



**pennsylvania**  
DEPARTMENT OF EDUCATION

# The Pennsylvania System of School Assessment

## Mathematics Item and Scoring Sampler



**2018–2019**  
**Grade 4**

Pennsylvania Department of Education Bureau of Curriculum, Assessment and Instruction—September 2018

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## INTRODUCTION

### General Introduction

The Pennsylvania Department of Education (PDE) provides districts and schools with tools to assist in delivering focused instructional programs aligned with the Pennsylvania Core Standards (PCS). These tools include Academic Standards, Assessment Anchor documents, assessment handbooks, and content-based item and scoring samplers. This Item and Scoring Sampler is a useful tool for Pennsylvania educators in preparing local instructional programs. It can also be useful in preparing students for the statewide assessment.

This Item and Scoring Sampler is available in Braille format. For more information regarding Braille call (717) 901-2238.

### Pennsylvania Core Standards (PCS)

This sampler contains examples of test questions designed to assess the Pennsylvania Assessment Anchors and Eligible Content aligned to the Pennsylvania Core Standards. The Mathematics, Reading, and Writing PSSA transitioned to PCS-based operational Mathematics and English Language Arts assessments starting with the spring 2015 PSSA administration.

The 2013 PCS-aligned Assessment Anchor and Eligible Content documents are posted on this portal:

- [www.education.pa.gov](http://www.education.pa.gov) [Roll over 'DATA AND REPORTING' in the dark blue bar across the top of the page. Select 'ASSESSMENT AND ACCOUNTABILITY.' Click on the link that reads 'Pennsylvania System of School Assessment (PSSA)'. Then click on 'Assessment Anchors/Eligible Content!']

### What Is Included

This sampler contains test questions (items) that have been written to align to the Assessment Anchors that are based on the Pennsylvania Core Standards (PCS). The test questions provide an idea of the types of items that will appear on an operational, PCS-based PSSA. Each sample test question has been through a rigorous review process to ensure alignment with the Assessment Anchors.

### Purpose and Uses

The items in this sampler may be used as examples for creating assessment items at the classroom level, and they may also be copied and used as part of a local instructional program.<sup>1</sup> Classroom teachers may find it beneficial to have students respond to the open-ended item in this sampler. Educators can then use the sampler as a guide to score the responses either independently or together with colleagues within a school or district.

### Item Format and Scoring Guidelines

The multiple-choice (MC) items have four answer choices. Each correct response to an MC item is worth one point.

Each open-ended (OE) item is designed to take approximately ten to fifteen minutes to complete. During the administration of the PSSA, students are given additional time as necessary to complete the test items. Each OE item in mathematics is scored using an item-specific scoring guideline based on a 0–4-point scale. In this sampler, every item-specific scoring guideline is combined with examples of student responses that represent each score point to form a practical, item-specific scoring guide.

This sampler also includes the *General Description of Scoring Guidelines for Mathematics Open-Ended Questions* that students will have access to during a PSSA mathematics administration. The general description of scoring guidelines can be distributed to students for use during local assessments and can also be used by educators when scoring local assessments.<sup>1</sup>

<sup>1</sup> The permission to copy and/or use these materials does not extend to commercial purposes.

## Item Alignment

All PSSA items are aligned to statements and specifications included in the *Assessment Anchors and Eligible Content Aligned to the Pennsylvania Core Standards*. The mathematics content, process skills, directives, and action statements included in the PSSA mathematics questions align with the Assessment Anchor Content Standards. The Eligible Content statements represent the limits of the content of the mathematics questions.

## Testing Time and Mode of Testing Delivery for the PSSA

The PSSA is delivered in traditional paper-and-pencil format as well as in an online format. The estimated time to respond to a test question is the same for both methods of test delivery. During an official testing administration, students are given additional time as necessary to complete the test questions. The following table shows the estimated response time for each item type.

<b>Mathematics Item Type</b>	<b>MC</b>	<b>OE</b>
Estimated Response Time (minutes)	2	10 to 15

## Mathematics Reporting Categories

The Assessment Anchors are organized into four classifications as listed below.

• A = Numbers and Operations	• C = Geometry
• B = Algebraic Concepts	• D = Data Analysis and Probability

These four classifications are used throughout the grade levels. In addition to these classifications, there are five Reporting Categories for each grade level. The first letter of each Reporting Category represents the classification; the second letter represents the Domain as stated in the Common Core State Standards for Mathematics. Listed below are the Reporting Categories for Grade 4.

- A-T = Numbers and Operations in Base Ten
- A-F = Numbers and Operations—Fractions
- B-O = Operations and Algebraic Thinking
- C-G = Geometry
- D-M = Measurement and Data

Examples of multiple-choice and open-ended items assessing these categories are included in this booklet.

