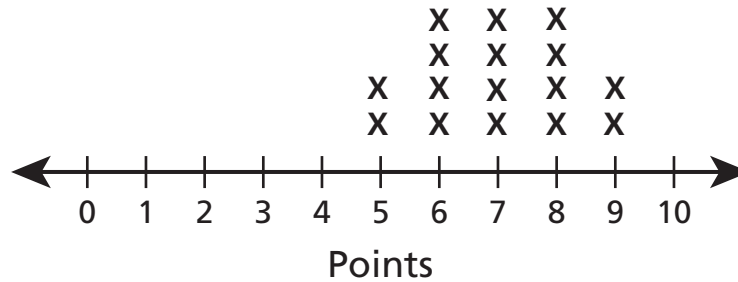
Ms. Andrews made the line plots below to compare the quiz scores for her first-period math class and her second-period math class. She gave the same quiz to each class.

QUIZ SCORES

First-Period Class

```
            X   X   X
        X   X   X   X   X
←———|———|———|———|———|———|———|———|———|———|———|———→
    0   1   2   3   4   5   6   7   8   9   10
```

Points

Second-Period Class

```
                            X   X   X
                            X   X   X
                        X   X   X   X   X
                        X   X   X   X   X
←———|———|———|———|———|———|———|———|———|———|———|———→
    0   1   2   3   4   5   6   7   8   9   10
```

Points

What conclusion can Ms. Andrews make about the performance of her first- and second-period classes?

A The first-period class had a higher median score than the second-period class.

B The second-period class scores had a higher mean than the first-period class scores.

C The first-period class scores had a greater range than the second-period class scores.

D The second-period class scores had a greater mean absolute deviation than the first-period class scores.

Key: B
Measured CCLS: 7.SP.3

Commentary: This question measures 7.SP.3 because it assesses the student's ability to informally assess and describe the degree of visual overlap of two numerical data distributions with similar variabilities.

Extended Rationale

Answer Choice A: "The first-period class had a higher median score than the second-period class." This response is incorrect and may occur if a student does not observe that most of the scores for second period are greater than most of the scores for first period. Students may also make an error when calculating the median of one or both of the classes rather than informally assessing the visual representation to determine the relative value of the two medians. A student who selects this response may have limited understanding of how to informally assess and describe the degree of visual overlap of two numerical data distributions with similar variabilities.

Answer Choice B: "The second-period class scores had a higher mean than the first-period class scores." This conclusion about Ms. Andrews' first- and second-period classes is best supported by the given data. The student may have observed that while the distributions have similar variabilities, most of the scores for second period are greater than most of the scores for first period. A student who selects this response understands how to informally assess and describe the degree of visual overlap of two numerical data distributions with similar variabilities.
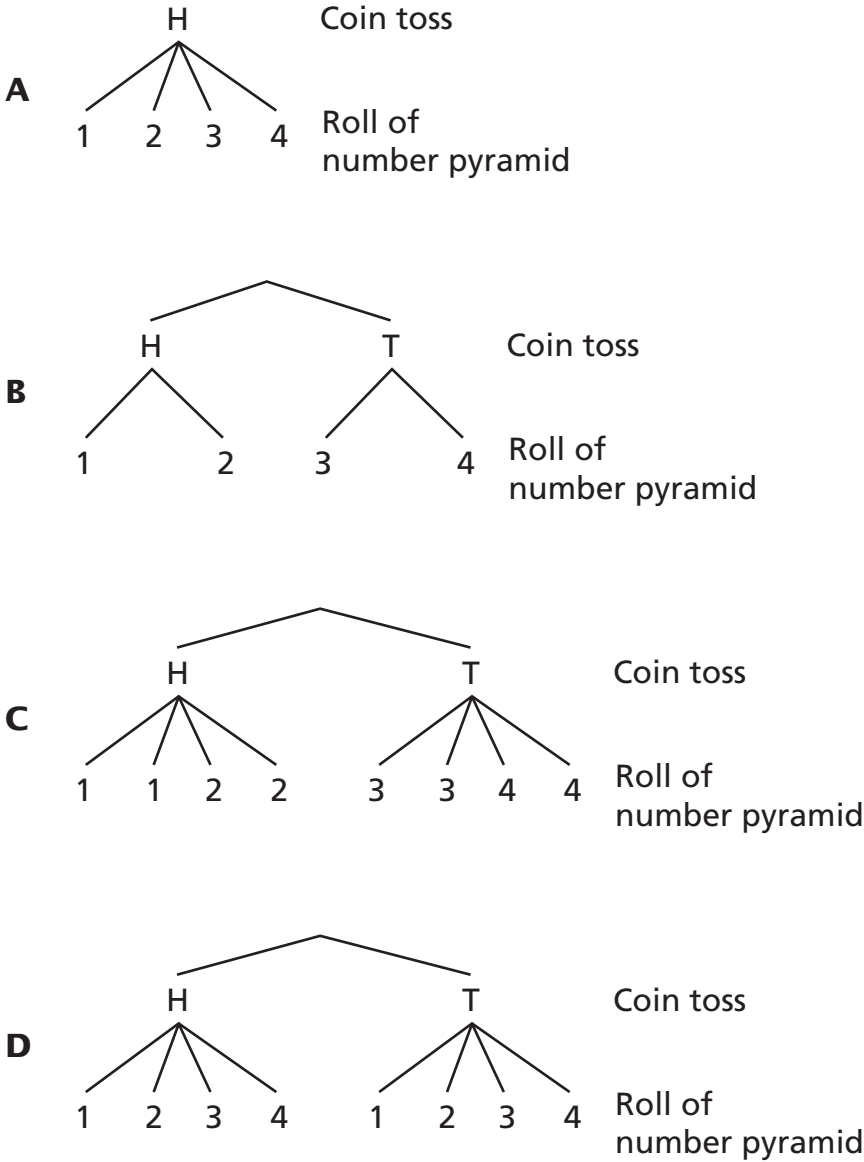
Answer Choice C: "The first-period class scores had a greater range than the second-period class scores." This response is incorrect and may occur if a student makes an error when calculating the range of one or both of the classes rather than informally assessing the visual representation to determine the relative value of the two ranges. A student who selects this response may have limited understanding of how to informally assess or describe the degree of visual overlap of two numerical data distributions with similar variabilities.

Answer Choice D: "The second-period class scores had a greater mean absolute deviation than the first-period class scores." This response is incorrect and may occur if a student makes an error when calculating the mean absolute deviation of one or both of the classes. A student who selects this response may have limited understanding of how to informally assess the degree of visual overlap of two numerical data distributions with similar variabilities.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when informally assessing the degree of visual overlap of two numerical data distributions with similar variabilities.

Which tree diagram shows all of the possible outcomes for tossing a coin and rolling a fair number pyramid that has four sides labeled 1 through 4?

A

```
            H          Coin toss
          /| |\
         1 2 3 4       Roll of
                       number pyramid
```

B

```
          /----\
         H      T       Coin toss
        / \    / \
       1   2  3   4     Roll of
                        number pyramid
```

C

```
         /------\
        H        T       Coin toss
      /|\\      /|\\
     1 1 2 2   3 3 4 4   Roll of
                         number pyramid
```

D

```
         /----\
        H      T          Coin toss
      /|\\    /|\\
     1 2 3 4  1 2 3 4     Roll of
                          number pyramid
```

Key: D
Measured CCLS: 7.SP.8b

Commentary: This question measures 7.SP.8b because it assesses the student's ability to use tree diagrams to represent the outcomes in the sample space for a compound event described in everyday language.

Extended Rationale

Answer Choice A: This response is incorrect and may occur if a student does not discern that only one of the two possible outcomes for the coin toss was represented. A student who selects this response may have limited

understanding of how to use tree diagrams to represent all of the outcomes in the sample space for a compound event.

Answer Choice B: This response is incorrect and may occur if a student does not notice that, for each possible outcome of the coin toss, only two of the four possible outcomes of rolling the number pyramid were represented. A student who selects this response may have limited understanding of how to use tree diagrams to represent all of the outcomes in the sample space for a compound event.

Answer Choice C: This response is incorrect and may occur if a student does not observe that, for each possible outcome of the coin toss, only two of the four possible outcomes of rolling the number pyramid were represented, and that each outcome of rolling the number pyramid was represented twice. A student who selects this response may have limited understanding of how to represent sample spaces for compound events using tree diagrams, and, for an event described in everyday language, identify the outcomes in the sample space which compose the event.

Answer Choice D: This tree diagram shows all possible outcomes of the given event. The student may have observed that, for each possible outcome of the coin toss, all possible outcomes of rolling the number pyramid were represented. A student who selects this response understands how to use tree diagrams to represent all of the outcomes in the sample space for a compound event.

Answer choices A, B, and C are plausible but incorrect. They represent common student errors and misconceptions made when representing sample spaces for compound events using tree diagrams, and, for an event described in everyday language, identifying the outcomes in the sample space which compose the event.

An owner of a small store knows that in the last week 54 customers paid with cash, 42 paid with a debit card, and 153 paid with a credit card. Based on the number of customers from last week, which fraction is closest to the probability that the next customer will pay with cash?

A $\dfrac{1}{5}$

B $\dfrac{1}{4}$

C $\dfrac{1}{3}$

D $\dfrac{1}{2}$

Key: A
Measured CCLS: 7.SP.6

Commentary: This question measures 7.SP.6 because it assesses the student's ability to approximate the probability of a chance event based on data collected on the chance event.

Extended Rationale

Answer Choice A: "$\dfrac{1}{5}$"; This response shows the fraction that is closest to the probability that the next customer will pay with cash. The student may have used a method such as the one below.

$$\frac{54}{(54 + 42 + 153)} \approx 0.22 \approx \frac{1}{5}$$

A student who selects this response understands how to approximate the probability of a chance event based on data collected on the chance event.

Answer Choice B: "$\dfrac{1}{4}$"; This response is incorrect and may occur if a student does not include 54 in the total number of customers.

$$\frac{54}{(42 + 153)} \approx 0.28 \approx \frac{1}{4}$$

A student who selects this response may have limited understanding of how to approximate the probability of a chance event based on data collected on the chance event.

Answer Choice C: "$\dfrac{1}{3}$"; This response is incorrect and may occur if a student determines the three possible outcomes, "cash," "debit card," and "credit card," but then incorrectly assumes that all three outcomes are equally likely to occur. A student who selects this response may have limited understanding of how to approximate the probability of a chance event based on data collected on the chance event.

Answer Choice D: "$\dfrac{1}{2}$"; This response is incorrect and may occur if a student determines two possible outcomes, "cash" and "not cash," and then uses $P(\text{cash}) = \dfrac{1}{2}$ for the experimental probability. A student

who selects this response may have limited understanding of how to approximate the probability of a chance event based on data collected on the chance event.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when approximating the probability of a chance event by collecting data on the chance process that produces it.

Scientists determined that Antarctica's average winter temperature was $-34.44°C$. The difference between this temperature and Antarctica's highest recorded temperature was 49.44 degrees. What was Antarctica's highest recorded temperature?

A $-83.88°C$

B $-15°C$

C $15°C$

D $83.88°C$

Key: C
Measured CCLS: 7.NS.3

Commentary: This question measures 7.NS.3 because it assesses the student's ability to solve a real-world problem involving operations with rational numbers.

Extended Rationale

Answer Choice A: "$-83.88°C$"; This response is incorrect and may occur if a student makes an error in setting up the equation that relates the average temperature and the highest recorded temperature, subtracting 49.44 from 34.44.

$-34.44°C - 49.44°C = -83.88°C$

A student who selects this response may have limited understanding of how to solve real-world problems involving operations with rational numbers.

Answer Choice B: "$-15°C$"; This response is incorrect and may occur if a student makes an error in setting up the equation that relates the average temperature and the highest recorded temperature, using the number 34.44 instead of -34.44.

$34.44°C - 49.44°C = -15°C$

A student who selects this response may have limited understanding of how to solve real-world problems involving operations with rational numbers.

Answer Choice C: "$15°C$"; This answer represents Antarctica's highest recorded temperature. The student may have used an equation such as the one below.

$-34.44 + 49.44 = 15$

A student who selects this response understands how to solve real-world problems involving operations with rational numbers.

