pennsylvania
DEPARTMENT OF EDUCATION

The Pennsylvania System of School Assessment

Mathematics
Item and Scoring Sampler

2019–2020
Grade 3

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 2014 PCS-aligned Assessment Anchor and Eligible Content documents are posted on this portal:

➢ *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.[1] 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.[1]

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[1] 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.

Mathematics Item Type	MC	OE
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 3.

- 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.

Response may show only information copied from the question.

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[2] 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
p-value A	Percentage of students who selected each option
p-value B	Percentage of students who selected each option
p-value C	Percentage of students who selected each option
p-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**	

Grade 3 Ruler

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

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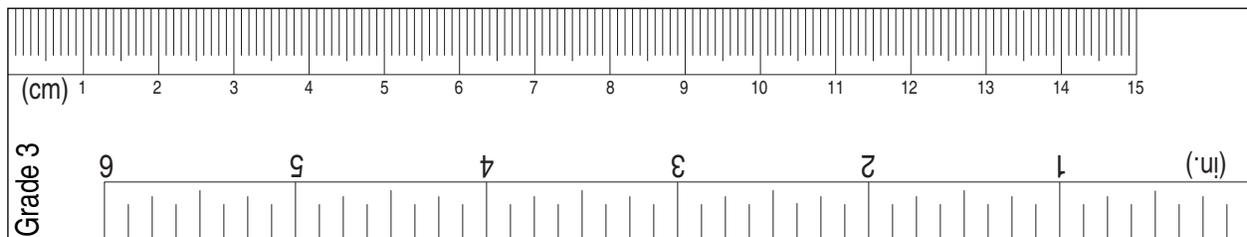
[2] All *p*-value percentages listed in the item information tables have been rounded.

MATHEMATICS TEST DIRECTIONS

Directions: On the following pages are the Mathematics questions.

- You may <u>not</u> use a calculator on this test.
- You may need a ruler for question(s) 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 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 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 booklet.

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MULTIPLE-CHOICE ITEMS

1. Mario picks a whole number from 2 to 6.

He multiplies the number by 10.

He adds 20 to the product.

Mario then completes one more step.

The result of Mario completing this last step is a 5 in the ones place.

Which step could be the last step Mario completes?

- Ⓐ   Mario adds 60 to the sum.
- Ⓑ   Mario subtracts 5 from the sum.
- Ⓒ   Mario multiplies the sum by 5.
- Ⓓ   Mario divides the sum by 6.

Item Information	
Alignment	A-T.1.1
Answer Key	B
Depth of Knowledge	2
p-value A	17%
p-value B	38% (correct answer)
p-value C	31%
p-value D	14%
Option Annotations	A. starts with 7 and ends with a 5 in the tens place B. correct C. thinks an operation involving 5 would give the result D. tries 1 as the first number without realizing this is not in the initial interval and saw that the result was 5

2. David correctly rounded the number of stickers he has to 300.

Which could be the number of stickers David has?

- Ⓐ 34
- Ⓑ 203
- Ⓒ 257
- Ⓓ 364

Item Information	
Alignment	A-T.1.1.1
Answer Key	C
Depth of Knowledge	1
p-value A	4%
p-value B	8%
p-value C	72% (correct answer)
p-value D	16%
Option Annotations	A. confuses tens and hundreds place values B. looks at ones digit only C. correct D. looks at hundreds digit only

3. Pat wins 209 tickets at a school fair.

Adam wins 253 tickets at the school fair.

They combine their tickets to buy a prize that costs 395 tickets.

How many tickets do they have remaining?

- Ⓐ   57
- Ⓑ   67
- Ⓒ   133
- Ⓓ   143

Item Information	
Alignment	A-T.1.1.2 B-O.3.1.1
Answer Key	B
Depth of Knowledge	2
p-value A	15%
p-value B	55% (correct answer)
p-value C	15%
p-value D	15%
Option Annotations	A. does not regroup the 1 when adding 209 and 253 B. correct C. subtracts 2 from 5 and 6 from 9 when subtracting 395 from 462 D. does not regroup the 1 when adding 209 and 253 and subtracts the 2 from 5 and 5 from 9 when subtracting 395 from 452

4. Frank took 3 piano lessons at school.

Each lesson was 90 minutes long.

He also took a guitar lesson that was 40 minutes long.

What was the total length of time, in minutes, of Frank's music lessons?