**General Description of Scoring Guidelines for Mathematics Open-Ended Questions**

**4— The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.**

The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor “blemish” or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

**3— The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.**

The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a *general* understanding.

**2— The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.**

The response is somewhat correct with *partial* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

**1— The response demonstrates a *minimal* understanding of the mathematical concepts and procedures required by the task.**

**0— The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures required by the task for that grade level.**

Special Categories within zero reported separately:

- Blank**.....Blank, entirely erased, entirely crossed out, or consists entirely of whitespace
- Refusal**.....Refusal to respond to the task
- Off Task**.....Makes no reference to the item but is not an intentional refusal
- Foreign Language**.....Written entirely in a language other than English
- Illegible** .....Illegible or incoherent

## Item and Scoring Sampler Format

This sampler includes the test directions and scoring guidelines that appear in the PSSA Mathematics assessments. Each multiple-choice item is followed by a table that includes the alignment, the answer key, the depth of knowledge (DOK) level, the percentage<sup>2</sup> of students who chose each answer option, and a brief answer-option analysis or rationale. The open-ended item is followed by a table that includes the item alignment, DOK level, and mean student score. Additionally, each of the included item-specific scoring guidelines is combined with sample student responses representing each score point to form a practical, item-specific scoring guide. The *General Description of Scoring Guidelines for Mathematics Open-Ended Questions* used to develop the item-specific scoring guidelines should be used if any additional item-specific scoring guidelines are created for use within local instructional programs.

### Example Multiple-Choice Item Information Table

Item Information	
Alignment	Assigned AAEC
Answer Key	Correct Answer
Depth of Knowledge	Assigned DOK
<i>p</i> -value A	Percentage of students who selected each option
<i>p</i> -value B	Percentage of students who selected each option
<i>p</i> -value C	Percentage of students who selected each option
<i>p</i> -value D	Percentage of students who selected each option
Option Annotations	Brief answer-option analysis or rationale

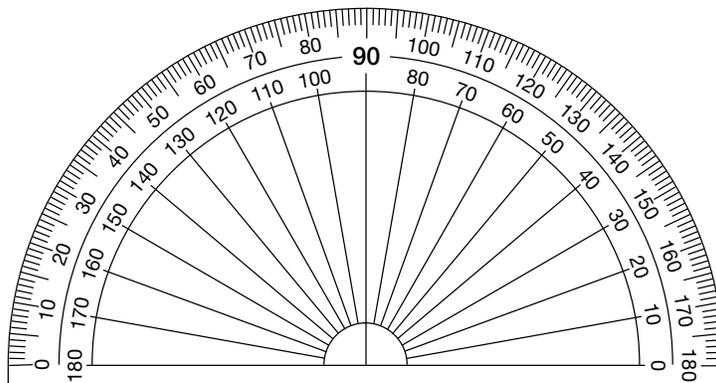
### Example Open-Ended Item Information Table

Alignment	Assigned AAEC	Depth of Knowledge	Assigned DOK	Mean Score	

<sup>2</sup> All *p*-value percentages listed in the item information tables have been rounded.

### Grade 4 Protractor

The protractor shown below is not intended to be used to measure. It has been included as a representation of the protractors that will be provided for students when they take the test. Due to differences in printers, the protractor may not accurately reproduce to scale.



**Grade 4 Formula Sheet**

Formulas and conversions that you may need on this test are found below.  
 You may refer back to this page at any time during the mathematics test.

2018  
 Grade 4

**Standard Conversions**

- 1 yard (yd) = 3 feet (ft)
- 1 foot = 12 inches (in.)
  
- 1 pound (lb) = 16 ounces (oz.)
  
- 1 gallon (gal) = 4 quarts (qt)
- 1 quart = 2 pints (pt)
- 1 pint = 2 cups (c)

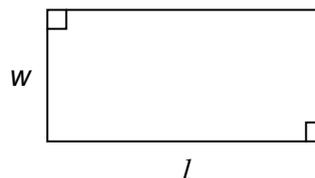
**Metric Conversions**

- 1 kilometer (km) = 1,000 meters (m)
- 1 meter = 100 centimeters (cm)
  
- 1 kilogram (kg) = 1,000 grams (g)
  
- 1 liter (L) = 1,000 milliliters (mL)

**Time Conversions**

- 1 year (yr) = 12 months (mo)
- 1 year = 52 weeks (wk)
- 1 year = 365 days
- 1 week = 7 days
- 1 day = 24 hours (hr)
- 1 hour = 60 minutes (min)
- 1 minute = 60 seconds (sec)

**Rectangle**



Area = length  $\times$  width  
 $A = l \times w$

Perimeter = length + length + width + width  
 $P = l + l + w + w$

## Mathematics Test Directions

On the following pages are the mathematics questions.