Answer Choice D: "$83.88°C$";This response is incorrect and may occur if a student makes an error in setting up the equation that relates the average temperature and the highest recorded temperature, subtracting -34.44 from 49.44.

$49.44°C - (-34.44°C) = 83.88°C$

A student who selects this response may have limited understanding of how to solve real-world problems involving operations with rational numbers.

Answer choices A, B, and D are plausible but incorrect. They represent common student errors and misconceptions made when solving real-world problems involving operations with rational numbers.

The expression below was simplified using two properties of operations.

$$5(11z + 29 + 6z)$$

Step 1 $5(11z + 6z + 29)$

Step 2 $5(17z + 29)$

Step 3 $85z + 145$

Which properties were applied in Steps 1 and 3, respectively?

A   commutative property, then distributive property

B   commutative property, then identity property

C   associative property, then distributive property

D   associative property, then commutative property

Key: A
Measured CCLS: 7.EE.1

Commentary: This question measures 7.EE.1 because it assesses the student's ability to apply properties of operations as strategies used to add and expand linear expressions.

Extended Rationale

Answer Choice A: "commutative property, then distributive property"; This represents the properties that were applied in Steps 1 and 3, respectively. The student may have recognized that the commutative property was used in Step 1 because the terms 29 and 6z were rearranged within the parentheses. Then, the student may have recognized that the distributive property was used in Step 3 because terms in the parentheses were multiplied by 5. A student who selects this response understands how to recognize the properties of operations as strategies used to add and expand linear expressions.

Answer Choice B: "commutative property, then identity property"; This response is incorrect and may occur if a student does not recognize that the property applied to Step 3 was the distributive property, not the identity property. A student who selects this response may have limited understanding of how to recognize properties of operations as strategies used to add and expand linear expressions.

Answer Choice C: "associative property, then distributive property"; This response is incorrect and may occur if a student does not recognize that the property applied to Step 1 was the commutative property, not the associative property. The student may have assumed that the associative property was applied to Step 1, because the expression contains parentheses. A student who selects this response may have limited understanding of how to recognize properties of operations as strategies used to add and expand linear expressions.

Answer Choice D: "associative property, then commutative property"; This response is incorrect and may occur if a student does not recognize the properties applied to Steps 1 and 3. The student may have assumed that the associative property was applied to Step 1, because the expression contains parentheses. The student may have assumed that the commutative property was applied to Step 3, because the expression the

expression involves addition and addition is commutative. A student who selects this response may have limited understanding of how to recognize properties of operations used as strategies to add and expand linear expressions.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when recognizing properties of operations used as strategies to add and expand linear expressions.

For her cell phone plan, Heather pays $30 per month plus $0.05 per text. She wants to keep her bill under $60 per month. Which inequality represents the number of texts, t, Heather can send each month while staying within her budget?

A $t < 600$

B $t > 600$

C $t < 1,800$

D $t > 1,800$

Key: A
Measured CCLS: 7.EE.4b

Commentary: This question measures 7.EE.4b because it assesses the student's ability to solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers.

Extended Rationale

Answer Choice A: "$t < 600$"; This inequality correctly represents the number of texts, t, Heather can send each month while staying within her budget. The student may have written $0.05t + 30 < 60$ to model the situation and used a method such as the one below to solve the inequality.

$0.05t + 30 < 60$

$0.05t < 30$

$t < 600$

A student who selects this response understands how to solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers.

Answer Choice B: "$t > 600$"; This response is incorrect and may occur if a student uses the wrong inequality symbol, writing $0.05t + 30 > 60$ and solving as shown below.

$0.05t + 30 > 60$

$0.05t > 30$

$t > 600$

A student who selects this response may have limited understanding of how to model word problems involving inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers.

Answer Choice C: "$t < 1,800$"; This response is incorrect and may occur if a student misinterprets the $30 monthly fee as being subtracted from the cost of the texts, leading to the inequality $0.05t - 30 < 60$.

$0.05t - 30 < 60$

$0.05t < 90$

$t < 1,800$

A student who selects this response may have limited understanding of how to model word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers.

Answer Choice D: "$t > 1,800$"; This response is incorrect and may occur if a student uses the wrong inequality symbol and misinterprets the $30 monthly fee as being subtracted from the cost of the texts, leading to the inequality $0.05t - 30 > 60$.

$0.05t + 30 > 60$

$0.05t > 90$

$t > 1,800$

A student who selects this response may have limited understanding of how to model word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where *p, q,* and *r* are specific rational numbers.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when modeling and solving word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where *p, q,* and *r* are specific rational numbers.

Solve for *x*.

$$0.5x + 78.2 = 287$$

A $x = 104.4$

B $x = 417.6$

C $x = 495.8$

D $x = 730.4$

Key: B
Measured CCLS: 7.EE.4a

Commentary: This question measures 7.EE.4a because it assesses the student's ability to fluently solve an equation of the form $px + q = r$, where p, q, and r are specific rational numbers.

Extended Rationale

Answer Choice A: " $x = 104.4$ "; This response is incorrect and may occur if a student multiplies 208.8 by 0.5, instead of dividing, when transforming the equation.

$0.5x + 78.2 = 287$

$\qquad 0.5x = 208.8$

$\qquad\qquad \downarrow$

$\qquad\quad x = (0.5)208.8$

$\qquad\quad x = 104.4$

A student who selects this response may be unable to fluently solve equations of the form $px + q = r$, where p, q, and r are specific rational numbers.

Answer Choice B: " $x = 417.6$ "; This answer represents the correct value of x that makes the given equation true. The student may have used a method such as the one below.

$0.5x + 78.2 = 287$

$\qquad 0.5x = 208.8$

$\qquad\quad x = 417.6$

A student who selects this response understands how to fluently solve equations of the form $px + q = r$, where p, q, and r are specific rational numbers.

Answer Choice C: "$x = 495.8$"; This response is incorrect and may occur if a student divides 287 by 0.5 when transforming the equation.

$$0.5x + 78.2 = 287$$

$$\downarrow$$

$$x + 78.2 = \frac{287}{0.5}$$

$$x + 78.2 = 574$$

$$x = 495.8$$

A student who selects this response may be unable to fluently solve equations of the form $px + q = r$, where p, q, and r are specific rational numbers.

Answer Choice D: "$x = 730.4$"; This response is incorrect and may occur if a student adds 78.2 to 287 when transforming the equation.

$$0.5x + 78.2 = 287$$

$$\downarrow$$

$$0.5x = 287 + 78.2$$

$$0.5x = 365.2$$

$$x = 730.4$$

A student who selects this response may be unable to fluently solve equations of the form $px + q = r$, where p, q, and r are specific rational numbers.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when fluently solving equations of the form $px + q = r$, where p, q, and r are specific rational numbers.

Katie bought 4 sweaters that each cost the same amount and 1 skirt that cost $20. The items she bought cost a total of $160 before tax was added. What was the cost of each sweater?

A $20

B $35

C $40

D $45

Key: B
Measured CCLS: 7.EE.4a

Commentary: This question measures 7.EE.4a because it measures the ability to solve a word problem leading to an equation of the form $px + q = r$, where p, q, and r are specific rational numbers. In this case the situation leads to the equation $4x + 20 = 160$, where x represents the cost of each sweater.

Extended Rationale

Answer Choice A: "$20"; This response is incorrect and may occur when a student incorrectly uses the equation $4x = 160$ to represent the situation, neglecting to account for the cost of the skirt. The student may have also thought that since 2 types of products were bought (sweaters and a skirt), the solution to the equation needed to be divided by 2.

$4x = 160$

$x = 40$

$40 \div 2 = 20$

A student who selects this response may not yet understand how an equation in the form of $px + q = r$ can be used to solve a word problem.

Answer Choice B: "$35"; This response represents the correct cost of each sweater, $35, which results from solving the equation $4x + 20 = 160$. The student who selects this response understands how to solve the given word problem.

$4x + 20 = 160$

$4x = 140$

$x = 35$

Answer Choice C: "$40"; This response is incorrect and may occur when a student incorrectly uses the equation $4x = 160$ to represent the situation, neglecting to account for the cost of the skirt.

$4x = 160$

$x = 40$

A student who selects this response may not yet understand how an equation in the form of $px + q = r$ can be used to solve a word problem.

Answer Choice D: "$45"; This response is incorrect and may occur when a student incorrectly uses the equation 4*x* +160 = 20 to represent the situation. The student may have then continued to solve the equation incorrectly by adding 160 to both sides of the equation.

$4x + 160 = 20$

$4x = 180$

$x = 45$

A student who selects this response may not yet understand how an equation in the form of $px + q = r$ can be used to solve a word problem. The student may also not understand how to solve equations of the form $px + q = r$.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors made when solving word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers.

Jocelyn was shopping at a farmers' market. She observed the prices of cucumbers at several stands. Which sign shows a proportional relationship in the pricing of the cucumbers?

A

Joe's Stand

5 cucumbers for $2.50
10 cucumbers for $4.00
15 cucumbers for $5.50
20 cucumbers for $7.00

C

Betty's Stand

5 cucumbers for $2.00
10 cucumbers for $4.00
15 cucumbers for $6.00
20 cucumbers for $8.00

B

Steve's Stand

5 cucumbers for $2.50
10 cucumbers for $4.50
15 cucumbers for $6.50
20 cucumbers for $8.50

D

Lula's Stand

5 cucumbers for $1.50
10 cucumbers for $3.00
15 cucumbers for $6.00
20 cucumbers for $12.00

Key: C
Measured CCLS: 7.RP.2a

Commentary: This question measures 7.RP.2a because it assesses the student's ability to decide whether two quantities are in a proportional relationship.

Extended Rationale

Answer Choice A: This response is incorrect and may occur if a student observes that the prices increased consistently by $1.50 as the number of cucumbers increased in increments of 5, but does not compare the cost per cucumber for each row.

2.50 $(+ 1.50) = 4.00$
4.00 $(+ 1.50) = 5.50$
5.50 $(+ 1.50) = 7.00$

A student who selects this response may have limited understanding of how to decide whether two quantities are in a proportional relationship.

Answer Choice B: This response is incorrect and may occur if a student observes that the prices increased consistently by $2.00 as the number of cucumbers increased in increments of 5, but does not compare the cost per cucumber for each row.

$2.50 \ (+ \ 2.00) = 4.50$
$4.50 \ (+ \ 2.00) = 6.50$
$6.50 \ (+ \ 2.00) = 8.50$

A student who selects this response may have limited understanding of how to decide whether two quantities are in a proportional relationship.

Answer Choice C: This sign shows a proportional relationship in the pricing of the cucumbers. The student may have recognized that the cost per cucumber is consistently $0.40, as shown below.

$$\$0.40 = \frac{2}{5} = \frac{4}{10} = \frac{6}{15} = \frac{8}{20}$$

A student who selects this response understands how to decide whether two quantities are in a proportional relationship.

Answer Choice D: This response is incorrect and may occur if a student observes that the prices doubled as the number of cucumbers increased in increments of 5, but does not compare the cost per cucumber for each row.

$1.50 \ (\times 2) = 3.00$
$3.00 \ (\times 2) = 6.00$
$6.00 \ (\times 2) = 12.00$

A student who selects this response may have limited understanding of how to decide whether two quantities are in a proportional relationship.

Answer choices A, B, and D are plausible but incorrect. They represent common student errors and misconceptions made when deciding whether two quantities are in a proportional relationship.

Doug earns $10.50 per hour working at a restaurant. On Friday he spent $1\frac{3}{4}$ hours cleaning, $2\frac{1}{3}$ hours doing paperwork, and $1\frac{5}{12}$ hours serving customers. What were Doug's earnings?

A $46.97

B $47.25

C $53.00

D $57.75

Key: D
Measured CCLS: 7.EE.3

Commentary: This question measures 7.EE.3 because it assesses the student's ability to solve a multi-step real-life problem posed with positive rational numbers by applying properties of operations to calculate with numbers in any form and convert between forms as appropriate.

