RIDE Rhode Island Department of Education

Release of Spring 2023 RICAS Test Items

from the

Grade 4 Mathematics Paper-Based Test

June 2023
Rhode Island Department of Education

Overview of Grade 4 Mathematics Test

The spring 2023 grade 4 Mathematics test was a next-generation assessment that was administered in two formats: a computer-based version and a paper-based version. Most students took the computer-based test. The paper-based test was offered as an accommodation for eligible students who were unable to use a computer. More information can be found on the MCAS Test Administration Resources page at www.doe.mass.edu/mcas/admin.html.

Most of the operational items on the grade 4 Mathematics test were the same, regardless of whether a student took the computer-based version or the paper-based version. In places where a technology-enhanced item was used on the computer-based test, an adapted version of the item was created for use on the paper test. These adapted paper items were multiple-choice, multiple-select, or short-answer items that tested the same Mathematics content and assessed the same standard as the technology-enhanced item.

This document displays released items from the paper-based test. Released items from the computer-based test are available on the RICAS Resource Center website at ricas.pearsonsupport.com/released-items.

Test Sessions and Content Overview

The grade 4 Mathematics test was made up of two separate test sessions. Each session included selected-response, short-answer, and constructed-response questions. On the paper-based test, the selected-response questions were multiple-choice items and multiple-select items, in which students select the correct answer(s) from among several answer options.

Standards and Reporting Categories

The grade 4 Mathematics test was based on standards in the five domains for grade 4 in the *Massachusetts Curriculum Framework for Mathematics* (2017). The five domains are listed below.

- Operations and Algebraic Thinking
- Number and Operations in Base Ten
- Number and Operations—Fractions
- Measurement and Data
- Geometry

The *Massachusetts Curriculum Framework for Mathematics* is available on the Department website at www.doe.mass.edu/frameworks/current.html.

Mathematics test results are reported under five MCAS reporting categories, which are identical to the five framework domains listed above.

The tables at the conclusion of this document provide the following information about each released and unreleased operational item: reporting category, standard(s) covered, item type, and item description. The correct answers for released selected-response and short-answer questions are also displayed in the released item table.

Reference Materials and Tools

Each student taking the paper-based version of the grade 4 Mathematics test was provided with a plastic ruler. An image of the ruler is not reproduced in this document.

During both Mathematics test sessions, the use of bilingual word-to-word dictionaries was allowed for current and former English learner students only. No calculators, other reference tools, or materials were allowed.

Grade 4 Mathematics

SESSION 1

This session contains 10 questions.

*You may **not** use a calculator during this session.* 

Directions

Read each question carefully and then answer it as well as you can. You must record all answers in this Test & Answer Booklet.

For some questions, you will mark your answers by filling in the circles in your Test & Answer Booklet. Make sure you darken the circles completely. Do not make any marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

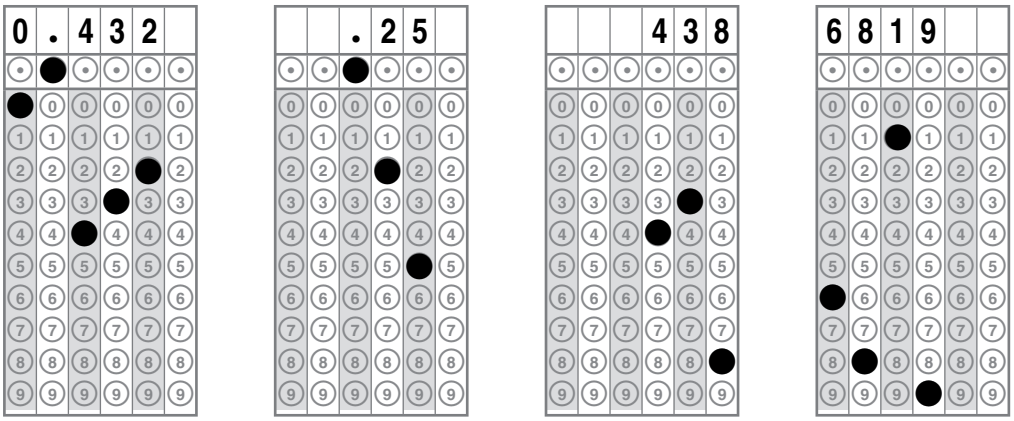
For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

If a question asks you to show or explain your work, you must do so to receive full credit. Write your response in the space provided. Only responses written within the provided space will be scored.