- You may not use a calculator for question 1. You may use a calculator for all other questions on this test.
- You may need a protractor for questions on this test.

### Directions for Multiple-Choice Questions:

Some questions will ask you to select an answer from among four choices.

For the multiple-choice questions:

- First solve the problem on scratch paper.
- Choose the correct answer and record your choice in the answer booklet.
- If none of the choices matches your answer, go back and check your work for possible errors.
- Only one of the answers provided is the correct response.

### Directions for Open-Ended Questions:

Some questions will require you to write your response.

For the open-ended questions:

- These questions have more than one part. Be sure to read the directions carefully.
- You cannot receive the highest score for an open-ended question without completing all tasks in the question. For example, if the question asks you to show your work or explain your reasoning, be sure to show your work or explain your reasoning in the space provided.
- If the question does **not** ask you to show your work or explain your reasoning, you may use the space provided, but only those parts of your response that the question specifically asks for will be scored.
- Write your response in the appropriate location within the response box in the answer booklet. Some answers may require graphing, plotting, labeling, drawing, or shading. If you use scratch paper, be sure to transfer your final response and any needed work or reasoning to the answer booklet.

Question 1 in this sampler is to be solved without the use of a calculator.

### MULTIPLE-CHOICE ITEMS

1. Divide:  $5,917 \div 4$

- A. 1,201
- B. 1,254 R1
- C. 1,319 R1
- D. 1,479 R1

Item Information	
Alignment	A-T.2.1.3
Answer Key	D
Depth of Knowledge	1
p-value A	11%
p-value B	13%
p-value C	11%
p-value D	65% (correct answer)
Option Annotations	<ul style="list-style-type: none"> <li>A. divides straight across without subtracting</li> <li>B. subtracts 49 from the dividend instead of 4 in the first step</li> <li>C. incorrectly divides 19 by 4 in the second step and skips bringing down the 1 from the tens place</li> <li>D. correct</li> </ul>

A calculator is permitted for use in solving questions 2–16 in this sampler.

2. Angie has a box that is  $\frac{3}{4}$  foot long. Which fraction is equal to the length, in feet, of the box?
- A.  $\frac{6}{12}$
- B.  $\frac{8}{12}$
- C.  $\frac{9}{12}$
- D.  $\frac{11}{12}$

Item Information	
Alignment	A-F.1.1.1
Answer Key	C
Depth of Knowledge	1
p-value A	25%
p-value B	11%
p-value C	55% (correct answer)
p-value D	9%
Option Annotations	A. divides to find the conversion factor of 3, but adds 3 to numerator B. uses change in the denominator (8) as the numerator C. correct D. adds 8 to both numerator and denominator

3. In a mixture of paint,  $\frac{2}{6}$  of the paint is red. The mixture contains 5 gallons of paint. How many gallons of red paint are in the mixture?
- A.  $\frac{2}{30}$
- B.  $\frac{2}{11}$
- C.  $\frac{7}{6}$
- D.  $\frac{10}{6}$

Item Information	
Alignment	A-F.2.1.6 A-F.2.1.7
Answer Key	D
Depth of Knowledge	2
p-value A	21%
p-value B	17%
p-value C	25%
p-value D	37% (correct answer)
Option Annotations	A. multiplies the denominator by 5 B. adds 5 to the denominator C. adds 5 to the numerator D. correct

4. Kim has a ribbon that is 0.45 meter long. Which expression is equal to the length, in meters, of Kim's ribbon?
- A.  $\frac{4}{100} + \frac{5}{100}$
- B.  $\frac{4}{10} + \frac{5}{100}$
- C.  $\frac{4}{10} + \frac{5}{10}$
- D.  $\frac{4}{100} + \frac{5}{10}$

Item Information	
Alignment	A-F.3.1
Answer Key	B
Depth of Knowledge	2
p-value A	26%
p-value B	49% (correct answer)
p-value C	15%
p-value D	10%
Option Annotations	A. uses one hundred for both denominators B. correct C. uses ten for both denominators D. switches denominators

5. Kate walks 0.65 kilometer to school each day. Jane walks 0.47 kilometer to school each day. Which statement comparing the distance each girl walks to school is true?
- A. Kate walks a longer distance to school than Jane walks because  $0.05 > 0.07$ .
  - B. Kate walks a longer distance to school than Jane walks because  $0.6 > 0.4$ .
  - C. Kate walks a shorter distance to school than Jane walks because  $0.05 < 0.07$ .
  - D. Kate walks a shorter distance to school than Jane walks because  $0.6 < 0.4$ .