Ⓐ 130

Ⓑ 133

Ⓒ 210

Ⓓ 310

Item Information	
Alignment	A-T.1.1.3 A-T.1.1.2
Answer Key	D
Depth of Knowledge	2
p-value A	32%
p-value B	12%
p-value C	10%
p-value D	46% (correct answer)
Option Annotations	A. adds 90 and 40 B. adds all three values C. does not regroup when adding D. correct

5. The table below lists the amounts of time, in hours, it takes three students to go to school each morning.

Going to School

Student	Amount of Time (hours)
1	$\frac{1}{6}$
2	$\frac{4}{6}$
3	$\frac{3}{6}$

Which statement correctly compares the amounts of time, in hours, it takes two of the students to go to school?

Ⓐ $\frac{1}{6} > \frac{3}{6}$ because 1 is less than 3.

Ⓑ $\frac{4}{6} > \frac{3}{6}$ because 4 is greater than 3.

Ⓒ $\frac{1}{6} < \frac{4}{6}$ because the numerators are less than the denominators.

Ⓓ $\frac{4}{6} = \frac{3}{6}$ because both fractions have the same denominator.

Item Information	
Alignment	A-F.1.1.5
Answer Key	B
Depth of Knowledge	2
p-value A	18%
p-value B	56% (correct answer)
p-value C	20%
p-value D	6%
Option Annotations	A. uses the incorrect comparison symbol B. correct C. compares a numerator to a denominator D. compares denominators instead of numerators

6. Harsha has 48 toy cars.

She puts the toy cars on shelves.

She puts the same number of toy cars on each shelf.

Which sentence about the toy cars could be true?

Ⓐ   There are 6 shelves and 7 toy cars on each shelf.

Ⓑ   There are 6 shelves and 8 toy cars on each shelf.

Ⓒ   There are 7 shelves and 7 toy cars on each shelf.

Ⓓ   There are 7 shelves and 8 toy cars on each shelf.

Item Information	
Alignment	B-O.1.1.1
Answer Key	B
Depth of Knowledge	2
p-value A	14%
p-value B	59% (correct answer)
p-value C	14%
p-value D	13%
Option Annotations	A. multiplies incorrectly B. correct C. multiplies incorrectly D. multiplies incorrectly

7. Curt uses 42 pencils to make groups of pencils.

Each group has 7 pencils.

The equation $42 \div \square = 7$ describes this story.

Which sentence correctly explains what the $\square$ equals?

ⓐ   The $\square$ equals the 6 groups Curt made.

ⓑ   The $\square$ equals the 6 pencils Curt has remaining.

ⓒ   The $\square$ equals the 7 groups Curt made.

ⓓ   The $\square$ equals the 7 pencils Curt has remaining.

Item Information	
Alignment	B-O.1.2.2
	B-O.1.1.2
Answer Key	A
Depth of Knowledge	2
p-value A	56% (correct answer)
p-value B	16%
p-value C	19%
p-value D	9%
Option Annotations	A. correct
	B. picks the right number but does not know what it represents
	C. picks another interpretation for the number 7
	D. picks a correct interpretation of 7 in the problem but doesn't realize that 7 does not go in the box

8. An equation is shown below.

$$48 \div 12 = ?$$

Which number sentence shows another way to find the value of the unknown number?

- Ⓐ $12 \times ? = 48$
- Ⓑ $12 \times 48 = ?$
- Ⓒ $? \div 12 = 48$
- Ⓓ $12 \div 48 = ?$

Item Information	
Alignment	B-O.2.2.1
Answer Key	A
Depth of Knowledge	1
p-value A	66% (correct answer)
p-value B	10%
p-value C	11%
p-value D	13%
Option Annotations	A. correct B. knows that the problem could be solved with multiplication but confuses the factors C. knows that the problem could be solved with division but confuses the quotient and dividend D. knows that the problem could be solved with division but confuses the divisor and dividend

9. Bre puts 22 chocolate chip cookies onto a plate for her friends.

She puts 18 oatmeal cookies onto another plate.

Her friends eat 8 cookies.

Which estimate is **closest** to the number of cookies Bre still has?

- Ⓐ 10
- Ⓑ 30
- Ⓒ 40
- Ⓓ 50

Item Information	
Alignment	B-O.3.1
Answer Key	B
Depth of Knowledge	2
p-value A	24%
p-value B	56% (correct answer)
p-value C	14%
p-value D	6%
Option Annotations	A. rounds correctly but then subtracts 20 from 20 and rounds 8 cookies to 10 B. correct C. rounds 22 to 30 and then finds 30 + 20 − 10 D. accurately rounds all the numbers but then adds them together