Extended Rationale

Answer Choice A: "$46.97"; This response is incorrect and may occur if a student makes a computational error in adding fractions while determining the total number of hours that Doug worked.

$$\$10.50\left(1\frac{3}{4} + 2\frac{1}{3} + 1\frac{5}{12}\right) \rightarrow \$10.50\left(4\frac{9}{19}\right)$$

$$\$10.50\left(4\frac{9}{19}\right) \approx \$46.97$$

A student who selects this response may have limited understanding of how to solve multi-step real-life problems that require calculations with positive rational numbers presented in any form.

Answer Choice B: "$47.25"; This response is incorrect and may occur if a student makes a computational error in adding fractions while determining the total number of hours that Doug worked.

$$\$10.50\left(1\frac{3}{4} + 2\frac{1}{3} + 1\frac{5}{12}\right) \rightarrow \$10.50\left(4\frac{1}{2}\right)$$

$$\$10.50\left(4\frac{1}{2}\right) = \$47.25$$

A student who selects this response may have limited understanding of how to solve multi-step real-life problems that require calculations with positive rational numbers presented in any form.

Answer Choice C: "$53.00"; This response is incorrect and may occur if a student makes an error when determining Doug's earnings, not applying the distributive property when necessary.

$$\$10.50\left(1\frac{3}{4} + 2\frac{1}{3} + 1\frac{5}{12}\right) =$$

$$\$10.50(5.5) \rightarrow \$10.50(5) + \$0.50$$

$$\$10.50(5) + \$0.50 = \$53.00$$

A student who selects this response may have limited understanding of how to solve multi-step real-life problems that require calculations with positive rational numbers presented in any form and convert between forms as appropriate.

Answer Choice D: "$57.75"; This answer represents the value of Doug's earnings. The student may have used a method such as one of those below.

Method 1: $\$10.50\left(1\frac{3}{4} + 2\frac{1}{3} + 1\frac{5}{12}\right) =$

$\quad\quad\quad\quad \$10.50(5.5) = \$57.75$

Method 2: $\$10.50\left(1\frac{3}{4}\right) = \$18.375$

$\quad\quad\quad\quad \$10.50\left(2\frac{1}{3}\right) = \$24.50$

$\quad\quad\quad\quad \$10.50\left(1\frac{5}{12}\right) = \$14.875$

$\quad\quad\quad\quad \$18.375 + \$24.50 + \$14.875 = \$57.75$

A student who selects this response understands how to solve multi-step real-life problems posed with positive rational numbers in any form and apply properties of operations to calculate with positive rational numbers in any form and convert between forms as appropriate.

Answer choices A, B, and C are plausible but incorrect. They represent common student errors and misconceptions made when solving multi-step real-life problems posed with positive rational numbers.

The test scores of the students in Mr. Duffy's class are shown on the line plot below.

MR. DUFFY'S CLASS
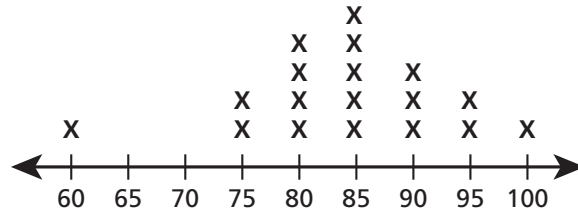
Most of the students in Ms. Guzman's class scored higher than most of the students in Mr. Duffy's class on the same test. Which line plot could represent the test scores of the students in Ms. Guzman's class?
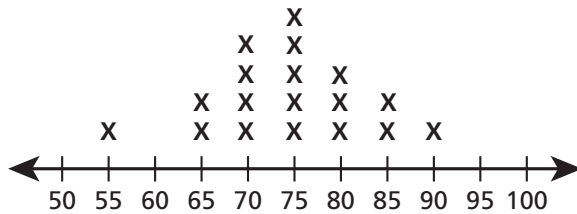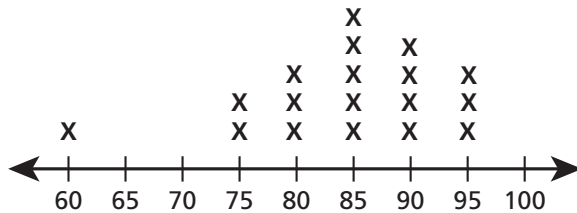
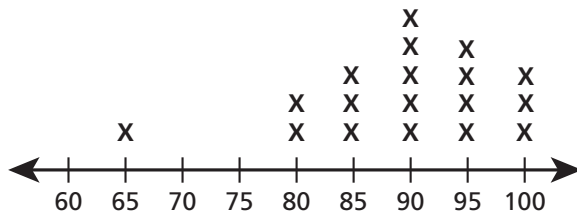**MS. GUZMAN'S CLASS**

A
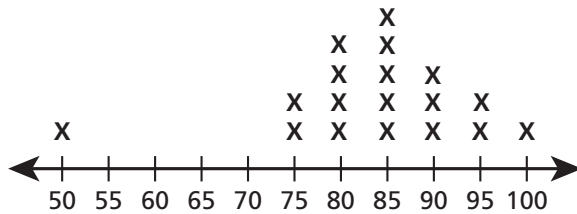
MS. GUZMAN'S CLASS

B

MS. GUZMAN'S CLASS

C

MS. GUZMAN'S CLASS

D

Key: D
Measured CCLS: 6.SP.2

Commentary: This question measures 6.SP.2 because it assesses the student's ability to understand that a set of data collected to answer a statistical question has a distribution which can be described by its center and overall shape. Standard 6.SP.2 is designated as May-to-June in Grade 6. As indicated in the educator guide, test questions may assess standards from previous grades.

Extended Rationale

Answer Choice A: This response is incorrect and may occur if a student does not recognize that the center and overall shape of these data is similar to that of Mr. Duffy's class. A student who selects this response may have limited understanding of how a set of data collected to answer a statistical question has a distribution which can be described by its center and overall shape.

Answer Choice B: This response is incorrect and may occur if a student recognizes that the overall shape of the distribution of this line plot is very similar to that of Mr. Duffy's class but does not recognize that the mean value of this class is lower than that of Mr. Duffy's class. A student who selects this response may have limited understanding of how a set of data collected to answer a statistical question has a distribution which can be described by its center and overall shape.

Answer Choice C: This response is incorrect and may occur if a student does not recognize that the center and overall shape of these data is similar to that of Mr. Duffy's class. A student who selects this response may have limited understanding of how a set of data collected to answer a statistical question has a distribution which can be described by its center and overall shape.

Answer Choice D: This line plot represents a class where most students scored higher than most of the students in Mr. Duffy's class. The student may have recognized that the overall shape of the distribution of this line plot is very similar to that of Mr. Duffy's class, but the mean value of this class is higher than that of Mr. Duffy's class. The student who selects this response understands that a set of data collected to answer a statistical question has a distribution which can be described by its center and overall shape.

Answer choices A, B, and C are plausible but incorrect. They represent common student errors and misconceptions made when understanding that a set of data collected to answer a statistical question has a distribution which can be described by its center and overall shape.

A store sold 650 bicycles last year. This year the store sold 572 bicycles. What is the percent decrease in the number of bicycles sold from last year to this year?

A 12%

B 14%

C 78%

D 88%

Key: A
Measured CCLS: 7.RP.3

Commentary: This question measures 7.RP.3 because it assesses the student's ability to use a proportional relationship to solve a multistep percent problem.

Extended Rationale

Answer Choice A: "12%"; This response shows the correct percent decrease in the number of bicycles sold from last year to this year. The student may have used a method such as one of those below.

Method 1: $\dfrac{(650 - 572)}{650} \times 100 = 12\%$

Method 2: $650 - 572 = 78$

$\dfrac{78}{650} \times 100 = 12\%$

A student who selects this response understands how to use proportional relationships to solve multistep percent problems.

Answer Choice B: "14%"; This response is incorrect and may occur if a student divides the change in the number of bicycles sold by 572.
$\dfrac{(650 - 572)}{572} \times 100 \approx 14\%$
A student who selects this response may have limited understanding of how to use proportional relationships to solve multistep percent problems.

Answer Choice C: "78%"; This response is incorrect and may occur if a student finds the change in the number of bicycles sold and erroneously labels number as a percent.
$650 - 572 = 78$
A student who selects this response may have limited understanding of how to use proportional relationships to solve multistep percent problems.

Answer Choice D: "88%"; This response is incorrect and may occur if a student finds the percent of 650 represented by 572.
$\dfrac{572}{650} \times 100 = 88\%$

A student who selects this response may have limited understanding of how to use proportional relationships to solve multistep percent problems.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when using proportional relationships to solve multistep ratio and percent problems.

Sammy drew a rectangle that was *w* inches wide. The expression $2(2w) + 2(w)$ represents the perimeter of the rectangle that Sammy drew. Which statement relates the perimeter to the width of the rectangle?

A   The perimeter is 6 inches more than the width.

B   The perimeter is 6 times the width.

C   The perimeter is 2 inches more than the width.

D   The perimeter is 2 times the width.

Key: B
Measured CCLS: 7.EE.2

Commentary: This question measures 7.EE.2 because it assesses the student's ability to understand how different forms of an expression in a problem context can shed light on how the quantities are related.

Extended Rationale

Answer Choice A: "The perimeter is 6 inches more than the width." This response is incorrect and may occur if a student misinterprets the meaning of 6*w* as "six more than *w*."

$$2(2w) + 2(w) =$$
$$4w + 2w =$$
$$6w =$$

A student who selects this response may have limited understanding of how to rewrite an expression in different forms in order to shed light on the problem and correctly interpret how the quantities in it are related.

Answer Choice B: "The perimeter is 6 times the width." This statement correctly relates the perimeter to the width of the rectangle. The student may have used a method such as the one below.

$$2(2w) + 2(w) =$$
$$4w + 2w =$$
$$6w =$$

A student who selects this response understands that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.

Answer Choice C: "The perimeter is 2 inches more than the width." This response is incorrect and may occur if a student compares the length and width of the rectangle, instead of the perimeter and the width, and then misinterprets the result as "2 inches more than the width."

$$\frac{2w}{w} = 2$$

A student who selects this response may have a limited understanding of how to rewrite an expression in different forms in a problem context in order to shed light on the problem and correctly interpret how the quantities in it are related.

Answer Choice D: "The perimeter is 2 times the width." This response is incorrect and may occur if a student compares the length and width of the rectangle, instead of the perimeter and the width.

$$\frac{2w}{w} = 2$$

A student who selects this response may have a limited understanding of how to rewrite an expression in different forms in a problem context in order to shed light on the problem and correctly interpret how the quantities in it are related.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when understanding that rewriting an expression in different forms in a problem context can shed light on how the quantities in it are related.

Sally has a discount card that reduces the price of her grocery bill in a certain grocery store by 5%. If c represents the cost of Sally's groceries, which expression represents Sally's grocery bill?

A $0.05c$

B $0.95c$

C $c - 0.05$

D $c + 0.95$

Key: B
Measured CCLS: 7.EE.2

Commentary: This question measures 7.EE.2 because it assesses the student's ability to rewrite an expression in a different form in a problem context in order to show how the quantities in it are related.

Extended Rationale

Answer Choice A: "$0.05c$"; This response is incorrect and may occur if a student writes an expression for the amount of the discount instead of the amount of the bill after the discount. A student who selects this response may have limited understanding of how to rewrite an expression in different forms in a problem context in order to show how the quantities in it are related.

Answer Choice B: "$0.95c$"; This expression correctly represents Sally's grocery bill. The student may have used a method such as the one below.
$c(1 - 0.05) = 0.95c$

A student who selects this response understands how to rewrite an expression in different forms in a problem context in order to show how the quantities in it are related.

Answer Choice C: "$c - 0.05$"; This response is incorrect and may occur if a student does not understand that the discount was 5% of c, the total cost of the groceries not subtracting 0.05 from c. A student who selects this response may have limited understanding of how to rewrite an expression in different forms in a problem context in order to show how the quantities in it are related.

Answer Choice D: "$c + 0.95$."; This response is incorrect and may occur if a student does not understand that the amount of the bill after the discount was 95% of c, the total cost of the groceries not adding 0.95 to c. A student who selects this response may have limited understanding of how to rewrite an expression in different forms in a problem context in order to show how the quantities in it are related.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when rewriting an expression in order to show how the quantities in it are related.