Item Information	
Alignment	A-F.3.1.3
Answer Key	B
Depth of Knowledge	1
p-value A	9%
p-value B	69% (correct answer)
p-value C	16%
p-value D	6%
Option Annotations	A. compares hundredths and confuses symbols B. correct C. compares hundredths D. confuses symbols

6. Jordan and Sara are reading different books. Jordan’s book has 70 pages. The number of pages in Sara’s book is a factor of the number of pages in Jordan’s book. How many pages could be in Sara’s book?
- A. 17
  - B. 35
  - C. 140
  - D. 170

Item Information	
Alignment	B-O.2
Answer Key	B
Depth of Knowledge	1
p-value A	7%
p-value B	52% (correct answer)
p-value C	28%
p-value D	13%
Option Annotations	<ul style="list-style-type: none"> <li>A. chooses the number because it has a 7 in it</li> <li>B. correct</li> <li>C. confuses a multiple with a factor</li> <li>D. confuses a multiple with a factor, and thinks 170 is a multiple</li> </ul>

7. Kelly made a number pattern. Each number in her pattern is a multiple of 3. Which rule could describe Kelly's pattern?
- A. start at 0 and add 6
  - B. start at 1 and add 3
  - C. start at 2 and add 1
  - D. start at 3 and add 10

Item Information	
Alignment	B-O.3.1
Answer Key	A
Depth of Knowledge	2
p-value A	36% (correct answer)
p-value B	35%
p-value C	15%
p-value D	14%
Option Annotations	<ul style="list-style-type: none"> <li>A. correct</li> <li>B. thinks the +3 will result in multiples of 3</li> <li>C. chooses option with the first number in the pattern of 3</li> <li>D. thinks numbers ending in 3 are multiples of 3</li> </ul>

8. The table below shows the amounts of oats, in tablespoons, in different numbers of servings of granola bars.

Oats in Granola Bars

Number of Servings	Oats (tablespoons)
4	32
6	48
10	80
18	144

The pattern continues. Which rule describes the amount of oats, in tablespoons, in any number of servings of granola bars?

- A. Multiply the number of servings of granola bars by 2.
- B. Multiply the number of servings of granola bars by 4.
- C. Multiply the number of servings of granola bars by 8.
- D. Multiply the number of servings of granola bars by 16.

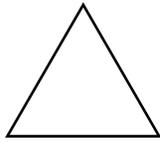
Item Information	
Alignment	B-O.3.1.3
Answer Key	C
Depth of Knowledge	2
p-value A	15%
p-value B	12%
p-value C	60% (correct answer)
p-value D	13%
Option Annotations	A. finds the difference in the number of servings B. uses the first number in the number of servings column C. correct D. finds the difference between the numbers in the oats column

9. Reed draws a straight line. He then draws a ray starting from a point on the straight line. Drawing the ray creates two separate angles. One of the angles is an obtuse angle. Which term describes the other angle?
- A. acute
  - B. obtuse
  - C. right
  - D. straight

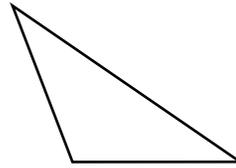
Item Information	
Alignment	C-G.1.1.1
Answer Key	A
Depth of Knowledge	1
p-value A	49% (correct answer)
p-value B	11%
p-value C	18%
p-value D	22%
Option Annotations	<ul style="list-style-type: none"> <li>A. correct</li> <li>B. assumes the two angles are the same type</li> <li>C. picks a common angle type</li> <li>D. picks based on the straight line</li> </ul>

10. A city park is in the shape of a right triangle. A path runs through the middle of the park, creating two symmetrical halves. Which picture could be the shape of the park?

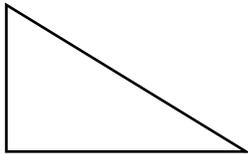
A.



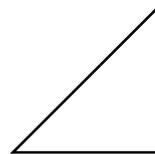
B.



C.