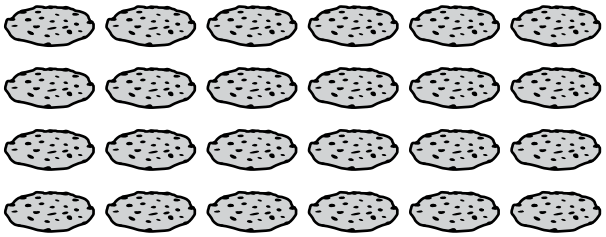
Directions for Completing Questions with Answer Grids

1. Work the question and find an answer.
2. Enter your answer in the answer boxes at the top of the answer grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each answer box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused answer box.
6. If you need to change an answer, be sure to erase your first answer completely.
7. See below for examples of how to correctly complete an answer grid.

EXAMPLES



1 Lily made some cookies, as shown.



Lily made 2 times as many cookies as Tommy made. How many cookies did Tommy make?

Ⓐ 12

Ⓑ 24

Ⓒ 36

Ⓓ 48

2 Diego solved math problems each day for one week.

- On the first day, he solved 10 math problems.
- On the second day, he solved 15 math problems.
- On the third day, he solved 20 math problems.

Each day, Diego continued to solve 5 more math problems than the day before. On which day did he solve 35 math problems?

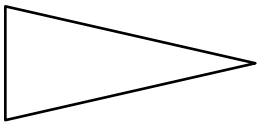
Ⓐ the fourth day

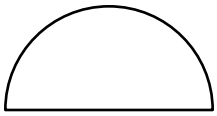
Ⓑ the fifth day

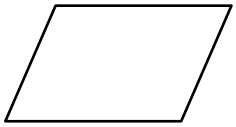
Ⓒ the sixth day

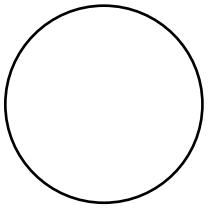
Ⓓ the seventh day

3 Which of the following shapes has **more than** one line of symmetry?

Ⓐ 

Ⓑ 

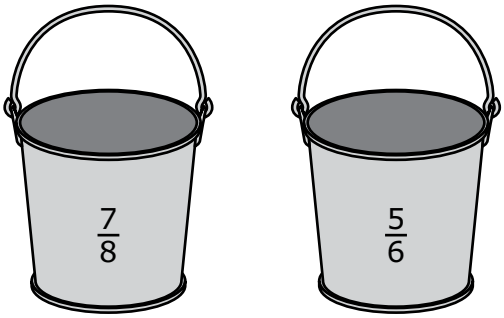
Ⓒ 

Ⓓ 

This question has four parts. Be sure to label each part of your response.

4 Four friends live in different towns. They each placed a bucket outside to collect rainwater on the same night. The four buckets were labeled A, B, C, and D.

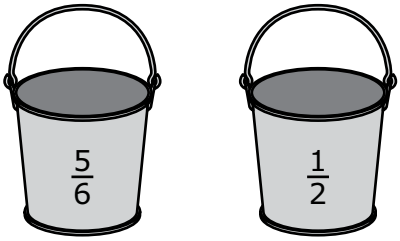
A. Bucket A and Bucket B are the same size. This diagram shows the fraction of each bucket that was filled with rainwater.



Bucket A Bucket B

Write a number sentence using >, <, or = to compare the fraction of Bucket A that was filled to the fraction of Bucket B that was filled. Show or explain how you got your answer.