The cost of oranges in a grocery store is directly proportional to the number of oranges purchased. Jerri paid $2.52 for 6 oranges. If p represents the cost, in dollars, and n represents the number of oranges purchased, which equation best represents this relationship?

A $p = 0.42n$

B $p = 2.52n$

C $p = 6n$

D $p = 15.12n$

Key: A
Measured CCLS: 7.RP.2c

Commentary: This question measures 7.RP.2c because it assesses the student's ability to represent a proportional relationship by an equation.

Extended Rationale

Answer Choice A: "$p = 0.42n$"; This equation correctly represents the relationship between p, the cost, in dollars, of oranges at the grocery store, and n, the number of oranges purchased. The student may have used a method such as the one below to determine the unit rate and then set up the appropriate equation using this value.

$$\frac{\$2.52}{6 \text{ oranges}} = \$0.42 \text{ / orange}$$

A student who selects this response understands how to represent proportional relationships by equations.

Answer Choice B: "$p = 2.52n$"; This response is incorrect and may occur if a student interprets the total amount paid for the 6 oranges as the unit rate and then sets up an equation using this value. A student who selects this response may have limited understanding of how to represent proportional relationships by equations.

Answer Choice C: "$p = 6n$"; This response is incorrect and may occur if a student interprets the total number of oranges as the unit rate and then sets up an equation using this value. A student who selects this response may have limited understanding of how to represent proportional relationships by equations.

Answer Choice D: "$p = 15.12n$"; This response is incorrect and may occur if a student multiplies 2.52, the total cost of the oranges, by 6, the total number of oranges, to determine the unit rate, and then sets up an equation using this value.

$$2.52 \times 6 = 15.12$$

A student who selects this response may have limited understanding of how to represent proportional relationships by equations.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when representing proportional relationships by equations.

The scale of a model train is 1 inch to 13.5 feet. One of the cars of the model train is 5 inches long. What is the length, in feet, of the actual train car?

A 67.5

B 32.4

C 14.5

D 2.7

Key: A
Measured CCLS: 7.G.1

Commentary: This question measures 7.G.1 because it assesses the student's ability to solve a problem involving the computation of actual lengths of an object based on the scale of a model.

Extended Rationale

Answer Choice A: "67.5"; This answer represents the correct length, in feet, of the actual train car. The student may have used a method such as the one below.

$$5 \text{ in.} \times \frac{13.5 \text{ ft}}{1 \text{ in.}} = 67.5 \text{ ft}$$

A student who selects this response understands how to solve problems involving the computation of actual lengths of an object based on the scale of a model.

Answer Choice B: "32.4"; This response is incorrect and may occur if a student makes an error when setting up an equation to solve the problem and attempts to use the conversion factor $12 \text{ in.} = 1 \text{ ft}$. One possible incorrect equation is shown below.

$$\frac{5}{12} = \frac{13.5}{x}$$

$$5x = 162$$

$$x = 32.4$$

A student who selects this response may have limited understanding of how to solve problems involving the computation of actual lengths of an object based on the scale of a model.

Answer Choice C: "14.5"; This response is incorrect and may occur if a student makes an error interpreting the scale of the drawing, "1 inch to 13.5 feet." The student may have interpreted this as $1 \text{ in.} + 13.5 \text{ ft} = 14.5 \text{ ft}$ and concluded that "14.5" is the answer. A student who selects this response may have limited understanding of how to solve problems involving the computation of actual lengths of an object based on the scale of a model.

Answer Choice D: "2.7"; This response is incorrect and may occur if a student makes an error when setting up an equation to solve the problem. One possible incorrect equation is shown below.

$$\frac{1}{5} = \frac{x}{13.5}$$

$$5x = 13.5$$

$$x = 2.7$$

A student who selects this response may have limited understanding of how to solve problems involving the computation of actual lengths of an object based on the scale of a model.

Answer choices B, C, and D are plausible but incorrect. They represent student errors and misconceptions made when solving problems involving the computation of actual lengths of an object based on the scale of a model.

Charis invested $140. She earned a simple interest of 3% per year on the initial investment. If no money was added or removed from the investment, what was the amount of interest Charis received at the end of two years?

A $4.20

B $6.00

C $8.40

D $12.60

Key: C
Measured CCLS: 7.RP.3

Commentary: This question measures 7.RP.3 because it assesses the student's ability to use proportional relationships to solve a multistep percent problem.

Extended Rationale

Answer Choice A: "$4.20"; This response is incorrect and may occur if a student finds the interest Charis would have received at the end of one year.

$140 \times 0.03 = \$4.20$

A student who selects this response may have limited understanding of how to solve a multistep percent problem.

Answer Choice B: "$6.00"; This response is incorrect and may occur if a student misinterprets 3% of $140 as a payment of $3.00 in interest every year.

$\$3.00 \times 2 = \$6.00$

A student who selects this response may have limited understanding of how to use proportional relationships to solve a multistep percent problem.

Answer Choice C: "$8.40"; This response correctly shows the amount of interest Charis received at the end of two years. The student may have used a method such as the one below.

$\$140 \times 0.03 \times 2 = \$8.40$

A student who selects this response understands how to use proportional relationships to solve a multistep percent problem.

Answer Choice D: "$12.60"; This response is incorrect and may occur if a student multiplies $140 by 3, and then determines 3% of the product.

$\$140 \times 3 \times 0.03 = \$12.60$

A student who selects this response may have limited understanding of how to use proportional relationships to solve a multistep percent problem.

Answer choices A, B, and D are plausible but incorrect. They represent common student errors and misconceptions made when using proportional relationships to solve a multistep percent problem.

Which expression is equivalent to $4.8 + 2.2w - 1.4w + 2.4$?

A $0.4(6 + 2w)$

B $0.8(9 + w)$

C $1.6(3 + 2w)$

D $3.6(2 + w)$

Key: B
Measured CCLS: 7.EE.1

Commentary: This question measures 7.EE.1 because it assesses the student's ability to apply properties of operations to add, subtract, and factor linear expressions with rational coefficients.

Extended Rationale

Answer Choice A: "$0.4(6 + 2w)$"; This response is incorrect and may occur if a student makes an error when combining like terms.

$4.8 + 2.2w - 1.4w + 2.4 \rightarrow (4.8 - 2.4) + 0.8w$

$(4.8 - 2.4) + 0.8w = 2.4 + 0.8w = 0.4(6 + 2w)$

A student who selects this response may have limited understanding of how to apply properties of operations to add, subtract, and factor linear expressions with rational coefficients.

Answer Choice B: "$0.8(9 + w)$"; This represents an expression that is equivalent to the given expression. The student may have used a method such as the one below.

$4.8 + 2.2w - 1.4w + 2.4 = 7.2 + 0.8w = 0.8(9 + w)$

A student who selects this response understands how to apply properties of operations to add, subtract, and factor linear expressions with rational coefficients.

Answer Choice C: "$1.6(3 + 2w)$"; This response is incorrect and may occur if a student makes an error when combining like terms.

$4.8 + 2.2w - 1.4w + 2.4 \rightarrow 4.8 + (2.2 - 1.4 + 2.4)w$

$4.8 + (2.2 - 1.4 + 2.4)w = 4.8 + 3.2w = 1.6(3 + 2w)$

A student who selects this response may have limited understanding of how to apply properties of operations to add, subtract, and factor linear expressions with rational coefficients.

Answer Choice D: "$3.6(2 + w)$"; This response is incorrect and may occur if a student makes an error when combining like terms.

$4.8 + 2.2w - 1.4w + 2.4 \rightarrow 7.2 + (2.2w + 1.4w)$

$7.2 + (2.2w + 1.4w) = 7.2 + 3.6w = 3.6(2 + w)$

A student who selects this response may have limited understanding of how to apply properties of operations to add, subtract, and factor linear expressions with rational coefficients.

Answer choices A, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when applying properties of operations to add, subtract, and factor linear expressions with rational coefficients.

A storeowner made a list of the number of greeting cards sold last month. The store sold 167 thank-you cards, 285 birthday cards, and 56 blank cards. Based on these data, which number is closest to the probability that the next customer will buy a blank card?

A   0.11

B   0.33

C   0.56

D   0.89

Key: A
Measured CCLS: 7.SP.6

Commentary: This question measures 7.SP.6 because it assesses the student's ability to approximate the probability of a chance event by using data on the chance process that produces it and observing its long-run relative frequency. In this case the student must use data about numbers of different card types (thank-you, birthday, and blank) sold last month to approximate the probability that a customer will choose a blank card.

Extended Rationale

Answer Choice A: "0.11"; This response represents the correct probability that the next customer will buy a blank card. The student may have added all of the cards sold in the last month and then divided the number of blank cards sold by the total to calculate the probability.

$167 + 285 + 56 = 508$

$$\frac{56}{508} \simeq 0.11$$

A student who selects this response has an understanding of how to approximate the probability of a chance event.

Answer Choice B: "0.33"; This response is incorrect and may occur when the student adds all of the cards sold in the last month and then divides the number of thank-you cards sold by the total.

$167 + 285 + 56 = 508$

$$\frac{167}{508} \simeq 0.33$$

A student who selects this response may have a limited understanding of how to approximate the probability of a chance event.

Answer Choice C: "0.56"; This response is incorrect and may occur when the student adds all of the cards sold in the last month and then divides the number of birthday cards sold by the total.

$167 + 285 + 56 = 508$

$$\frac{285}{508} \simeq 0.56$$

A student who selects this response may have a limited understanding of how to approximate the probability of a chance event.

Answer Choice D: "0.89"; This response is incorrect and may occur when the student adds all of the cards sold in the last month and then divides the number of birthday cards and thank-you cards sold by the total.

$167 + 285 + 56 = 508$

$$\frac{452}{508} \simeq 0.89$$

A student who selects this response may have a limited understanding of how to approximate the probability of a chance event.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors made when approximating the probability of a chance event using data on the chance process that produces it and observing its long-run relative frequency.

Bananas cost $0.45 per pound. What equation is used to find C, the total cost of p pounds of bananas?

A $C = 0.45p$

B $C = p + 0.45$

C $0.45C = p$

D $0.45 + C = p$

Key: A
Measured CCLS: 7.RP.2c

Commentary: This question measures 7.RP.2c because it assesses the student's ability to represent a proportional relationship by an equation.

Extended Rationale

Answer Choice A: "$C = 0.45p$"; This answer represents the correct equation used to find C, the total cost of p pounds of bananas. The student may have recognized that the unit price of $0.45 per pound, was the constant of proportionality, and that the number of pounds of bananas, p, was the independent variable. A student who selects this response understands how to represent proportional relationships by equations.

Answer Choice B: "$C = p + 0.45$"; This response is incorrect and may occur if a student assumes that addition should be used in the equation, since each pound adds $0.45 to the cost. A student who selects this response may have limited understanding of how to represent proportional relationships by equations.

Answer Choice C: "$0.45C = p$"; This response is incorrect and may occur if a student reverses the variables used to represent the cost and the number of pounds of bananas. A student who selects this response may have limited understanding of how to represent proportional relationships by equations.

Answer Choice D: "$0.45 + C = p$"; This response is incorrect and may occur if a student assumes that addition should be used in the equation, since each pound adds $0.45 to the cost, and also misinterprets C as the independent variable. A student who selects this response may have limited understanding of how to represent proportional relationships by equations.

Answer choices B, C, and D are plausible but incorrect. They represent common student errors and misconceptions made when representing proportional relationships by equations.

A store purchased a DVD for $12.00 and sold it to a customer for 50% more than the purchase price. The customer was charged a 7% tax when the DVD was sold. What was the customer's total cost for the DVD?

A $12.84

B $18.42

C $18.84

D $19.26

Key: D
Measured CCLS: 7.RP.3

Commentary: This question measures 7.RP.3 because it assesses the student's ability to interpret and use proportional relationships to solve a multistep percent problem.

Extended Rationale

Answer Choice A: "$12.84"; This response is incorrect and may occur if a student finds the total cost of $12.00 plus 7% sales tax.

$12.00 \times (1 + 0.07) = $12.84

A student who selects this response may have limited understanding of how to interpret and use proportional relationships to solve multistep percent problems.

Answer Choice B: "$18.42"; This response is incorrect and may occur if a student includes the 7% sales tax on the 50% increase only and then adds the result to the original $12.00.