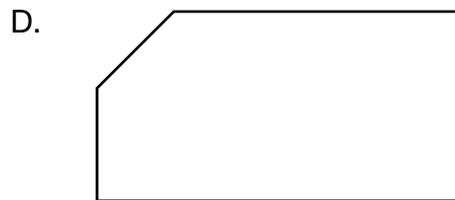
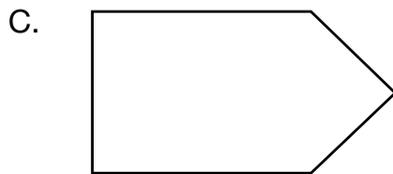
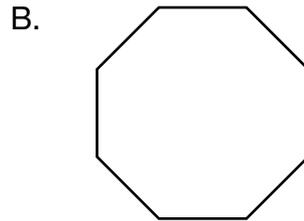
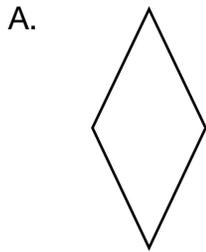


D.



Item Information	
Alignment	C-G.1.1.2 C-G.1.1.3
Answer Key	D
Depth of Knowledge	2
p-value A	25%
p-value B	10%
p-value C	19%
p-value D	46% (correct answer)
Option Annotations	A. chooses a triangle with multiple lines of symmetry B. chooses a symmetric but non-right triangle C. chooses a right triangle but one without symmetry D. correct

11. Dina drew a figure that has at least one line of symmetry and at least one right angle. Which shape could be the figure Dina drew?

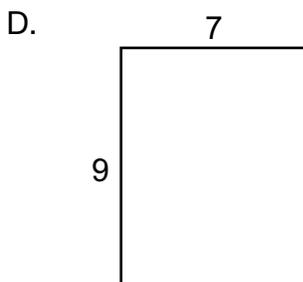
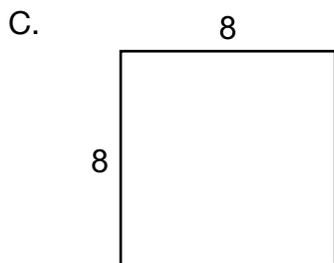
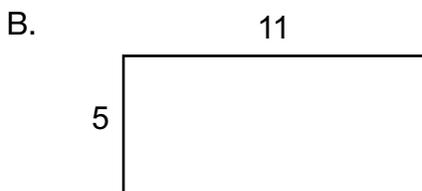
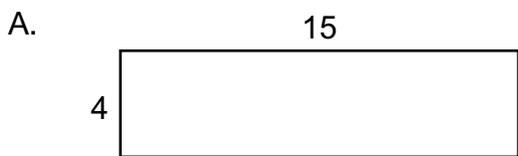


Item Information	
Alignment	C-G.1.1.3 C-G.1.1.1
Answer Key	C
Depth of Knowledge	2
p-value A	8%
p-value B	8%
p-value C	72% (correct answer)
p-value D	12%
Option Annotations	A. chooses option where lines of symmetry cross at right angles B. chooses option where lines of symmetry create right angles with edges of shape C. correct D. chooses option with right angles, but no lines of symmetry

12. Paul had 3 **pints** of vegetable oil. He used 1 **cup** of the vegetable oil in a recipe. How many **cups** of vegetable oil does Paul still have?
- A. 1 cup
  - B. 2 cups
  - C. 4 cups
  - D. 5 cups

Item Information	
Alignment	D-M.1.1.2
Answer Key	D
Depth of Knowledge	1
p-value A	10%
p-value B	25%
p-value C	17%
p-value D	48% (correct answer)
Option Annotations	<ul style="list-style-type: none"> <li>A. uses 1 from the stem</li> <li>B. does not convert the 3 pints to cups before subtracting</li> <li>C. adds the 3 and 1 from the stem</li> <li>D. correct</li> </ul>

13. Which rectangle has the **greatest** area?



Item Information	
Alignment	D-M.1.1.3
Answer Key	C
Depth of Knowledge	1
p-value A	34%
p-value B	5%
p-value C	54% (correct answer)
p-value D	7%
Option Annotations	A. chooses option with the greatest length/perimeter B. chooses option with the least area C. correct D. chooses option with the greatest width

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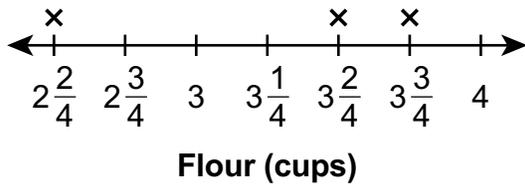
14. The table below shows the numbers of batches of different types of muffins made at a bakery and the amount of flour, in cups, used per batch for each type of muffin.