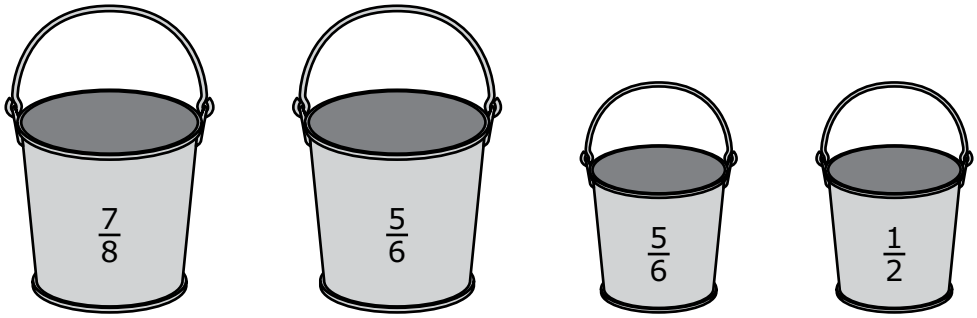
B. Bucket C and Bucket D are the same size. This diagram shows the fraction of each bucket that was filled with rainwater.



Bucket C Bucket D

Which bucket, Bucket C or Bucket D, was filled with more rainwater? Explain how you got your answer.

C. This diagram shows all of the friends' buckets and the fraction of each bucket that was filled with rainwater.



One of the friends says that Bucket B and Bucket C were filled with the same amount of rainwater since $\frac{5}{6}$ of each bucket was filled with rainwater.

Is the friend correct? Explain your reasoning.

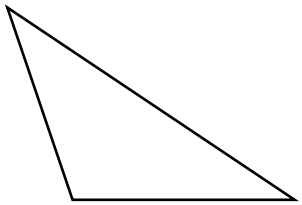
D. A weatherman in another town says that his town received **less than** $\frac{1}{2}$ inch of rainwater.

Write a fraction that represents the amount of rainwater, in inches, this town could have received. Explain how you know your answer is correct.

Write your answers on the next page.

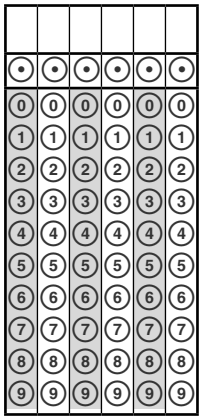
4

5 A triangle is shown.



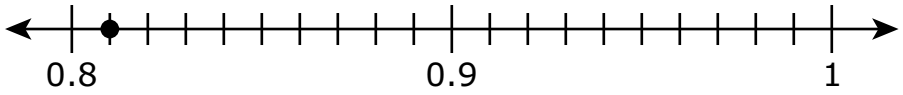
What is the total number of acute angles the triangle appears to have?

Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

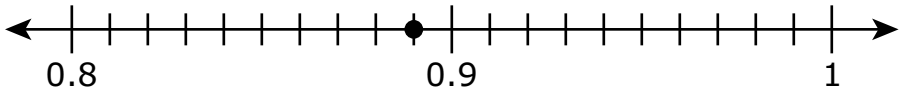


6 Which of these number lines shows a point that represents the location of $\frac{91}{100}$?

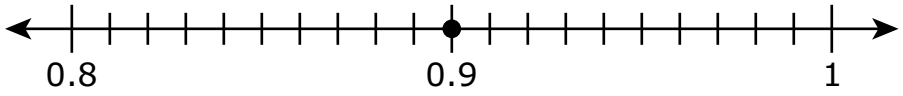
Ⓐ



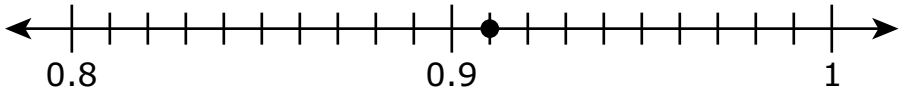
Ⓑ



Ⓒ

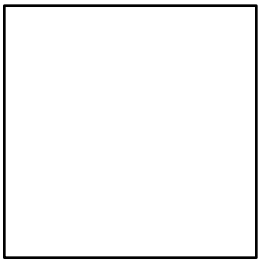


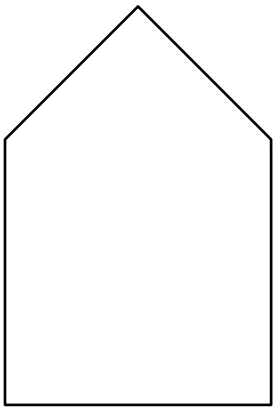
Ⓓ

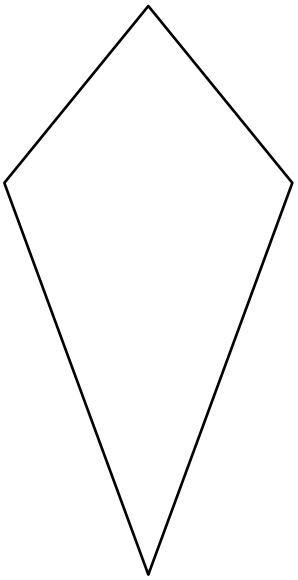


7 Which of these shapes appears to be a quadrilateral with perpendicular sides?

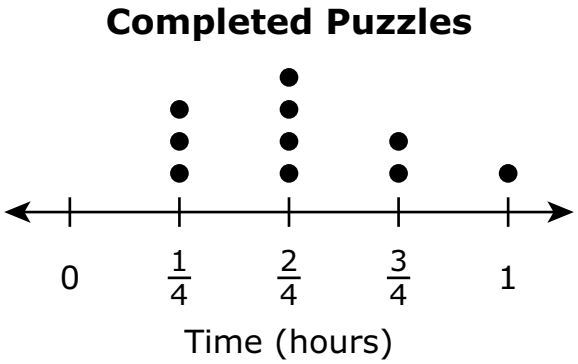
Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

8 This dot plot shows the amounts of time, in hours, it took a student to complete ten different puzzles last week.



The three puzzles that took the greatest amount of time were completed by the student on Saturday.

What was the total amount of time, in hours, it took the student to complete the three puzzles on Saturday?

Ⓐ $2\frac{1}{2}$ hours

Ⓑ 2 hours

Ⓒ $\frac{3}{4}$ hour

Ⓓ $\frac{1}{4}$ hour

9 An expression is shown.

$$372{,}068 - 8{,}329$$

Which of these numbers is the difference of the expression?

Ⓐ 363,739

Ⓑ 364,341

Ⓒ 364,749

Ⓓ 366,341

10 Which of these is the measure of an angle that turns through $\frac{1}{3}$ of a circle?

Ⓐ 45°

Ⓑ 90°

Ⓒ 120°

Ⓓ 180°

Grade 4 Mathematics

SESSION 2

This session contains 10 questions.

*You may **not** use a calculator during this session.*

Directions

Read each question carefully and then answer it as well as you can. You must record all answers in this Test & Answer Booklet.

For some questions, you will mark your answers by filling in the circles in your Test & Answer Booklet. Make sure you darken the circles completely. Do not make any marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely.

For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

If a question asks you to show or explain your work, you must do so to receive full credit. Write your response in the space provided. Only responses written within the provided space will be scored.

11 Which of these shows three comparison statements that are all true?

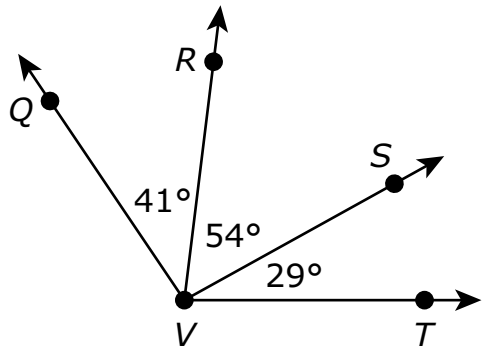
Ⓐ
$$0.54 > 0.65$$
$$0.6 < 0.52$$
$$0.76 > 0.78$$

Ⓑ
$$0.54 > 0.52$$
$$0.6 < 0.78$$
$$0.76 > 0.65$$

Ⓒ
$$0.54 > 0.52$$
$$0.6 < 0.65$$
$$0.76 > 0.78$$

Ⓓ
$$0.54 > 0.78$$
$$0.6 < 0.52$$
$$0.76 > 0.65$$

12 Some angle measures are shown in this diagram.



- Angle *QVR* has a measure of 41°.
- Angle *RVS* has a measure of 54°.
- Angle *SVT* has a measure of 29°.

