RIDE Rhode Island Department of Education

Release of Spring 2025 RICAS Test Items

from the

Grade 7 Mathematics Paper-Based Test

July 2025
Rhode Island Department of Education

This document was prepared by the
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Overview of Grade 7 Mathematics Test

The spring 2025 grade 7 Mathematics test 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 7 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.onlinehelp.cognia.org/released-items/.

Test Sessions and Content Overview

The grade 7 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 7 Mathematics test was based on standards in the five domains for grade 7 in the *Massachusetts Curriculum Framework for Mathematics* (2017). The five domains are listed below.

- Ratios and Proportional Relationships
- The Number System
- Expressions and Equations
- Geometry
- Statistics and Probability

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 grade 7 Mathematics test was provided with a ruler and a grade 7 Mathematics Reference Sheet. A copy of the reference sheet can be found on the next page of this document.

During Session 2, each student had sole access to a calculator. Calculator use was not allowed during Session 1.

During both Mathematics test sessions, the use of authorized bilingual word-to-word dictionaries and glossaries was allowed for students who are currently or were ever reported as English learners. No other reference tools or materials were allowed.

RIDE Rhode Island Department of Education

Rhode Island Comprehensive Assessment System
Grade 7 Mathematics Reference Sheet

CONVERSIONS

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon ≈ 3.785 liters
1 liter ≈ 0.264 gallon
1 liter = 1000 cubic centimeters

1 inch = 2.54 centimeters
1 meter ≈ 39.37 inches
1 mile = 5280 feet
1 mile = 1760 yards
1 mile ≈ 1.609 kilometers
1 kilometer ≈ 0.62 mile

1 pound = 16 ounces
1 pound ≈ 0.454 kilogram
1 kilogram ≈ 2.2 pounds
1 ton = 2000 pounds

AREA (*A*) FORMULAS

square . . . . . $A = s^2$

rectangle . . . . . $A = bh$

OR

$A = lw$

parallelogram . . $A = bh$

triangle . . . . . $A = \frac{1}{2}bh$

trapezoid . . . . . $A = \frac{1}{2}h(b_1 + b_2)$

circle . . . . . $A = \pi r^2$

CIRCLE FORMULAS

area . . . . . $A = \pi r^2$

circumference . . $C = 2\pi r$

OR

$C = \pi d$

VOLUME (*V*) FORMULAS

cube . . . . . $V = s^3$

(s = length of an edge)

right prism . . . . . $V = Bh$

TOTAL SURFACE AREA (*SA*) FORMULAS

right rectangular prism . . $SA = 2(lw) + 2(hw) + 2(lh)$

Grade 7 Mathematics

SESSION 1

This session contains 10 questions.

You may use your reference sheet during this session.
*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.

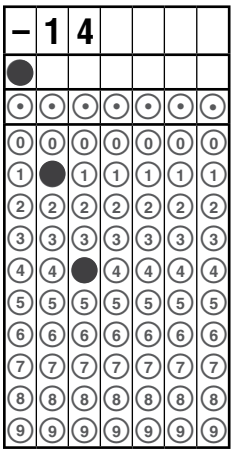
For other questions, you will need to fill in an answer grid. Directions for completing questions with answer grids are provided on the next page.

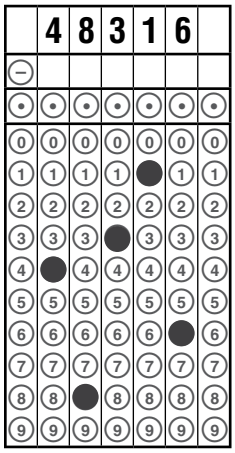
If a question asks you to show or explain your work, you must do so to receive full credit. Write your response in the space provided. Only responses written within the provided space will be scored.

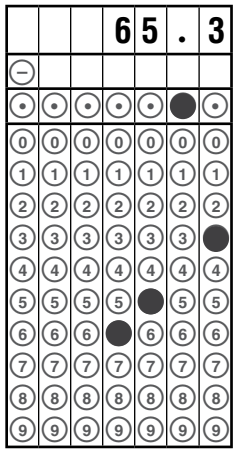
Directions for Completing Questions with Answer Grids

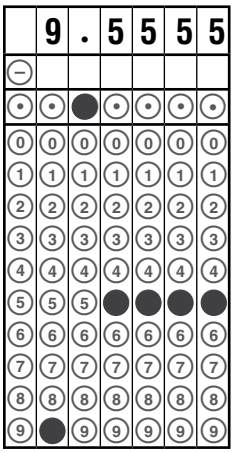
1. Work the question and find an answer.
2. Enter your answer in the answer boxes at the top of the answer grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each answer box, fill in the circle that matches the number or symbol you wrote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