Muffin Batches

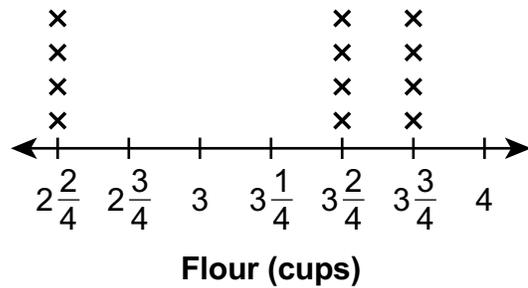
Type of Muffin	Number of Batches Made	Flour Used per Batch (cups)
blueberry	4	$3\frac{3}{4}$
chocolate chip	3	$2\frac{2}{4}$
poppy seed	5	$3\frac{2}{4}$

Which line plot represents the information in the table?

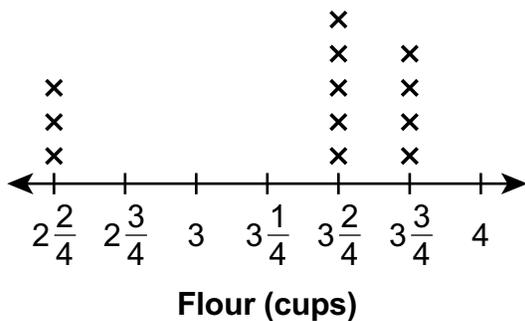
A. Muffin Batches



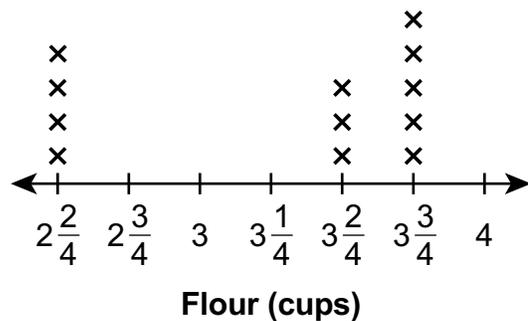
B. Muffin Batches



C. Muffin Batches

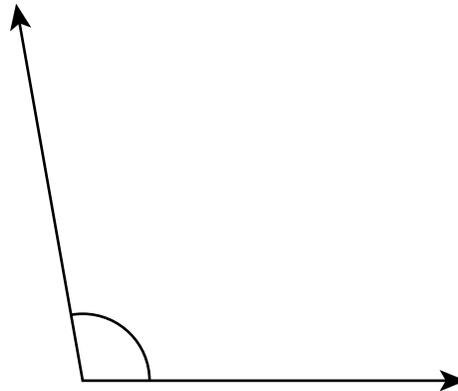


D. Muffin Batches



Item Information	
Alignment	D-M.2.1.1 D-M.2.1.3
Answer Key	C
Depth of Knowledge	2
p-value A	11%
p-value B	8%
p-value C	69% (correct answer)
p-value D	12%
Option Annotations	A. marks only 1 'x' per measurement B. marks the correct total, but the incorrect average for each measurement C. correct D. marks the line plot to match the table

15. Jillian drew the angle shown below.



Using your protractor, what is the measure of Jillian's angle?

- A. 80°
- B. 90°
- C. 100°
- D. 180°

Item Information	
Alignment	D-M.3.1.1
Answer Key	C
Depth of Knowledge	1
p-value A	25%
p-value B	8%
p-value C	58% (correct answer)
p-value D	9%
Option Annotations	A. reads the measurement for an acute angle B. estimates the angle without looking at the protractor C. correct D. reads the measurement of the horizontal ray

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**OPEN-ENDED QUESTION**

16. Sergio, Tina, Jong, David, and Beth collect coins.

Sergio has 4 times as many coins in his collection as Tina has in her collection. Tina has 19 coins in her collection.

- A.** How many total coins does Sergio have in his collection?

Jong has 315 coins. He separates his coins into 5 different piles. Each pile has the same number of coins.

- B.** How many coins are in each of Jong's piles?

Go to the next page to finish question 16.



16. **Continued.** Please refer to the previous page for task explanation.

David started his coin collection with 14 coins. He added 3 coins to his collection at the end of each month for 5 months.

- C. How many coins were in David's collection at the end of the 5 months?

Beth determined that the total value of her coins is 82 cents. An equation can be used to determine the value of Beth's coins, but the symbols are missing.

- D. Complete the equation below using the symbols +, −, ×, or ÷ to make the equation true.

$$7 \text{ \_\_\_\_ } 3 \text{ \_\_\_\_ } 25 = 82$$

**After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.**



## Item-Specific Scoring Guideline

### #16 Item Information

<b>Alignment</b>	B-O.1	<b>Depth of Knowledge</b>	2	<b>Mean Score</b>	2.39
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### Assessment Anchor this item will be reported under:

M04.B-O.1—Use the four operations with whole numbers to solve problems.

### Specific Assessment Anchor Descriptor addressed by this item:

M04.B-O.1.1—Use numbers and symbols to model the concepts of expressions and equations.