$12.00 \times 0.5 = $6.00
$6.00 \times (1 + 0.07) = $6.42
$12.00 + $6.42 = $18.42

A student who selects this response may have limited understanding of how to interpret and use proportional relationships to solve multistep percent problems.

Answer Choice C: "$18.84"; This response is incorrect and may occur if a student applies both percents as an increase on the original $12.00.

$12.00 \times (1 + 0.5 + 0.07) = $18.84

A student who selects this response may have limited understanding of how to interpret and use proportional relationships to solve multistep percent problems.

Answer Choice D: "$19.26"; This response represents the correct total cost of the DVD. The student may have used a method such as one of those below.

Method 1: $12.00 \times 0.5 = $6.00
($12.00 + $6.00) \times 0.07 = $1.26
$18.00 + $1.26 = $19.26

Method 2:
$$\$12.00 \times (1 + 0.5) = \$18.00$$
$$\$18.00 \times (1 + 0.07) = \$19.26$$

A student who selects this response understands how to interpret and use proportional relationships to solve multistep ratio and percent problems.

Answer choices A, B, and C are plausible but incorrect. They represent common student errors and misconceptions made when interpreting and using proportional relationships to solve multistep ratio and percent problems.

To select a new school mascot, 20 randomly selected students in each grade were asked to choose between the two finalists: tiger and eagle. The results are shown below.

PREFERRED MASCOT

Grade	Tiger	Eagle
5	14	6
6	13	7
7	8	12
8	5	15

Which statement is **best** supported by the results?

A The preferred mascot is a tiger.

B The preferred mascot is an eagle.

C Fifth and sixth grade students at the school preferred an eagle mascot.

D Seventh and eighth grade students at the school preferred an eagle mascot.

Key: D
Measured CCLS: 7.SP.2

Commentary: This question measures 7.SP.2 because it assesses the student's ability to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Extended Rationale

Answer Choice A: "The preferred mascot is a tiger." This response is incorrect and may occur if a student only considers the data in the top two rows, where the greatest number of votes in both grades 5 and 6 was for the tiger mascot. A student who selects this response may have limited understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer Choice B: "The preferred mascot is an eagle." This response is incorrect and may occur if a student only considers the data in the bottom two rows, where the greatest number of votes in both grades 7 and 8 was for the eagle mascot. A student who selects this response may have limited understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer Choice C: "Fifth and sixth grade students at the school preferred an eagle mascot." This response is incorrect and may occur if a student makes an error when interpreting the data in the top two rows, where the greatest number of votes in both grades 5 and 6 was for the tigers. A student who selects this response may have limited understanding of how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer Choice D: "Seventh and eighth grade students at the school preferred an eagle mascot." This statement is best supported by the given data. The student may have observed that the greatest number of votes in both grades 7 and 8 was for the eagle mascot. A student who selects this response understands how to use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Answer choices A, B, and C are plausible but incorrect. They represent common student errors and misconceptions made when using data from a random sample to draw inferences about a population with an unknown characteristic of interest.

Graham's monthly bank statement showed the following deposits and withdrawals:

$$-\$25.20, \ \$52.75, \ -\$22.04, \ -\$8.50, \ \$94.11$$

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

Answer $_____

Measured CCLS: 7.NS.1d

Commentary: This question measures 7.NS.1d because it assesses a student's ability to add and subtract rational numbers.

Extended Rationale: This question asks students to calculate Graham's account balance at the end of the month when given the starting account balance and a series of deposits and withdrawals. Students must include computations that will lead to a correct response. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate a thorough understanding of applying properties of operations as strategies to add and subtract rational numbers. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct response.

The correct balance, in dollars, requires adding and/or subtracting a series of rational numbers that represent deposits and withdrawals. The answer may be determined by writing a variety of equivalent expressions and then performing the operations shown. These are some examples:

$47.86 + (-25.20) + 52.75 + (-22.04) + (-8.50) + 94.11$

$47.86 - 25.20 + 52.75 - 22.04 - 8.50 + 94.11$

Performing these operations results in the correct answer, $138.98.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

47.86−26.20 + 52.75 − 22.04 − 8.50 + 94.11
22.66 + 52.75 − 22.04 − 8.50 + 94.11
75.41 − 22.04 − 8.50 + 94.11
53.37 − 8.50 + 94.11
44.87 + 94.11
$138.98

Answer $ 138.98

47.86
−25.20
22.66
+ 52.75
75.41

53.37
−8.50
44.87
+ 94.11
138.98

75.41
−22.04
53.37

Score Point 2 (out of 2 points)

This response includes the correct solution ($138.98) and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Each step in the process is shown and the final solution is correct.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

$$\begin{array}{r} 47.86 \\ -\ 25.20 \\ \hline 22.66 \end{array}$$

$$\begin{array}{r} 22.66 \\ +\ 52.75 \\ \hline 75.41 \end{array}$$

$$\begin{array}{r} 75.41 \\ -\ 22.04 \\ \hline 53.37 \end{array}$$

$$\begin{array}{r} 53.37 \\ -\ 8.50 \\ \hline 44.87 \end{array}$$

$$\begin{array}{r} 44.87 \\ +\ 94.11 \\ \hline 138.98 \end{array}$$

Answer $ 138.98

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Each step is completed individually, using the value determined in the previous step. This is an appropriate mathematical process and the final solution is correct.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

$$47.86 - 25.20 + 52.75$$
$$- 22.04 - 8.50 + 94.11$$
$$= 138.98$$

Answer $ 138.98

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. An equation indicating each operation is shown for the work. While no intermediate steps or values are shown, none are needed due to the use of calculators at this grade level, and the correct final solution is provided.

Graham's monthly bank statement showed the following deposits and withdrawals:

W D   W D   W   W   D
−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month,
what was the account balance at the end of the month?

Show your work.

$$\boxed{-25.20} + \boxed{52.75} + \boxed{-22.04} + \boxed{-8.50} + \boxed{94.11} + \boxed{47.86}$$

$$\begin{array}{r} 94.11 \\ +\ 52.75 \\ \hline 146.86 \end{array}$$

Added − 146.84

had − 47.86

took out − 55.74

$$\begin{array}{r} \$146.84 \\ -\ 55.74 \\ \hline 91.10 \end{array}$$

$$\begin{array}{r} -25.20 \\ -22.04 \\ -\ 8.50 \\ \hline -55.74 \end{array}$$

$$\begin{array}{r} 91.10 \\ +47.86 \\ \hline 138.96 \end{array}$$

Answer $ __138.96__

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. An expression is set up correctly but is not used to determine the solution. Instead, the deposits and withdrawals are totaled, the sums are added together, and then the initial balance is added to the result. However, a transcription error is made partway through the problem; the sum of the deposits is correctly determined (146.86), but then it is written as 146.84 for the next step in the process. Therefore, this response contains an incorrect solution, but applies a mathematically appropriate process.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

```
  47.86        22.66        75.41      73.37   +64.87
− 25.20       +52.75      − 22.04       8.50     94.11
  22.66        75.41        73.37      64.87  $253.08
```

Answer $ _253.08_

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. Starting with the initial balance, each individual deposit or withdrawal is added to the previous balance. While this is a mathematically appropriate process, two calculation errors are made (75.41 – 22.04 = 53.37, not 73.37, and 64.87 + 94.11 = 158.98, not 253.08), resulting in an incorrect solution.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

```
  −25.20          −22.04
 +52.75           − 8.50
  27.55          ±−30.54


  −30.54          + 94.11
 +27.55           − 2.99
  −2.99            41.12
```

Answer $ 91.12

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The deposits and withdrawals are added together, resulting in a correct value of 91.12. However, the initial balance is not included in the work. This response correctly addresses some elements of the task.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

$$-25.20$$
$$-22.04$$
$$+8.50$$
$$\overline{55.75}$$

$$52.75$$
$$+94.11$$
$$\overline{166.86}$$

Answer $ 15497

Score Point 0 (out of 2 points)

This response is incorrect. The withdrawals are added incorrectly (−25.20 + −22.04 + −8.50 = −55.74, not 55.75). The deposits are also added incorrectly (52.75 + 94.11 = 146.86, not 166.86). Additionally, the initial balance is not included. Although there are some correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

Graham's monthly bank statement showed the following deposits and withdrawals:

−$25.20, $52.75, −$22.04, −$8.50, $94.11

If Graham's balance in the account was $47.86 at the beginning of the month, what was the account balance at the end of the month?

Show your work.

138.98

Answer $ 138.98

Score Point 0 (out of 2 points)

Although this response contains a correct solution, without any work, this alone is not sufficient to demonstrate even a limited understanding.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

Answer $_____

Measured CCLS: 7.RP.3

Commentary: This question measures 7.RP.3 because it assesses using proportional relationships to solve a multi-step percent problem.

Extended Rationale: This question asks students to determine the selling price, in dollars, of one camera Kelsie sells, given the purchase price of $65 and the markup of 60%. Students must include computation(s) that will lead to a correct response, where work is provided to defend each step in the process. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate a thorough understanding of using proportional relationships to solve multi-step ratio and percent problems. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct solution.

The problem is considered "multi-step" because it involves not only finding 60 percent of 65 dollars, but also adding this amount (the "markup") to 65, to find the selling price. The student could have determined 60% of 65 using the fact that $60\% = 0.60,$ then added the result to 65:

$65 \times 0.60 = 39.00$

$65 + 39 = 104.00$

The student could also have used an equation to determine the markup, using the fact that $60\% = \dfrac{60}{100}$, then added the result to 65:

$\dfrac{x}{65} = \dfrac{60}{100}$, where x is the markup.

$100x = 60(65)$

$x = \dfrac{3900}{100}$

$x = 39.00$

$65 + 39 = 104.00$

Finally, another approach could be to recognize that adding 60% of 65 to 65 is equivalent to determining 160% of 65:

$100\% + 60\% = 160\%$ or 1.6

$65 \times 1.6 = 104$

All of these approaches to this multi-step percent problem result in the correct response of 104.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$$65 \times .60$$
$$39$$

$$65$$
$$+39$$
$$\overline{104}$$

Answer $ __104__

Score Point 2 (out of 2 points)

This response includes the correct solution ($104) and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The markup is correctly calculated and then added to the original price, resulting in the correct selling price for the camera.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$$\frac{160\%}{100} \underset{\times}{\times} \frac{x}{65} \text{ orignal}$$
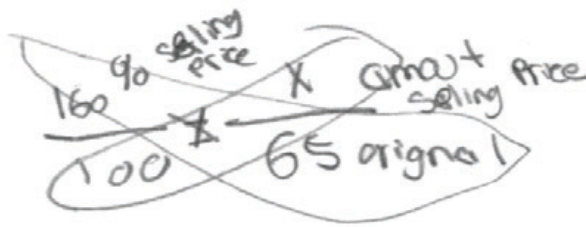
$$\frac{100x}{100} = \frac{10400}{100}$$

$$x = 104$$

Answer $ 104

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. A proportion is used to calculate 160% of the original price of the camera, 100% of the original cost plus the 60% markup, resulting in the correct selling price.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$10\%\ of\ 65 = 6.5$

$$\begin{array}{r} 65 \\ +39 \\ \hline 104 \end{array}$$

$$\begin{array}{r} 6.5 \\ \times\ 6 \\ \hline 39 \end{array}$$

$\$104\ each$

Answer $ ___104 each___

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. In this response, 10% of the original cost is determined (6.5). This is then multiplied by 6 to determine 60% of the original price, the total markup. The original price and markup are added, resulting in the correct selling price.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$65 each

60% markup

65
x .60
─────
39.0

Answer $39.00

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The response shows the correct calculation of the markup; however, this is then given as the selling price of the camera, which is incorrect.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$$\frac{is}{of} = \frac{\%}{100}$$

$$\frac{x}{65} \bcancel{=} \frac{60}{100}$$

$$60 \cdot 65 = 100x$$
$$\frac{3900}{100} = \frac{100x}{100}$$
$$\boxed{39 = x}$$

Answer $ 39.00

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. A correct proportion is used to determine the markup. The markup is then given as the final solution, which is incorrect.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$$
\begin{array}{r}
\overset{3}{6}5 \\
\times\ .60 \\
\hline
39.00
\end{array}
\qquad
\begin{array}{r}
\overset{5}{6}5 \\
-39 \\
\hline
26
\end{array}
$$

Answer $ 26

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. While the markup is determined correctly (65 × .60), it is then inappropriately subtracted from the original price, resulting in an incorrect value for the selling price of the camera.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$$\frac{60}{100} = \frac{65}{x}$$

$$\frac{60x}{60} = \frac{65(100)}{60}$$

$$\frac{6500}{60}$$

$$108.33$$

Answer $ __108.33__

Score Point 0 (out of 2 points)

This response is incorrect. The proportion shown is set up incorrectly and, while the calculation is done correctly, the solution is incorrect. Holistically, correct computations alone are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

Kelsie sold digital cameras on her web site. She bought the cameras for $65 each and included a 60% markup to get the selling price. To the nearest dollar, what was the selling price for one camera?