10. The graph below shows the number of each animal in a pet store.

Animals in the Pet Store
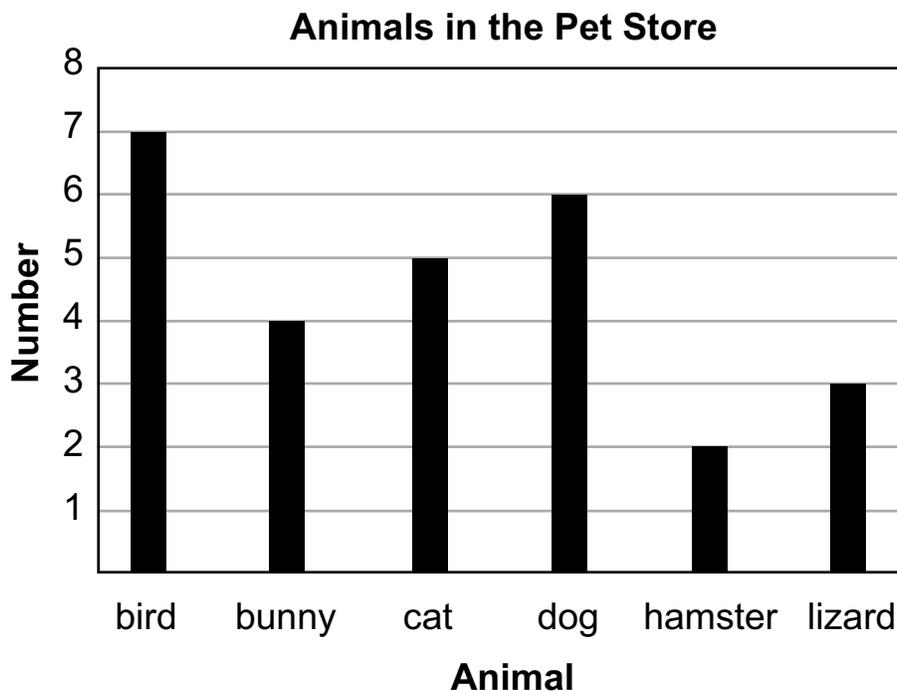
Maya is feeding the cats and dogs at the pet store.

She already gave food to 4 of the cats and none of the dogs.

Which number sentence can be used to find the total number of cats and dogs (□) Maya still needs to feed?

- Ⓐ $4 + \square = 11$
- Ⓑ $5 + 6 = \square$
- Ⓒ $13 - \square = 4$
- Ⓓ $27 - 4 = \square$

Item Information	
Alignment	B-O.3.1.2 D-M.2.1.2
Answer Key	A
Depth of Knowledge	2
p-value A	47% (correct answer)
p-value B	34%
p-value C	11%
p-value D	8%
Option Annotations	A. correct B. adds the cats and dogs but does not subtract those fed C. uses dogs and birds (two tallest bars) as the total to be fed D. uses all animals as the total

11. A family bought 8 gallons of orange juice this year.

The family also bought 1 gallon of apple juice this year.

The price of each gallon of juice was $4.00.

Which expression correctly shows how to find the total price of the juice the family bought this year?

Ⓐ $8 \times 4 + 4$

Ⓑ $8 + 4 + 4$

Ⓒ $8 \times 4 - 4$

Ⓓ $8 \times 4 \times 4$

Item Information	
Alignment	B-O.3.1.6
Answer Key	A
Depth of Knowledge	2
p-value A	53% (correct answer)
p-value B	14%
p-value C	12%
p-value D	21%
Option Annotations	A. correct B. adds all the numbers together C. subtracts 4 instead of adding 4 D. multiplies all the numbers

12. Some shapes are shown below.
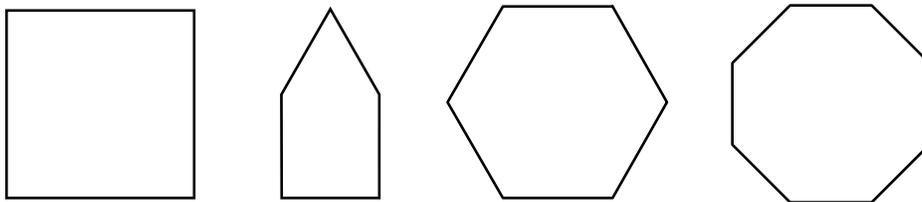
Which statement about the shapes is **most likely** true?

Ⓐ   Each shape is a pentagon.

Ⓑ   Each shape has an even number of sides.

Ⓒ   In each shape, every angle is equal in size.

Ⓓ   In each shape, every side is equal in length.