### Scoring Guide

Score	In this item, the student . . .
4	Demonstrates a thorough understanding of using the four operations with whole numbers by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of using the four operations with whole numbers by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of using the four operations with whole numbers by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of using the four operations with whole numbers.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

### Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3 points.
2	Student earns 2 points.
1	Student earns 1 point. OR Student demonstrates minimal understanding of using the four operations with whole numbers.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

**Top-Scoring Response**

**Part A (1 point):**

1 point for correct answer

What?	Why?
76 (coins)	

**Part B (1 point):**

1 point for correct answer

What?	Why?
63 (coins)	

**Part C (1 point):**

1 point for correct answer

What?	Why?
29 (coins)	

**Part D (1 point):**

1 point for correct answer

What?	Why?
$7 \div 3 \times 25 = 82$	

STUDENT RESPONSE

Response Score: 4 points



PARTS A AND B

Question 16  
Page 1 of 2

Item ID

?

Sergio, Tina, Jong, David, and Beth collect coins.

Sergio has 4 times as many coins in his collection as Tina has in her collection. Tina has 19 coins in her collection.

**A.** How many total coins does Sergio have in his collection?

Eq  
76 coins

The response provides a correct answer.

Jong has 315 coins. He separates his coins into 5 different piles. Each pile has the same number of coins.

**B.** How many coins are in each of Jong's piles?

Eq  
63 coins

The response provides a correct answer.

Next

Options

Flag

Pause

Review/End Test

PARTS C AND D

Question 16  
Page 2 of 2

Item ID

?









Sergio, Tina, Jong, David, and Beth collect coins.

David started his coin collection with 14 coins. He added 3 coins to his collection at the end of each month for 5 months.

**C.** How many coins were in David's collection at the end of the 5 months?

Eq

29 coins

The response provides a correct answer.

Beth determined that the total value of her coins is 82 cents. An equation can be used to determine the value of Beth's coins, but the symbols are missing.

**D.** Complete the equation below using the symbols +, −, ×, or ÷ to make the equation true.

Eq

7

+

Eq

3

×

Eq

25

=

82

The response provides a correct answer.

Review/End Test

Pause

Flag

Options

Back

Next

## STUDENT RESPONSE

Response Score: 3 points

16. Sergio, Tina, Jong, David, and Beth collect coins.

Sergio has 4 times as many coins in his collection as Tina has in her collection. Tina has 19 coins in her collection.

A. How many total coins does Sergio have in his collection?

$$19 \times 4 = 76 \text{ coins}$$

The response provides a correct answer.

Jong has 315 coins. He separates his coins into 5 different piles. Each pile has the same number of coins.

B. How many coins are in each of Jong's piles?

$$315 \div 5 = 63 \text{ coins}$$

The response provides a correct answer.

Go to the next page to finish question 16.



16. **Continued.** Please refer to the previous page for task explanation.

David started his coin collection with 14 coins. He added 3 coins to his collection at the end of each month for 5 months.

- C. How many coins were in David's collection at the end of the 5 months?

$$14 + 15 = 29 \text{ coins}$$

The response provides a correct answer.

Beth determined that the total value of her coins is 82 cents. An equation can be used to determine the value of Beth's coins, but the symbols are missing.

- D. Complete the equation below using the symbols +, −, ×, or ÷ to make the equation true.

$$7 \times 3 \div 25 = 82$$

The response provides an incorrect answer.

**After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.**



STUDENT RESPONSE

Response Score: 2 points



PARTS A AND B

Question 16  
Page 1 of 2

Item ID

?

←

↶

↷

↵

Line Guide

Calculator

Protractor

Sergio, Tina, Jong, David, and Beth collect coins.

Sergio has 4 times as many coins in his collection as Tina has in her collection. Tina has 19 coins in her collection.

**A.** How many total coins does Sergio have in his collection?

EQ 76 coins

The response provides a correct answer.

Jong has 315 coins. He separates his coins into 5 different piles. Each pile has the same number of coins.

**B.** How many coins are in each of Jong's piles?

EQ 63coins

The response provides a correct answer.

Options

Flag

Pause

Review/End Test

Next

PARTS C AND D

Question 16  
Page 2 of 2

Item ID

?










Sergio, Tina, Jong, David, and Beth collect coins.

David started his coin collection with 14 coins. He added 3 coins to his collection at the end of each month for 5 months.

**C.** How many coins were in David's collection at the end of the 5 months?

EQ

54 coins

The response provides an incorrect answer.

Beth determined that the total value of her coins is 82 cents. An equation can be used to determine the value of Beth's coins, but the symbols are missing.