Show your work.

$$\begin{array}{r} 65 \\ +60 \\ \hline 125 \end{array}$$

Answer $ 125

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

Answer _____ square inches

74

Measured CCLS: 7.G.4

Commentary: This question measures 7.G.4 because it assesses a student's knowledge of and ability to use the formulas for the area and circumference of a circle to solve problems.

Extended Rationale: This question asks students to determine the area in terms of π, in square inches, of a circle given the circumference, in inches, of this circle. Students must include a set of computations that will lead to a correct response, where work is provided to defend each step in the process. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate knowledge of the formulas for the area and circumference of a circle and a thorough understanding of how to use them to solve problems. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct response.

The correct area, in square inches, of a circle may be arrived at by applying the formulas for circumference and area of a circle:

$$C = 2\pi r$$

$$11\pi = 2\pi r$$

$$A = \pi r^2$$

$$\frac{11\pi}{2\pi} = \frac{2\pi r}{2\pi}$$

$$A = \pi(5.5)^2$$

$$5.5 = r$$

$$A = 30.25\pi$$

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$C = 2\pi r$

$11/2 = 5.5$

5.5π

5.5

$C = 11\pi$ in

$A = \pi r^2$

$r = 5.5$

$A = \pi(5.5^2) in^2$

$A = \pi(30.25) in^2$

$A = 30.25\pi \ in^2$

Answer ___30.25π___ square inches

Score Point 2 (out of 2 points)

This response includes the correct solution (30.25π) and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Mathematically sound procedures are used to determine the radius ($C = 2\pi r$, $11/2 = 5.5$) and the area ($A = \pi(5.5^2)$, $A = \pi(30.25)$).

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$d = 11$

$r = 5\frac{1}{2}$

$A = \pi r^2$

$A = \pi \cdot 5\frac{1}{2}^2$

$A = \frac{11}{2} \cdot \frac{11}{2} (\pi)$

$A = \frac{121}{4} = 30\frac{1}{4}\pi$

$A = 30\frac{1}{4}\pi \, in^2$

Answer _____ square inches

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The equations showing "d = 11" and "r = 5½" are sufficient for the required work to determine the radius. A mathematically sound procedure is used to calculate the area of the circle and the final solution is correct.

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$C = \pi d$

$\dfrac{11\pi}{\pi} = \dfrac{\pi d}{\pi}$

$\underline{11 = d}$

$11 \div 2 = 5.5$

$r = 5.5$

$A = \pi \cdot r \cdot r$

$A = \pi \cdot 5.5 \cdot 5.5$

$\boxed{A = 30.25\pi \text{ in}^2}$

Answer ___30.25___ square inches

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. Mathematically sound procedures are used to determine the radius (11 ÷ 2 = 5.5) and the area ($A = \pi \cdot 5.5 \cdot 5.5$, $A = 30.25\pi\text{in}^2$). The correct solution is circled. The π is not included when the solution is transferred to the answer space, but this transcription error does not detract from the demonstration of a thorough understanding.

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$C = \pi d$

$A = \pi r^2$

$d = 11$

$r = 5.5$

$\pi 30.25$

$r^2 = 30.25$

Answer ___95___ square inches

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The work to determine the radius is shown (d = 11; r = 5.5). The area is correctly calculated; however, the solution provided is not expressed in terms of pi.

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$C = \pi d$

$d = 11$

$r = 5.5$

$\begin{array}{r} 5.5 \\ 2\overline{)11.0} \\ \underline{10} \downarrow \\ 10 \\ \underline{10} \\ 0 \end{array}$

$A = \pi r^2$

$A = \pi \cdot 5.5^2$

$A = 30.25 \text{ in}^2$

Answer ___30.25___ square inches

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. Mathematically appropriate processes are used to determine the radius ($C = \pi d$, $d = 11$, $2\overline{)11.0}$ with quotient 5.5) and the area ($A = \pi r^2$, $A = \pi \cdot 5.5^2$); however, the solution ($A = 30.25 \text{ in}^2$) is incorrect.

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$A = \pi r^2$

$A = \pi (11)^2$

$A = \pi (121)$

$A = 121\pi \ in^2$

$C = 11\pi \rightarrow d = 11 \ inch$

$C = \pi d$

Answer ___121π___ square inches

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The response uses the circumference – diameter relationship to determine the value of the diameter; however, the diameter instead of the radius is used to calculate the area.

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$A = \pi r^2$

$A = \pi\, 2.75^2$

$A = 7.5625\pi$ inches

$$2\overline{)11} = 5.5$$

$$2\overline{)5.5} = 2.75$$

Answer ___7.5625 π___ square inches

Score Point 0 (out of 2 points)

This response is incorrect. The diameter is divided by 2 and then this value is again divided by two. This value is then used for the radius. Although some correct mathematical procedures are used, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

The circumference of a circle is 11π inches.

What is the area, in square inches, of the circle? Express your answer in terms of π.

Show your work.

$$C = \pi d$$
$$C = \pi (11)$$
$$C = 34.6$$

Answer __34.6__ square inches

Score Point 0 (out of 2 points)

This response is incorrect. The diameter is multiplied by π and this is given as the answer.

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

Answer _____

Measured 7.NS.2d

Commentary: This question measures 7.NS.2d because it assesses a student's ability to convert a rational number to a decimal using long division.

Extended Rationale: This question asks students to convert $\frac{3}{11}$ to the decimal equivalent. Students must include a set of computations that will lead to a correct response where work is provided to defend each step in the process. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate a thorough understanding of converting a rational number to a decimal using long division, and knowing that the decimal form of a rational number terminates in 0s or eventually repeats. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct response.

The correct decimal equivalent of $\frac{3}{11}$ may be arrived at using the traditional long division algorithm:

```
        0.2727
11) 3.0000
    −22
       80
      −77
        30
       −22
         80
        −77
          3
```

Once it is recognized that the decimal repeats, the decimal can be written as $0.\overline{27}$.

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$.27272 = 7.\overline{27}$$

$$11\overline{)3.0000}$$
$$-2\ 2\downarrow$$
$$80$$
$$-77$$
$$30$$
$$-22$$
$$80$$
$$-77$$
$$30$$
$$-22$$
$$8$$

Answer $0.\overline{27}$

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The long division is completed correctly and the solution is appropriately written, indicating the repeating nature of the decimal.

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$.\overline{27}$$

$$3 \quad .\overline{272}$$
$$11\overline{)3.0000}$$
$$\underline{-22}\downarrow$$
$$80$$
$$\underline{-77}\downarrow$$
$$30$$
$$22$$

Answer $.\overline{27}$

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The long division is completed correctly and the solution is appropriately written, indicating the repeating nature of the decimal.

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$
\begin{array}{r}
.2727 \\
11\overline{\smash{)}3.1000} \\
-22 \\
\hline
80 \\
-77 \\
\hline
30 \\
-22 \\
\hline
80 \\
\end{array}
$$

Answer _____ $.27\overline{27}$

Score Point 2 (out of 2 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The long division is completed correctly. The solution, while not written in the conventionally acceptable manner, is equivalent to the correct answer, and is therefore acceptable.

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$\begin{array}{r} .2727 \\ 11\overline{\smash{)}3.0000} \\ -22 \\ \hline 80 \\ -77 \\ \hline 30 \\ -22 \\ \hline 80 \\ -77 \\ \hline 3 \end{array}$$

Answer _____ .27 _____

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The long division is completed correctly; however, the solution is written incorrectly (.27).

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$0.272727273$$
$$11 \overline{)3.006000}$$
$$-22$$
$$80$$
$$-77$$
$$36$$
$$-22$$
$$80$$
$$-77$$
$$30$$
$$-22$$
$$80$$
$$-77$$
$$3$$

Answer 0.272727273

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The long division is completed correctly; however, the solution is written incorrectly ($0.27272727\overline{3}$).

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$0.272727272$$

$$11\overline{)3.000000000}$$

```
  0
  30
 -22
  780
  -77
   30
  -22
   80
  -77
   30
  -22
   80
  -77
   30
  -22
   80
  -77
   30
```

Answer $0.2\overline{7}$

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The long division is completed correctly; however, the solution is written incorrectly ($0.2\overline{7}$).

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$
\begin{array}{r}
0.27 \\
11\overline{)3.00} \\
\underline{6} \\
21 \\
\underline{21} \\
6
\end{array}
$$

Answer __0.27__

Score Point 0 (out of 2 points)

This response contains a correct solution using an obviously incorrect procedure. The long division is clearly incorrect. Calculators are available to students at this grade level; there is no credit for the correct solution without the necessary long division being shown.

Convert $\frac{3}{11}$ to a decimal equivalent using long division.

Show your work.

$$\frac{3}{11}$$

$$3\overline{)9+''} = \boxed{3.\overline{667}}$$
$$\underline{-9}$$
$$\overline{02}$$
$$\underline{-1}$$
$$\overline{01}$$
$$\underline{-1}$$
$$\overline{00}$$

Answer $3.\overline{67}$

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

Answer $ _____

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were **deducted**. What was the amount that Ms. Donaldson received?

Show your work.

Answer $ _____

Measured CCLS: 7.EE.3

Commentary: This question measures 7.EE.3 because it assesses a student's ability to solve multi-step real-life problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), applying properties of operations to calculate with numbers in any form, and converting between forms as appropriate.

Extended Rationale: This question asks students to determine the amount of money earned, given the hourly rate, overtime amount, and the number of hours worked. Then, students must determine the net amount after insurance and payroll deductions. Students must include a set of computations that will lead to a correct response, where work is provided to defend each step in the process. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate a thorough understanding of solving multi-step real-life problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), applying properties of operations to calculate with numbers in any form, and converting between forms as appropriate. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct response.

The correct amount of money earned by this person may be determined by first multiplying to determine the total money earned for the first 40 hours:

$\$18.80 \times 40 = \$752.00$

The number of hours beyond the first 40 can be determined by subtracting. Multiplying this extra amount by $1\frac{1}{2}$ times the hourly wage, then adding to the amount earned from the first 40 hours, yield the total amount earned.

$\left(\$18.80 \times 1\frac{1}{2}\right) \times (45.5 - 40) = \$155.10$

$\$752.00 + \$155.10 = \$907.10$

The correct net amount of money after deductions may be determined by first subtracting the health insurance payment, then multiplying by $(1 - 0.28)$, which represents a deduction of 28%:

$\$907.10 - \$34.55 = \$872.55$

$\$872.55 \times (1 - 0.28) \approx \$628.24$

earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

$$40 \times 18.80 = 752$$
$$5.5 \times 1.5 (18.80) = 155.10$$

$$\begin{array}{r} ^{1}752.00 \\ + 155.10 \\ \hline 907.10 \end{array}$$

Answer $ __907.10__

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were **deducted**. What was the amount that Ms. Donaldson received?

Show your work.

Let D = what Ms. Donaldson recieves after deductions

$$\frac{72}{100} = \frac{d}{872.55}$$

$$\begin{array}{r} 907.10 \\ - 34.55 \\ \hline 872.55 \end{array}$$

$$100d = 62823.6$$
$$d = 628.236 \qquad d \approx 628.24$$

Answer $ __628.24__

Score Point 3 (out of 3 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. In the first part, the wages for regular hours and overtime hours are calculated and then added to obtain the correct total wages. In the second part, the insurance payment is subtracted and 72% of the remaining value is calculated, resulting in the correct amount received.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

18.80 = 1h
$752.00 $18.80×40=752
$752.00 $18.80×1.5=28.20
$55.10
907.10 $155.10 = 5.5 overtime

Answer $ __$907.10 = 45.5h__

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were **deducted**. What was the amount that Ms. Donaldson received?