Which of the following is the measure, in degrees, of angle *QVT*?

Ⓐ 124°

Ⓑ 114°

Ⓒ 95°

Ⓓ 83°

This question has three parts. Be sure to label each part of your response.

13 A doctor works in her office 5 days each week. Each day she works, she drives a total of 19 miles to and from her office.

A. What is the total distance, in miles, the doctor drives to and from her office each week? Show or explain how you got your answer.

B. The doctor worked 48 weeks last year.

What is the total distance, in miles, she drove to and from her office last year? Show or explain how you got your answer.

C. The doctor worked the same number of weeks each year for the last 7 years.

What is the total distance, in miles, the doctor drove to and from her office over the last 7 years? Show or explain how you got your answer.

Write your answers on the next page.

13

14 A metal bar has a mass of 5 kilograms.

Which of these is the mass, in **grams**, of the bar?

Ⓐ 50 grams

Ⓑ 500 grams

Ⓒ 5,000 grams

Ⓓ 50,000 grams

15 A rectangle has a width of 5 inches and a length of 4 inches.

Which of these equations shows the perimeter, in inches, of the rectangle?

Ⓐ $5 + 4 = 9$

Ⓑ $5 \times 4 = 20$

Ⓒ $2 + 5 \times 2 + 4 = 16$

Ⓓ $2 \times 5 + 2 \times 4 = 18$

16 Which of these statements about rounding the number 44,285 are true?

Select the **three** correct answers.

Ⓐ 44,285 rounded to the nearest **hundred** is 44,200.

Ⓑ 44,285 rounded to the nearest **hundred** is 44,300.

Ⓒ 44,285 rounded to the nearest **thousand** is 44,000.

Ⓓ 44,285 rounded to the nearest **thousand** is 45,000.

Ⓔ 44,285 rounded to the nearest **ten thousand** is 40,000.

Ⓕ 44,285 rounded to the nearest **ten thousand** is 50,000.

17 A group of friends are going to eat lunch in the cafeteria.

- At the cafeteria, a boxed lunch costs $7.
- Each friend in the group will buy a boxed lunch.

Which of these could be the **total** cost to buy boxed lunches for all the friends in the group?

Ⓐ $62

Ⓑ $84

Ⓒ $93

Ⓓ $97

This question has two parts.

18 A teacher is using multiplication to compare numbers.

Part A

The teacher says that 14 is 7 times as many as 2.

Which multiplication equation shows the teacher's comparison?

Ⓐ $14 = 7 \times 2$

Ⓑ $7 = 14 \times 2$

Ⓒ $2 = 7 \times 14$

Ⓓ $2 = 14 \times 7$

Part B

The teacher uses a comparison to describe this equation.

$$30 = 6 \times 5$$

Which of these could be the comparison the teacher used?

Ⓐ The number 5 is 6 times as many as the number 30.

Ⓑ The number 6 is 6 times as many as the number 30

Ⓒ The number 30 is 6 times as many as the number 5.

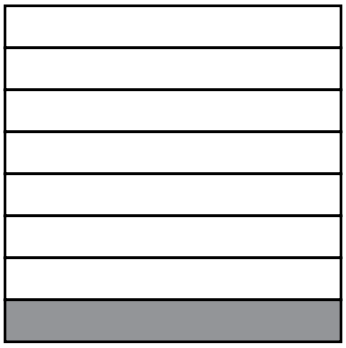
Ⓓ The number 30 is 6 times as many as the number 6.