**D.** Complete the equation below using the symbols +, −, ×, or ÷ to make the equation true.

EQ

7

×

3

+

EQ

25

=

82

The response provides an incorrect answer.

Review/End Test

Pause

Flag

Options

Back

Next

## STUDENT RESPONSE

Response Score: 1 point

16. Sergio, Tina, Jong, David, and Beth collect coins.

Sergio has 4 times as many coins in his collection as Tina has in her collection. Tina has 19 coins in her collection.

A. How many total coins does Sergio have in his collection?

$$\begin{array}{r} 3 \\ 19 \\ \times 4 \\ \hline 76 \text{ coins} \end{array}$$

Sergio has 76 coins  
in his collection

The response provides a correct answer.

Jong has 315 coins. He separates his coins into 5 different piles. Each pile has the same number of coins.

B. How many coins are in each of Jong's piles?

$$\begin{array}{r} 2 \\ 315 \\ \times 5 \\ \hline 375 \end{array}$$

The response provides an incorrect answer.

Go to the next page to finish question 16.



16. **Continued.** Please refer to the previous page for task explanation.

David started his coin collection with 14 coins. He added 3 coins to his collection at the end of each month for 5 months.

- C. How many coins were in David's collection at the end of the 5 months?

19 coins

The response provides an incorrect answer.

Beth determined that the total value of her coins is 82 cents. An equation can be used to determine the value of Beth's coins, but the symbols are missing.

- D. Complete the equation below using the symbols +, −, ×, or ÷ to make the equation true.

$$7 \div 3 \times 25 = 82$$

The response provides an incorrect answer.

**After you have checked your work, close your answer booklet and test booklet so your teacher will know you are finished.**



STUDENT RESPONSE

Response Score: 0 points



PARTS A AND B

Question 16  
Page 1 of 2

Item ID

?

Sergio, Tina, Jong, David, and Beth collect coins.

Sergio has 4 times as many coins in his collection as Tina has in her collection. Tina has 19 coins in her collection.

**A.** How many total coins does Sergio have in his collection?

Eq

19+4=23

Jong has 315 coins. He separates his coins into 5 different piles. Each pile has the same number of coins.

**B.** How many coins are in each of Jong's piles?

Eq

315x5=1,575

Next

Options

Flag

Pause

Review/End Test

The response provides an incorrect answer.

The response provides an incorrect answer.

PARTS C AND D

Question 16  
Page 2 of 2

Item ID

?









Sergio, Tina, Jong, David, and Beth collect coins.

David started his coin collection with 14 coins. He added 3 coins to his collection at the end of each month for 5 months.

C. How many coins were in David's collection at the end of the 5 months?

Eq

14+3=17  
17x5=85

The response provides an incorrect answer.

Beth determined that the total value of her coins is 82 cents. An equation can be used to determine the value of Beth's coins, but the symbols are missing.

D. Complete the equation below using the symbols +, -, x, or ÷ to make the equation true.

Eq

7

x

3

+

Eq

25

=

82

The response provides an incorrect answer.

Review/End Test

Pause

Flag

Options

Back

Next

**MATHEMATICS—SUMMARY DATA**

**MULTIPLE-CHOICE**

Sample Number	Alignment	Answer Key	Depth of Knowledge	p-values A	p-values B	p-values C	p-values D
1	A-T.2.1.3	D	1	11%	13%	11%	65%
2	A-F.1.1.1	C	1	25%	11%	55%	9%
3	A-F.2.1.6 A-F.2.1.7	D	2	21%	17%	25%	37%
4	A-F.3.1	B	2	26%	49%	15%	10%
5	A-F.3.1.3	B	1	9%	69%	16%	6%
6	B-O.2	B	1	7%	52%	28%	13%
7	B-O.3.1	A	2	36%	35%	15%	14%
8	B-O.3.1.3	C	2	15%	12%	60%	13%
9	C-G.1.1.1	A	1	49%	11%	18%	22%
10	C-G.1.1.2 C-G.1.1.3	D	2	25%	10%	19%	46%
11	C-G.1.1.3 C-G.1.1.1	C	2	8%	8%	72%	12%
12	D-M.1.1.2	D	1	10%	25%	17%	48%
13	D-M.1.1.3	C	2	34%	5%	54%	7%
14	D-M.2.1.1 D-M.2.1.3	C	2	11%	8%	69%	12%
15	D-M.3.1.1	C	1	25%	8%	58%	9%

**OPEN-ENDED**

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
16	B-O.1	4	2	2.39

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INTENTIONALLY BLANK.**

# **PSSA Grade 4 Mathematics Item and Scoring Sampler**

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