Item Information	
Alignment	C-G.1.1
Answer Key	D
Depth of Knowledge	1
p-value A	12%
p-value B	15%
p-value C	25%
p-value D	48% (correct answer)
Option Annotations	A. confuses the terms pentagon and polygon
	B. overlooks that the pentagon has an odd number of sides
	C. sees that each shape has at least one pair of equal-sized angles
	D. correct

13. Which shape is **not** a quadrilateral?

Ⓐ

Ⓑ

Ⓒ

Ⓓ
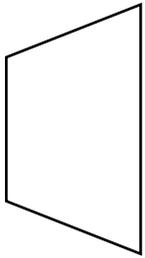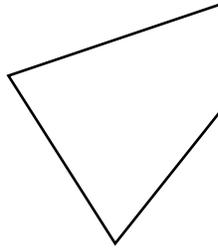
Item Information	
Alignment	C-G.1.1.2
Answer Key	A
Depth of Knowledge	1
p-value A	65% (correct answer)
p-value B	21%
p-value C	8%
p-value D	6%
Option Annotations	A. correct B. picks a shape that meets the criteria for a quadrilateral C. picks a shape that meets the criteria for a quadrilateral D. picks a shape that meets the criteria for a quadrilateral

14. Steve shaded a fraction of a shape's area as shown below.
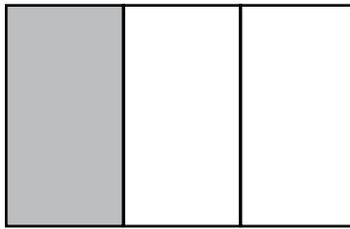
Which shape has the same fraction of its area shaded as the shape Steve shaded?

Ⓐ

Ⓑ

Ⓒ

Ⓓ
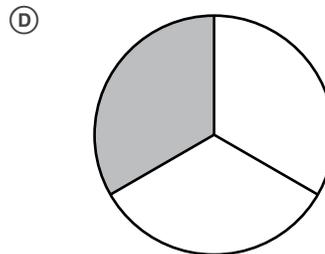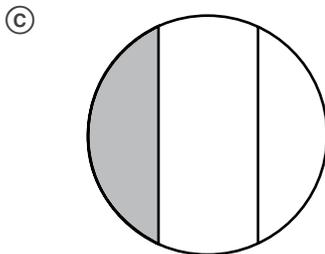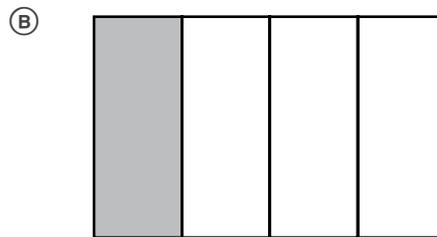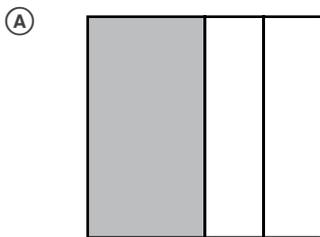
Item Information	
Alignment	C-G.1.1.3
Answer Key	D
Depth of Knowledge	1
p-value A	20%
p-value B	9%
p-value C	6%
p-value D	65% (correct answer)
Option Annotations	A. sees that the same actual area was shaded
	B. sees that the same size rectangle was used
	C. sees that the circle is also divided vertically into 3 parts
	D. correct

15. When Edwin left his home, he glanced at the clock.

He saw the minute hand pointing at the 9.

Edwin returned home less than one hour later.