Show your work.

34.55 $907.10
   -34.55   28% = 244.31
   872.55
  - 244.31
   628.24

Answer $ __$628.24__

Score Point 3 (out of 3 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. In the first part, the regular wages are determined, the hourly rate for overtime is calculated, and this is used to determine the overtime wages. The wages are added to determine the correct total earnings. In the second part, the insurance payment is deducted from the wages determined earlier and then 28% of the remaining amount is calculated. This is subtracted to determine the correct amount received.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

```
  752        18.80       18.80       28.20
+ 155.1     X40.00      X 1.50      X5.50
 907.1      752.00       28.20      155.10
```

Answer $ _____907.1_____

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were deducted. What was the amount that Ms. Donaldson received?

Show your work.

```
  907.1        872.55X0.28 = 244.31
-  34.55            6 2
  872.55         872.55
              -  244.31
                628.24
```

Answer $ _____628.24_____

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

```
  18.80           18.80          5.5              45.5
x    40          x  1.5        x 28.20          - 40.0
  752             28.20         166.10             5.5

                                 752
                               + 155
                                 907
```

Answer $ ___907.00___

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were **deducted**. What was the amount that Ms. Donaldson received?

Show your work.

```
  907.00         872.49 x .28 = 244.286
- 34.55
  872.45          872.45
                - 244.29
                  628.16
```

Answer $ ___628.16___

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. In the first part, the regular wages are determined, the hourly rate for overtime is calculated, and this is used to determine the overtime wages. The wages are added to determine the total earnings, but the overtime wages are rounded to the nearest dollar, which results in an incorrect value for the total earnings. In the second part, the insurance payment is deducted from the wages determined earlier and then 28% of the remaining amount is calculated. This is subtracted to determine the amount received and is correct based upon the incorrect answer in the first part.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

$1\frac{1}{2} = 1.5$

$18.80(1.5) = 28.20$

28.20
5

14.16

$141.00
+ 14.10
155.10
752.00
907.10

Answer $ _907.10_

A health insurance payment of $34.55 was deducted from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were deducted. What was the amount that Ms. Donaldson received?

Show your work.

907.10
- 3455
872.55

$\frac{28}{100} = \frac{x}{872.55}$

$100x = 872.55(28)$

Answer $ _244.31_

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

$$28.20 \times 5.50 = 155.1$$

$$40 \times 18.80 = 752$$

$$18.80 \times 1.50 = 28.20$$

$$752.00 + 155.10 = 907.10$$

Answer $ __907.10__

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were **deducted**. What was the amount that Ms. Donaldson received?

Show your work.

$$907.10 - 34.55 = 872.55$$

$$28\overline{)872.55} = 31.1625$$

$$872.55 - 31.16 = 841.39$$

Answer $ __841.39__

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. In the first part, the regular wages are determined, the hourly rate for overtime is calculated, and this is used to determine the overtime wages. The wages are added to determine the correct total earnings. In the second part, the insurance payment is deducted from the wages determined earlier. The remaining wages are divided by 28, rather than multiplied by 0.28. This incorrect result is correctly subtracted from the amount earned determined in the first part.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

$$
\begin{array}{r}
3\,18.80 \\
\times \quad 40 \\
\hline
0000 \\
75200 \\
\hline
752.00
\end{array}
$$

$$
\begin{array}{r}
752 \\
+330 \\
\hline
1082
\end{array}
$$

$$
\begin{array}{r}
40 \\
\times 1.5 \\
\hline
200 \\
+400 \\
\hline
60.0
\end{array}
$$

$$
\begin{array}{r}
60 \\
\times 5.5 \\
\hline
300 \\
+3000 \\
\hline
330.0
\end{array}
$$

Answer $ $1082

A health insurance payment of $34.55 was deducted from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were deducted. What was the amount that Ms. Donaldson received?

Show your work.

$$
\begin{array}{r}
7\,11\,9 \\
1082.00 \\
- \quad 34.55 \\
\hline
1047.15 \\
- \quad 293.29 \\
\hline
754.16
\end{array}
$$

$$
\frac{28}{100} = 1047.45
$$

$$
\frac{100x}{100} = \frac{29328.6}{100}
$$

$$
x = 293.286 = 293
$$

Answer $ $754.16

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. In the first part, the regular wages are correctly calculated. However the overtime amount is incorrectly determined; instead of multiplying 1.5 by $18.80, 1.5 is multiplied by 40. The product of 1.5 and 40 is then multiplied by the hours over 40, 5.5. This value ($1082) is then used correctly in the second part to determine the amount that would be received.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

```
  3 3
  1 8 8 0
  x  4 0
  7 5 2 . 0 0
```

```
  1
  7 5 2 . 0 0
  1 4 1 . 0 0
+   1 4 . 1 0
  9 0 7 . 1 0
```

```
  4  4
  1 8 . 8 0
  x  1 . 1 . 5
  1 9 4  0 0
+ 1 8 8 0 0
  2 8 . 2 0 0
```

```
  4    ·
  2 8 . 2 0
  x    1 5
  1 4 1 . 0 0

  4
  1 8 . 8 0
  x  7 . 5
  1 4 . 0 0
```

Answer $ ____907.10____

A health insurance payment of $34.55 was deducted from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were deducted. What was the amount that Ms. Donaldson received?

Show your work.

```
  3 4 4
  3 4 . 5 5
  x    . 2 8
  2 7 6 4 0
```

```
  3 1 4
  3 4 . 5 5
  - 2 . 7 6
  3 1 . 7 9
```

Answer $ ____31.79____

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. In the first part, the total earnings are correctly determined. However, in the second part, 28% of the health insurance is incorrectly calculated and subtracted from the total health insurance. This difference is provided as the solution and is incorrect.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

18.80 · 40 = $752 · 1.5 = 1128 · 1.5 = 1692 = 2538

Answer $ __2538.00__

A health insurance payment of $34.55 was deducted from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were deducted. What was the amount that Ms. Donaldson received?

Show your work.

2538.00 − 34.55 = 2503.45 · .28 =
700.97

Answer $ __700.97__

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. In the first part, the regular wages are correctly calculated, but an error is made when trying to determine the overtime wages, resulting in incorrect total earnings. In the second part, the insurance payment is deducted from the incorrect wages determined earlier and then 28% of the remaining amount is calculated. The calculated payroll tax is entered as the solution in the second part.

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

$$752$$
$$1\ 55.1$$
$$+\ \overline{}$$
$$907.1$$

Answer $ __907.1__

A health insurance payment of $34.55 was **deducted** from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were **deducted**. What was the amount that Ms. Donaldson received?

Show your work.

Answer $ __24.87__

<div style="border:1px solid black; padding:10px;">

Score Point 0 (out of 3 points)

This response is incorrect. Although the answer given to the first part is correct, the supporting work is insufficient. The second part has no work and an incorrect answer. Holistically, this is not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

</div>

Ms. Donaldson earns $18.80 per hour for the first 40 hours she works in a week. She earns $1\frac{1}{2}$ times that amount per hour for each hour beyond 40 hours in a week. Last week Ms. Donaldson worked 45.5 hours. How much money did she earn?

Show your work.

$18.80 \times 40 = \boxed{752}$

$18.80 \times 1.5 = 24.75$ $5 \times 27.75 =$

$27.75 \div 2 = 13.875$ $\boxed{138.75}$

$\boxed{13.88}$

Answer $ __904.63__

$\begin{array}{r} 752 \\ + 138.75 \\ 13.88 \\ \hline 904.63 \end{array}$

A health insurance payment of $34.55 was deducted from Ms. Donaldson's earnings for the week. After the insurance deduction, payroll taxes equal to 28% of the balance were deducted. What was the amount that Ms. Donaldson received?

Show your work.

$\begin{array}{r} 904.63 \\ - 34.55 \\ \hline 870.08 \end{array}$ 870.08

$28 \div 870.08 \times 100 = 3.218$

3.22

$\begin{array}{r} 870.08 \\ - 3.22 \\ \hline 860.86 \end{array}$

Answer $ __866.86__

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

Answer _____%

Measured CCLS: 7.RP.3

Commentary: This question measures 7.RP.3 because it assesses a student's ability to use proportional relationships to solve multistep ratio and percent problems.

Extended Rationale: This question asks students to determine the percentage of a real estate agency's fee that a certain real estate agent received as commission for selling a house. Students must include a set of computations that will lead to a correct response, where work is provided to defend each step in the process. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate a thorough understanding of using proportional relationships to solve multistep ratio and percent problems. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct response.

The correct total percentage of a real estate agency's fee that the real estate agent received as commission for selling a house may be arrived at by first determining 4% of $175,000, then determining what percent of this is represented by $4,725. One possible method involves computations with fractions and decimals:

$$\$175,000 \times 04 = \$7,000$$

$$\frac{\$4,725}{\$7,000} \times 100 = 67.5\%$$

Another possible method emphasizes solving equations:

$$\frac{x}{\$175,000} = \frac{4}{100} \qquad\qquad \frac{\$4,725}{\$7,000} = \frac{x}{100}$$

$$100x = \$700,000 \qquad\qquad \$7,000x = \$472,500$$

$$x = \$7,000 \qquad\qquad\qquad x = 67.5\%$$

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$175,000 \times .04 = 7000$$

$$44725 \div 7000 = 0.675$$

Answer __67.5__ %

Score Point 3 (out of 3 points)

This response includes the correct solution (67.5) and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The response uses mathematically sound procedures to first determine the agency's fee (175,000 × .04 = 7000) and then Mrs. Hamilton's percent (4725 ÷ 7000 = 0.675).

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$175\,000 \cdot .04$$

$$\frac{4725}{7000} = \frac{x}{100}$$

$$7000x = \frac{472500}{7000}$$

$$x = 67.5$$

Answer 675 %

Score Point 3 (out of 3 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The response indicates 4% of 175,000 is 7,000 and uses a mathematically sound procedure to determine the solution ($4725/7000 = x/100$, $7000x = 472500$, $x = 67.5$)

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$\$175,000.00$$
$$\times \quad .04$$
$$\overline{7,000.0000}$$

7,000

4,725

$$7000$$
$$\times \quad .675$$
$$\overline{4725}$$

Answer 67.5 %

Score Point 3 (out of 3 points)

This response includes the correct solution and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The response uses mathematically sound procedures to first determine the agency's fee ($175,000.00 × .04 = 7,000.0000) and demonstrates the solution (67.5) is Mrs. Hamilton's percent (.675 × 7000 = 4725).

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$175,000$$
$$\times \;.4$$
$$\overline{70,000}$$

$$\frac{4725}{70,000} = \frac{x}{100}$$

$$\frac{70,000\,x}{70,000} = \frac{472500}{70,000}$$

$$x = 6.75$$

Answer __6.8__ %

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The response contains an incorrect solution (6.8) but provides sound procedures (.4 × 175,000 = 70,000, $^{4725}/_{70,000} = {}^{x}/_{100}$, x = 6.75). Determining 40% of 175,000 instead of 4% results in an incorrect solution.

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

lower

Show your work.

$$\frac{X}{175,000} = \frac{4}{100}$$

$$\frac{100x}{100} = \frac{700000}{100}$$

$$x = 7000$$

$$\frac{4,725}{175,000} = \frac{X}{100}$$

$$\frac{175,000x}{175,000} = \frac{472,500}{175,00}$$

$$x = 2.7$$

Answer __2.7__%

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The response correctly determines 4% of 175,000 is 7,000. However, the percent that 4,725 is of 175,000 is determined (2.7) instead of the percent that 4,725 is of 7,000.

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$\frac{x}{175,000} = \frac{y}{100}$$

$$\frac{100 x}{100} = \frac{700,000}{100}$$

$$\boxed{x = 7,000}$$

$$7,000 - 4,725 = 2,275$$

$$\frac{2,275}{7,000} = \frac{x}{100}$$

$$\frac{7,000 x}{7,000} = \frac{227,500}{7,000}$$

$$x = 32.5$$

Answer 32.5 %

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The response correctly determines 4% of 175,000 is 7,000. However, the response then determines the percent the agency keeps instead of Mrs. Hamilton's percentage ($7,000 - 4,725 = 2,275$, $2,275/7,000 = x/100$, $x = 32.5$).