19 Two friends bought a chocolate bar.

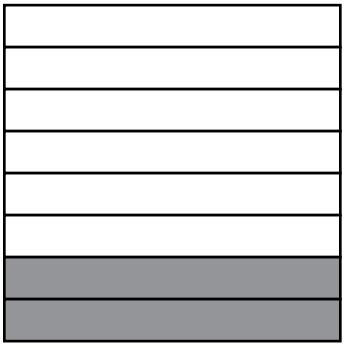
- One friend ate $\frac{2}{8}$ of the chocolate bar.
- The other friend ate $\frac{1}{8}$ of the chocolate bar.

In which fraction model does the shaded part represent the fraction of the chocolate bar that **remains**?

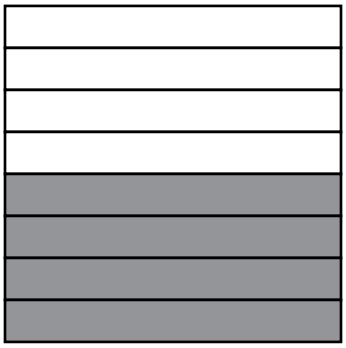
Ⓐ



Ⓑ



Ⓒ



Ⓓ

20 A market sells beans in bags. Each bag has $\frac{3}{4}$ pound of beans. How many pounds of beans are in 8 bags altogether?

Ⓐ $2\frac{3}{4}$

Ⓑ 6

Ⓒ $8\frac{3}{4}$

Ⓓ 15

Grade 4 Mathematics
Spring 2023 Released Operational Items

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
1	4	*Operations and Algebraic Thinking*	4.OA.A.2	SR	Solve a word problem involving a multiplicative comparison.	A
2	4	*Operations and Algebraic Thinking*	4.OA.C.5	SR	Solve a word problem by determining additional terms in a given pattern.	C
3	5	*Geometry*	4.G.A.3	SR	Identify a given shape that has a specified number of lines of symmetry.	D
4	6–8	*Number and Operations—Fractions*	4.NF.A.2	CR	Write a fraction comparison using symbols, compare fractions with different denominators, and critique the reasoning of others about different-sized wholes in a word problem.	
5	9	*Geometry*	4.G.A.1	SA	Identify the number of acute angles in a given figure.	2
6	10	*Number and Operations—Fractions*	4.NF.C.6	SR	Convert a given fraction, with a denominator of 100, to a decimal and identify the number line with a point that represents the location of the decimal.	D
7	11	*Geometry*	4.G.A.2	SR	Determine which given shape is a quadrilateral with perpendicular sides.	B
8	12	*Measurement and Data*	4.MD.B.4	SR	Solve a word problem with addition of whole numbers and fractions by using data from a dot plot.	A
9	13	*Number and Operations in Base Ten*	4.NBT.B.4	SR	Determine the difference of a six-digit number and a four-digit number.	A
10	13	*Measurement and Data*	4.MD.C.5	SR	Determine the measure of an angle that turns through a given fraction of a circle.	C
11	16	*Number and Operations—Fractions*	4.NF.C.7	SR	Identify correct comparison statements of two decimals to hundredths and tenths using the symbols > or <.	B
12	17	*Measurement and Data*	4.MD.C.7	SR	Determine the angle measure of a larger angle given the measures of the individual angles that make up the larger angle.	A
13	18–19	*Number and Operations in Base Ten*	4.NBT.B.5	CR	Solve word problems by multiplying whole numbers: two digits by one digit, two digits by two digits, and four digits by one digit.	
14	20	*Measurement and Data*	4.MD.A.1	SR	Convert kilograms to grams.	C
15	20	*Measurement and Data*	4.MD.A.3	SR	Select the equation that shows how to find the perimeter of a rectangle given the length and width.	D
16	20	*Number and Operations in Base Ten*	4.NBT.A.3	SR	Round a multi-digit whole number to the nearest hundred, thousand, and ten thousand.	B,C,E
17	21	*Operations and Algebraic Thinking*	4.OA.B.4	SR	Solve a word problem by identifying a multiple of a given whole number.	B
18	22	*Operations and Algebraic Thinking*	4.OA.A.1	SR	Determine which multiplication equation represents a given word comparison and which word comparison represents a given multiplication equation.	A;C
19	23	*Number and Operations—Fractions*	4.NF.B.3	SR	Determine which model represents the answer to a real-world problem involving addition and subtraction of fractions with like denominators.	D
20	24	*Number and Operations—Fractions*	4.NF.B.4	SR	Solve a word problem by multiplying a fraction by a whole number.	B