When he walked in, he saw the minute hand pointing at the 6.
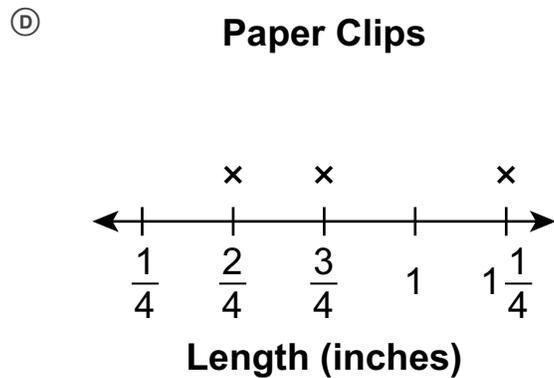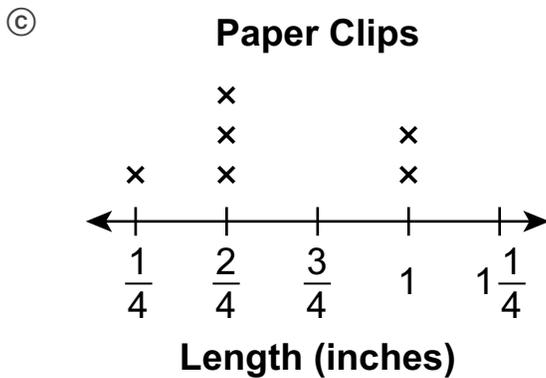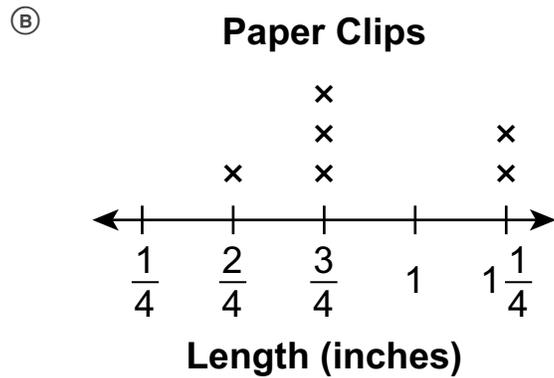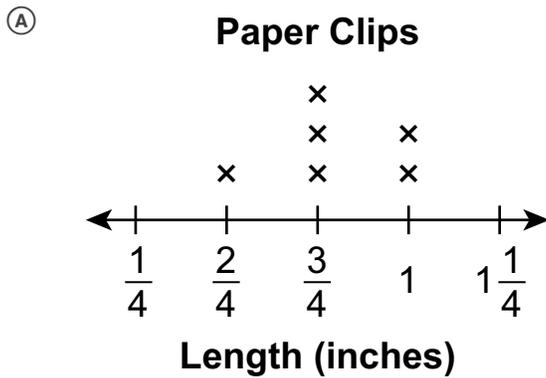
How many minutes was Edwin gone?

Ⓐ 3

Ⓑ 9

Ⓒ 15

Ⓓ 45

Item Information	
Alignment	D-M.1.1.2
Answer Key	D
Depth of Knowledge	2
p-value A	14%
p-value B	15%
p-value C	22%
p-value D	49% (correct answer)
Option Annotations	A. subtracts 6 from 9 (the numbers the minute hand was pointing to) B. considers the hours between the numbers the minute hand was pointing to (from 9 to 12 is 3 and from 12 to 6 is 6, for a total of 9) C. switches the start and finish D. correct

16. Sabrina measured the lengths of all the paper clips shown below.
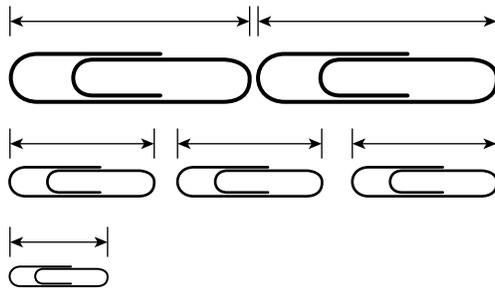
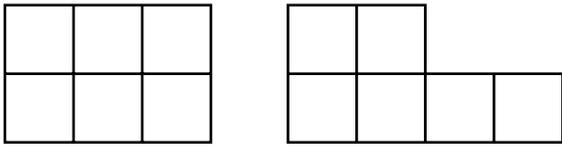Use your ruler to measure the lengths, in inches, of the paper clips.

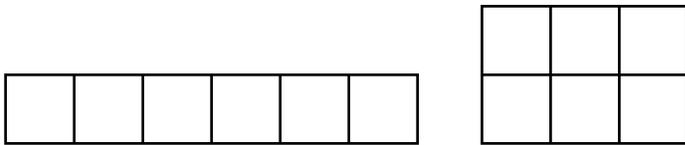Which line plot shows the lengths, in inches, of all the paper clips?

Ⓐ

Paper Clips

Length (inches)

Ⓑ

Paper Clips

Length (inches)

Ⓒ

Paper Clips

Length (inches)

Ⓓ

Paper Clips

Length (inches)

Item Information	
Alignment	D-M.2.1.3
Answer Key	B
Depth of Knowledge	1
p-value A	22%
p-value B	46% (correct answer)
p-value C	21%
p-value D	11%
Option Annotations	A. places the lengths for $1\frac{1}{4}$ inches at 1 inch B. correct C. places all the measures at $\frac{1}{4}$ inch less than the actual lengths D. identifies only one instance of each measure

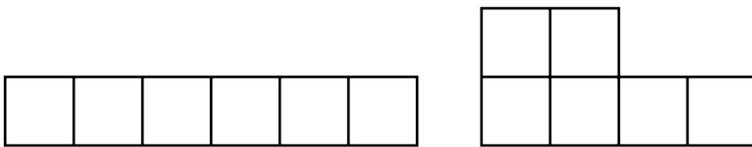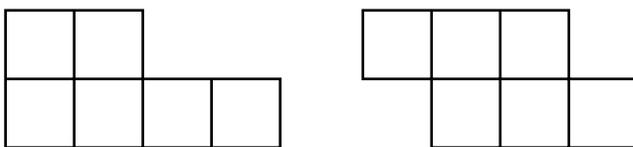**17.** In which pair do the figures have the same perimeter?