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

house = 175,000

4% = 4,725

$$175,000$$
$$\times .04$$
$$7,000$$
$$-4,725$$
$$2,275$$

$$76.9$$
$$2275 \overline{)178000}$$
$$-172900$$
$$7,100$$

Answer __77__ %

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. The response determines the agency's fee (.04 × 175,000 = 7,000). However, the solution and remaining procedures are incorrect.

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$175,000$$
$$X \qquad .04$$
$$\overline{4\,3{,}7\,5{,}0{,}0\,0}$$

$$437.50$$

$$43,750.00$$
$$\div \quad 4,725.00$$
$$\overline{\quad 9.259 }$$

Answer _9.3_ %

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. The response shows the correct procedure for determining the agency's fee (.04 × 175,000). However, the operation performed is incorrect as is the remaining procedure.

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$$\frac{4,725}{175000} = 0.027 = 2.7\%$$

Answer ___2.7___ %

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. The response correctly determines Mrs. Hamilton's commission rate based on the sale price ($4,725/175,000 = 0.027$).

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

$I = prt$
$I = (175,000)(4) = 700,000$

$$\frac{100x}{100} = \frac{18900}{100} = \boxed{189}$$

Answer __189__ %

Score Point 0 (out of 3 points)

Although the response accurately determines 4% of Mrs. Hamilton's commission, the operation is not relevant to the problem and is not sufficient to demonstrate even a limited understanding.

Mrs. Hamilton worked for a real estate agency. She sold a house for $175,000. The agency's fee for the sale was 4% of the sale price. Mrs. Hamilton received $4,725 of the agency's fee as her commission. What percent of the agency's fee did Mrs. Hamilton receive? Round your answer to the nearest tenth of a percent.

Show your work.

175,000 ÷ 4,725 > 37.0

Answer __37.0__ %

Score Point 0 (out of 3 points)

Although the response accurately divides 175,000 by 4,725, the operation is not relevant to the problem and is not sufficient to demonstrate even a limited understanding.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

Equation _____

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

Answer _____ bracelets

Measured CCLS: 7.EE.4a

Commentary: This question measures 7.EE.4a because it assesses solving a word problem leading to the equation of the form $px + q = r$, where p, q, and r are specific rational numbers.

Extended Rationale: Based on information about the amount of money Mr. Gonzalez is able to spend and the items he is interested in purchasing, this question asks students to write and solve an equation in order to determine the maximum number of bracelets he could buy. Students must include a set of computations that will lead to a correct solution, where work is provided to show each step in the process. As indicated in the rubric, student responses will be rated on whether they show sufficient work to indicate a thorough understanding of solving a word problem leading to an equation of the form $px + q = r$, where p, q, and r are specific rational numbers. The determining factor in demonstrating a thorough understanding is using mathematically sound procedures to lead to a correct solution.

In the first part, the correct equation could be determined by recognizing that the cost of the shirt and the cost of an unknown number of bracelets must be equal to $42.50. The amount of 29 represents the cost of the shirt, while 4.5x represents the cost of x bracelets, since each bracelet costs $4.50:

Equation: $29 + 4.50x = 42.50$

To answer the second part, the maximum number of bracelets can be determined by using properties of operations to solve the equation and find the value of x:

$$4.50x + 29 = 42.50$$
$$4.50x + 29 - 29 = 42.50 - 29$$
$$4.50x = 13.50$$
$$\frac{4.50}{4.50}x = \frac{13.50}{4.50}$$
$$x = 3$$

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

Equation $\underline{\$29.00 + \$4.50_x} = \$42.50$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$29\cancel{\$} + 4.50x = \overset{3\,\textcircled{\tiny 12}}{\cancel{4}2.50}$$
$$-\cancel{29} \qquad\qquad -29$$
$$\overline{\qquad\qquad 4.50x = 13.50}$$
$$\frac{4.50}{} \qquad \frac{4.50}{}$$

$$X = 3$$

Answer $\underline{\quad 3 \quad}$ bracelets

Score Point 3 (out of 3 points)

This response includes the correct solutions and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The initial equation is correct. In the second part, the equation is solved using a mathematically sound procedure, and the final solution is correct.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

$$4.50x + 29 = 42.50$$

Equation $\underline{4.50x + 29 = 4.50}$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$4.50x + 29 = 42.50$$
$$\underline{-29 \quad -29}$$
$$4.50x = 13.50$$
$$\overline{4.50} \quad \overline{4.50}$$
$$x = 3$$

Answer ___3___ bracelets

Score Point 3 (out of 3 points)

This response includes the correct solutions and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The initial equation written above the answer space is correct. A transcription error is made copying that equation to the answer space, but this does not detract from the demonstration of understanding. In the second part, the correct equation is solved using a mathematically sound procedure, and the final solution is correct.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

$$\begin{array}{r} 42.50 \\ -29.00 \\ \hline 13.50 \end{array}$$

Equation ___ $4.50x = 13.50$ ___

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$\frac{4.50x}{4.50} = \frac{13.50}{4.50}$$

$$x = 3$$

Answer ___ 3 ___ bracelets

Score Point 3 (out of 3 points)

This response includes the correct solutions and demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The cost of the shirt is subtracted from the total amount of money, and the equation given as the solution for the top portion is only for the bracelets. That is acceptable, as it is an equation that can be used to determine the correct number of bracelets. In the second part, the equation is solved using a mathematically sound procedure, and the final solution is correct.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

$$42.50 - 29.00 = 13.5$$

$$4.50x \le 13.5$$

Equation _____ $4.50x \le 13.50$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$4.50x \le 13.50$$

$$\frac{13.5}{4.5} = 3$$

Answer ___3___ bracelets

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The solution provided for the equation, while demonstrating partial understanding, is an inequality instead of an equation. However, the work provided does use the inequality to correctly derive the maximum number of bracelets that Mr. Gonzales could buy, and the solution provided is correct.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

Equation $(42.50 - 29) \div 4.50$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$42.50 - 29 = 13.5$

$13.5 \div 4.50 = 3$

Answer ___3___ bracelets

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. For the first part, an expression without a variable is provided and, while this demonstrates partial understanding, it is not an equation. In the second part, the expression is correctly simplified, and the number of bracelets is correct.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

Equation $\underline{\ 42.50 = 29 + 4.50x\ }$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$42.50 = 29 + 4.50x$$
$$-29 \quad -29$$
$$\frac{13.50}{4.50} \quad \frac{4.50x}{4.50}$$

$$\boxed{3 = x}$$

CK
$42.50 = 29 + 4.50x$
$42.50 = 29 + 4.50(3)$
$42.50 = 29 + 13.5$
$\quad -29 +$
$42.50 = 42.50$
plus tax so
only can
buy 2

Answer $\underline{\ 2\ }$ bracelets

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. A correct equation is given in the first part of the problem. In the second part, the equation is correctly solved; however, the attempt to account for tax results is an incorrect solution.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

$$\$29 + \$4.50x = \$42.50$$

Equation _____

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

Answer _____ bracelets

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. A correct equation is given in the first part. The second part is not completed.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

Equation $x = 42.50 - \$29.00 + \$4.50(x)$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$\begin{array}{r} 312 \\ \cancel{4}\cancel{2}.\cancel{50} \\ -29.00 \\ \hline 13.50 \end{array}$$

$$\begin{array}{r} 4.50 \\ +4.50 \\ \hline 9.00 \\ +4.50 \\ \hline 13.50 \end{array}$$

Answer _____3_____ bracelets

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. An incorrect equation, which contains an x on both sides of the equals sign, is given. The second part is correct.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

Equation $42.50 = 29 - 4.50x$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

$$42.50 = 29 + 4.50x$$
$$-29 \quad -29$$
$$13.00 = \frac{4.50x}{4.50}$$
$$\frac{13.00}{4.50}$$
$$2 = X$$

$$13.00$$
$$-4.50$$
$$8.50$$
$$-4.50$$
$$4.00$$

Answer __2__ bracelets

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. An incorrect equation is given in the first part (42.50 = 29 – 4.50x). In the second part, a correct equation is used (42.50 = 29 + 4.50x); however, the provided work contains a computational error (42.50 – 29 = 13.00) which leads to an incorrect solution.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine *x*, the maximum number of bracelets Mr. Gonzales could buy.

Equation $29\$ + x + tax \geq 42.50\$$

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

29

$$\begin{array}{r} 42.50 \\ -29 \quad\quad \\ \hline 13.50 \end{array}$$

Answer _____3_____ bracelets

Score Point 0 (out of 3 points)

This response is incorrect. The initial inequality is incorrect and no solution for that inequality is shown. The work leading to the solution (3) is not sufficient to demonstrate even a limited understanding.

Mr. Gonzales has only $42.50 to spend at a clothing store. He wants to buy a shirt that costs $29, including tax, and some bracelets that cost $4.50 each, including tax.

Write an equation to determine x, the maximum number of bracelets Mr. Gonzales could buy.

X 29 shirt

Equation ~~3 Bracelets~~   42.50 A Shirt
                                    3 braclets

Solve the equation to determine the number of bracelets Mr. Gonzales could buy.

Show your work.

Answer ___3___ bracelets

2-Point Holistic Rubric

Score Points:

2 Points	A two-point response includes the correct solution to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution and the demonstration of a thorough understanding
1 Point	A one-point response demonstrates only a partial understanding of the mathematical concepts and/or procedures in the task. This response • correctly addresses only some elements of the task • may contain an incorrect solution but applies a mathematically appropriate process • may contain the correct solution but required work is incomplete
0 Points*	A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

3-Point Holistic Rubric

Score Points:

3 Points	A three-point response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution(s) and the demonstration of a thorough understanding
2 Points	A two-point response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task. This response • appropriately addresses most, but not all aspects of the task using mathematically sound procedures • may contain an incorrect solution but provides sound procedures, reasoning, and/or explanations • may reflect some minor misunderstanding of the underlying mathematical concepts and/or procedures
1 Point	A one-point response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task. This response • may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete • exhibits multiple flaws related to misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning • reflects a lack of essential understanding of the underlying mathematical concepts • may contain the correct solution(s) but required work is limited
0 Points*	A zero-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

2014 2- and 3-Point Mathematics Scoring Policies

Below are the policies to be followed while scoring the mathematics tests for all grades:

1. If a student does the work in other than a designated "Show your work" area, that work should still be scored. (Additional paper is an allowable accommodation for a student with disabilities if indicated on the student's Individual Education Program or Section 504 Accommodation Plan.)

2. If the question requires students to show their work, and the student shows appropriate work and clearly identifies a correct answer but fails to write that answer in the answer blank, the student should still receive full credit.

3. In questions that provide ruled lines for students to write an explanation of their work, mathematical work shown elsewhere on the page should be considered and scored.

4. If the student provides one legible response (and one response only), teachers should score the response, even if it has been crossed out.

5. If the student has written more than one response but has crossed some out, teachers should score only the response that has **not** been crossed out.

6. Trial-and-error responses are **not** subject to Scoring Policy #5 above, since crossing out is part of the trial-and-error process.

7. If a response shows repeated occurrences of the same conceptual error within a question, the student should **not** be penalized more than once.

8. In questions that require students to provide bar graphs,

   - in Grades 3 and 4 only, touching bars are acceptable
   - in Grades 3 and 4 only, space between bars does **not** need to be uniform
   - in all grades, widths of the bars must be consistent
   - in all grades, bars must be aligned with their labels
   - in all grades, scales must begin at 0, but the 0 does **not** need to be written

9. In questions requiring number sentences, the number sentences must be written horizontally.

10. In pictographs, the student is permitted to use a symbol other than the one in the key, provided that the symbol is used consistently in the pictograph; the student does not need to change the symbol in the key. The student may **not**, however, use multiple symbols within the chart, nor may the student change the value of the symbol in the key.

11. If students are not directed to show work, any work shown will not be scored. This applies to items that do not ask for any work and items that ask for work for one part and do not ask for work in another part.

12. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.