* Mathematics item types are: selected-response (SR), short-answer (SA), and constructed-response (CR).

** Answers are provided here for selected-response and short-answer items only. Sample responses and scoring guidelines for any constructed-response items will be posted to the Department's website later this year.

Grade 4 Mathematics
Spring 2023 Unreleased Operational Items

PBT Item No.	Reporting Category	Standard	Item Type*	Item Description
21	*Geometry*	4.G.A.1	SR	Identify which visual representation of an angle is an obtuse angle.
22	*Number and Operations in Base Ten*	4.NBT.B.6	SR	Determine the whole number quotient of a four-digit dividend and a one-digit divisor.
23	*Number and Operations—Fractions*	4.NF.A.1	SR	Identify the fraction model that represents an equivalent fraction of a given fraction with a denominator of 100.
24	*Measurement and Data*	4.MD.C.6	SR	Determine measures of angles using a protractor.
25	*Number and Operations—Fractions*	4.NF.C.7	SR	Determine which number sentences with the symbols <, >, or = correctly compare two decimals to hundredths.
26	*Number and Operations—Fractions*	4.NF.B.3	SR	Identify the addition expressions with fractions and mixed numbers that are equivalent to a given mixed number sum.
27	*Operations and Algebraic Thinking*	4.OA.A.3	CR	Solve multi-step word problems using addition, multiplication, and division of whole numbers and by writing and solving an equation.
28	*Number and Operations—Fractions*	4.NF.B.4	SR	Identify the expression that is equivalent to the product of a fraction multiplied by a whole number.
29	*Number and Operations in Base Ten*	4.NBT.A.2	SR	Match numbers written in expanded form to their equivalent numbers written in word form and compare numbers written in word form to a number in standard form.
30	*Operations and Algebraic Thinking*	4.OA.A.1	SR	Determine which verbal statement of multiplicative comparison represents a given equation in a word problem.
31	*Number and Operations—Fractions*	4.NF.A.1	SR	Determine which fraction is equivalent to a given fraction using a picture.
32	*Geometry*	4.G.A.2	SR	Identify shapes that contain right angles.
33	*Number and Operations in Base Ten*	4.NBT.A.1	SR	Determine the relationship between digits in multi-digit whole numbers.
34	*Number and Operations—Fractions*	4.NF.C.6	SA	Write a fraction with a denominator of 100 as a decimal.
35	*Measurement and Data*	4.MD.A.2	CR	Use a ruler to measure given objects to the nearest centimeter and solve word problems involving multiplication and addition of measurements and the conversion of meters to centimeters.
36	*Measurement and Data*	4.MD.C.5	SR	Identify the mathematical name for a given definition.
37	*Number and Operations—Fractions*	4.NF.C.5	SR	Determine which fraction is equivalent to a given fraction with a denominator of 100.
38	*Number and Operations in Base Ten*	4.NBT.A.2	SR	Put four six-digit numbers in order from least to greatest.
39	*Operations and Algebraic Thinking*	4.OA.B.4	SR	Select the factor pairs of a given two-digit number.

PBT Item No.	Reporting Category	Standard	Item Type*	Item Description
40	*Number and Operations—Fractions*	4.NF.C.5	SR	Interpret two given fraction models, one in tenths and one in hundredths, and identify the equivalent addition expression using fractions with denominators of 100.

* Mathematics item types are: selected-response (SR), short-answer (SA), and constructed-response (CR).