Ⓐ

Ⓑ

Ⓒ

Ⓓ

Item Information	
Alignment	D-M.4.1
Answer Key	D
Depth of Knowledge	1
p-value A	19%
p-value B	19%
p-value C	10%
p-value D	52% (correct answer)
Option Annotations	A. confuses area and perimeter B. chooses the two figures that are rectangles C. splits the second figure into a square and a rectangle, finds the perimeters of each, and adds to get 8 + 6 = 14 D. correct

OPEN-ENDED QUESTION
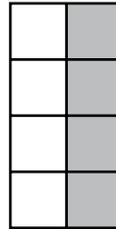
18. Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.
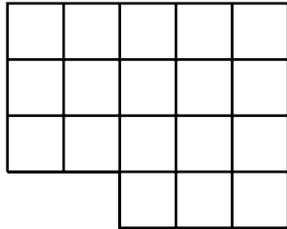
Miss Drake's Garden   **Mr. Lee's Garden**

☐ = 1 square meter   ☐ = 1 square meter

A. What is the area, in square meters, of Miss Drake's garden?

PUT your answer in the **BLANK BELOW**.

Answer: _____ square meters

The shaded part of Mr. Lee's garden shows where he plants corn.

B. In what fraction of his garden does Mr. Lee plant corn?

PUT your answer in the **BLANK BELOW**.

Answer: _____

Go to the next page to finish question 18.

GO ON ⟩

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

Mr. Tillman has a rectangular-shaped garden with an area of 24 square meters.

C. What could be the side lengths, in meters, of Mr. Tillman's garden?

PUT your answer in the **BLANKS BELOW**.

Length 1: _____ meters   **Length 2:** _____ meters

D. **EXPLAIN** why there can be more than one possible answer for **part C**.

_____

_____

_____

_____

_____

_____

_____

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

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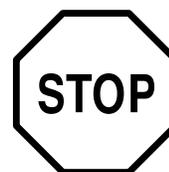
Item-Specific Scoring Guideline

#18 Item Information

Alignment	D-M.3	Depth of Knowledge	3	Mean Score	1.70

Assessment Anchor this item will be reported under:

M03.D-M.3—Geometric Measurement: understand concepts of area and relate area to multiplication and to addition.

Specific Anchor Descriptor addressed by this item:

M03.D-M.3.1—Find the areas of plane figures.

Scoring Guide

Score	In this item, the student . . .
4	Demonstrates a thorough understanding of concepts of area by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of properties of concepts of area by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of properties of concepts of area by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of properties of concepts of area.
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 3.0–3.5 points.
2	Student earns 2.0–2.5 points.
1	Student earns 0.5–1.5 points. OR Student demonstrates minimal understanding of properties of multiplication and the relationship between multiplication and division.
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?
18 (square meters)	

Part B (1 point):

    1 point for correct answer

What?	Why?
$\frac{4}{8}$ or $\frac{2}{4}$ or $\frac{1}{2}$	

Part C (1 point):

    1 point for correct answer

What?	Why?
Answers may vary. The two side lengths given must have a product of 24. **Sample Response:** Length 1: 3 (meters) Length 2: 8 (meters)	

Part D (1 point):

    1 point for correct and complete explanation

| What?	Why?
	Sample Explanation: To find area, you multiply the side lengths. Since there is more than 1 pair of numbers that you can multiply together to get 24, there can be more than one possible answer for part C. **OR equivalent**

STUDENT RESPONSE

Response Score: 4 points

18. Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

Miss Drake's Garden   **Mr. Lee's Garden**

1	4	7	11	15
2	5	8	12	16
3	6	9	13	17
			10	14	18
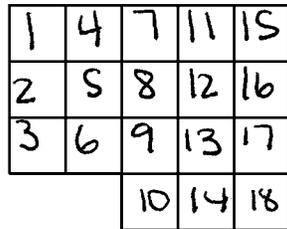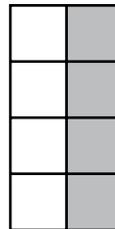
☐ = 1 square meter   ☐ = 1 square meter

A. What is the area, in square meters, of Miss Drake's garden?

PUT your answer in the **BLANK BELOW**.

> The response provides a correct answer.

Answer: _____18_____ square meters

The shaded part of Mr. Lee's garden shows where he plants corn.

B. In what fraction of his garden does Mr. Lee plant corn?

PUT your answer in the **BLANK BELOW**.

> The response provides a correct answer.

Answer: _____ $\frac{4}{8}$ or $\frac{1}{2}$ _____

Go to the next page to finish question 18.

GO ON ⟩

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

Mr. Tillman has a rectangular-shaped garden with an area of 24 square meters.

C. What could be the side lengths, in meters, of Mr. Tillman's garden?

PUT your answer in the **BLANKS BELOW**.

> The response provides two correct lengths that have a product of 24.

Length 1: _____6_____ meters   **Length 2:** _____4_____ meters

D. EXPLAIN why there can be more than one possible answer for **part C**.

there can be more than one possible answer for part C becus if you think of multiplication you know there are muttable ways you can make 24. For example, 6×4=24 You can can do 24×1 or even 8×3.

> The response provides a correct and complete explanation.

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

STOP
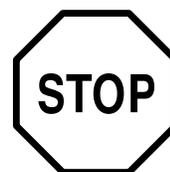
STUDENT RESPONSE

Response Score: 3 points

PARTS A AND B

Question 18
Page 1 of 2

Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

🔍 Enlarge

A. What is the area, in square meters, of Miss Drake's garden?

PUT your answer in the **BLANK BELOW**.

Answer: | 18 | square meters

> The response provides a correct answer.

The shaded part of Mr. Lee's garden shows where he plants corn.

B. In what fraction of his garden does Mr. Lee plant corn?

PUT your answer in the **BLANK BELOW**.

Answer: $\frac{1}{2}$

> The response provides a correct answer.

PARTS C AND D

Question 18
Page 2 of 2

Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

Miss Drake's Garden   Mr. Lee's Garden

☐ = 1 square meter   ☐ = 1 square meter

🔍 Enlarge

Mr. Tillman has a rectangular-shaped garden with an area of 24 square meters.

C. What could be the side lengths, in meters, of Mr. Tillman's garden?

PUT your answers in the **BLANKS BELOW**.

Length 1: 2 meters   **Length 2:** 8 meters

The response provides an incorrect answer (no credit is given for two lengths that do not have a product of 24).

D. **EXPLAIN** why there can be more than one possible answer for part C.

There can be more than one possible answwer for Part C because there are lots of pairs of numbers that make up 24. Some examples are8 and 3, 2 and 12, 4 and 6, and you can also switch the numbers around!

203 / 1000

The response provides a correct and complete explanation.
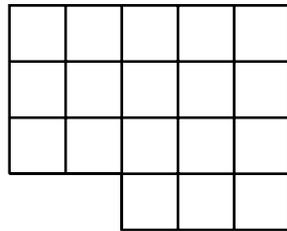
Review/End Test   Pause   Flag   Options   Back   Next

STUDENT RESPONSE

Response Score: 2 points
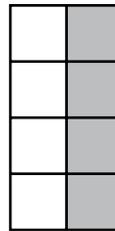
18. Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

Miss Drake's Garden   **Mr. Lee's Garden**

☐ = 1 square meter   ☐ = 1 square meter

A. What is the area, in square meters, of Miss Drake's garden?

PUT your answer in the **BLANK BELOW**.

$4 \times 5 = 20$

5, 10, 15, ㉔

| The response provides an incorrect answer. |

Answer: ___20___ square meters

The shaded part of Mr. Lee's garden shows where he plants corn.

B. In what fraction of his garden does Mr. Lee plant corn?

PUT your answer in the **BLANK BELOW**.

| The response provides a correct answer. |

Answer: ___$\frac{4}{8}$___

Go to the next page to finish question 18.   **GO ON** ▷

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

Mr. Tillman has a rectangular-shaped garden with an area of 24 square meters.

C. What could be the side lengths, in meters, of Mr. Tillman's garden?

PUT your answer in the **BLANKS BELOW**.

> The response provides two correct lengths that have a product of 24.

Length 1: ___4___ meters   **Length 2:** ___6___ meters

D. **EXPLAIN** why there can be more than one possible answer for **part C**.

There can be more than 1 possible answer
for part C because 4×6=24
And 6×4=24 and I did 4×6
because I thought that was easer.

> The response provides an incorrect explanation.

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

STOP

STUDENT RESPONSE
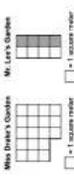
Response Score: 1 point

PARTS A AND B

Question 18
Page 1 of 2

Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

Miss Drake's Garden   Mr. Lee's Garden

☐ = 1 square meter   ☐ = 1 square meter

🔍 Enlarge

A. What is the area, in square meters, of Miss Drake's garden?

PUT your answer in the **BLANK BELOW**.

Answer: | 18 | square meters

The response provides a correct answer.

The shaded part of Mr. Lee's garden shows where he plants corn.

B. In what fraction of his garden does Mr. Lee plant corn?

PUT your answer in the **BLANK BELOW**.

Answer: | 4 |

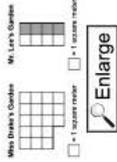The response provides an incorrect answer.

Review/End Test   Pause   Flag   Options   Next

PARTS C AND D

Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

Mr. Tillman has a rectangular-shaped garden with an area of 24 square meters.

C. What could be the side lengths, in meters, of Mr. Tillman's garden?

PUT your answers in the **BLANKS BELOW**.

Length 1: [20] meters   **Length 2:** [4] meters

The response provides an incorrect answer (no credit is given for two lengths that do not have a product of 24).

D. EXPLAIN why there can be more than one possible answer for part C.

There are alot of ways to measure, like 19 + 5 = 24. That is one way, but also 20 + 4 = 24 would work.

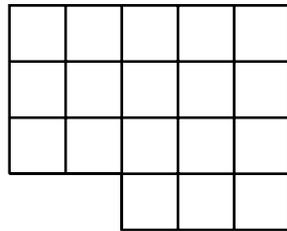The response provides an incorrect explanation.

102 / 1000

STUDENT RESPONSE

Response Score: 0 points

18. Miss Drake and Mr. Lee each have gardens.

Pictures of their gardens are shown below.

Miss Drake's Garden   **Mr. Lee's Garden**
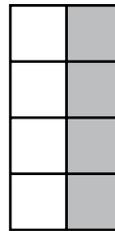
☐ = 1 square meter   ☐ = 1 square meter

A. What is the area, in square meters, of Miss Drake's garden?

PUT your answer in the **BLANK BELOW**.

> The response provides an incorrect answer.

Answer: _____63_____ square meters

The shaded part of Mr. Lee's garden shows where he plants corn.

B. In what fraction of his garden does Mr. Lee plant corn?

PUT your answer in the **BLANK BELOW**.

> The response provides an incorrect answer.

Answer: _____4_____

Go to the next page to finish question 18.   GO ON ▷

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

Mr. Tillman has a rectangular-shaped garden with an area of 24 square meters.

C. What could be the side lengths, in meters, of Mr. Tillman's garden?

PUT your answer in the **BLANKS BELOW**.

> The response provides an incorrect answer (no credit is given for two lengths that do not have a product of 24).

Length 1: _28_ meters   **Length 2:** _56_ meters

D. **EXPLAIN** why there can be more than one possible answer for **part C**.

First I read the question and problem. Then I added 24 and 4 and I got 28 and then I added 28 and 28. Therefore, I know that it was 56.

> The response provides an incorrect explanation.

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

STOP
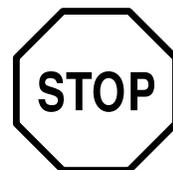
MATHEMATICS—SUMMARY DATA

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.1.1	B	2	17%	38%	31%	14%
2	A-T.1.1.1	C	1	4%	8%	72%	16%
3	A-T.1.1.2 B-O.3.1.1	B	2	15%	55%	15%	15%
4	A-T.1.1.3 A-T.1.1.2	D	2	32%	12%	10%	46%
5	A-F.1.1.5	B	2	18%	56%	20%	6%
6	B-O.1.1.1	B	2	14%	59%	14%	13%
7	B-O.1.2.2 B-O.1.1.2	A	2	56%	16%	19%	9%
8	B-O.2.2.1	A	1	66%	10%	11%	13%
9	B-O.3.1	B	2	24%	56%	14%	6%
10	B-O.3.1.2 D-M.2.1.2	A	2	47%	34%	11%	8%
11	B-O.3.1.6	A	2	53%	14%	12%	21%
12	C-G.1.1	D	1	12%	15%	25%	48%
13	C-G.1.1.2	A	1	65%	21%	8%	6%
14	C-G.1.1.3	D	1	20%	9%	6%	65%
15	D-M.1.1.2	D	2	14%	15%	22%	49%
16	D-M.2.1.3	B	1	22%	46%	21%	11%
17	D-M.4.1	D	1	19%	19%	10%	52%

OPEN-ENDED

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
18	D-M.3	4	3	1.70

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PSSA Grade 3 Mathematics
Item and Scoring Sampler