Examples

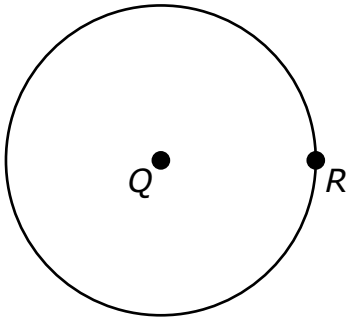








1 A student draws a circle with a radius of 4 inches. The student labels the center of the circle as point *Q* and labels point *R* on the circle, as shown.



What is the length, in inches, of the distance from point *Q* to point *R*?

Ⓐ 64

Ⓑ 16

Ⓒ 8

Ⓓ 4

2 Which of the following tables shows a proportional relationship between two quantities?

Ⓐ

Ounces	Cents
10	9
7	7
4	5
1	3

Ⓑ

Pounds	Dollars
5	3
8	6
10	8
13	11

Ⓒ

Hours	Wages ($)
8	64
16	128
32	512
40	640

Ⓓ

Minutes	Pages Read
5	6
10	12
25	30
50	60

3 Consider this expression.

$$-0.25 \div 0.50$$

Which of the following is equivalent to the expression?

Ⓐ 0.50

Ⓑ 0.050

Ⓒ –0.050

Ⓓ –0.50

4 The first number in a pattern is 1,024. Each following number in the pattern is found by dividing the previous number by 4.

What is the sixth number in the pattern?

Ⓐ 0.25

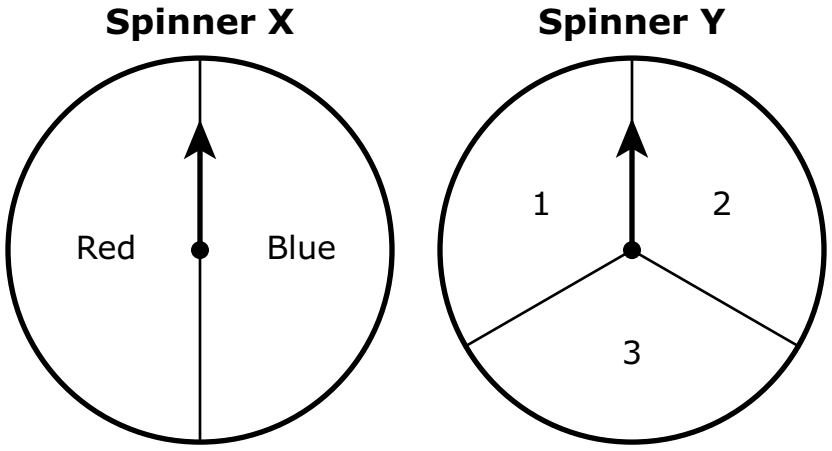
Ⓑ 1

Ⓒ 4

Ⓓ 16

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

5 A student designed two spinners, Spinner X and Spinner Y. Each of the spinners is divided into congruent sections and labeled, as shown.



The student will spin the arrow on each spinner one time.

A. What is the probability that the arrow on Spinner X will stop on a section labeled "Red"?

B. List all of the possible outcomes that can occur when the arrow on Spinner X and the arrow on Spinner Y are each spun one time.

C. What is the probability that the arrow on Spinner X will stop on a section labeled "Red" **and** the arrow on Spinner Y will stop on a section labeled with an odd number? Show or explain how you got your answer.

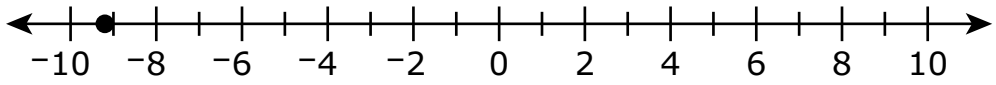
D. What is the probability that the arrow on Spinner X will stop on a section labeled "Red" **or** the arrow on Spinner Y will stop on a section labeled with an odd number? Show or explain how you got your answer.

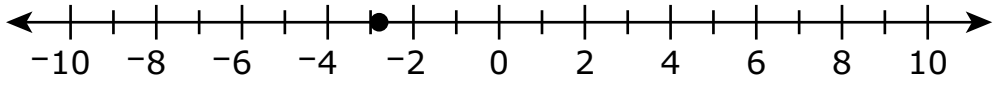
5

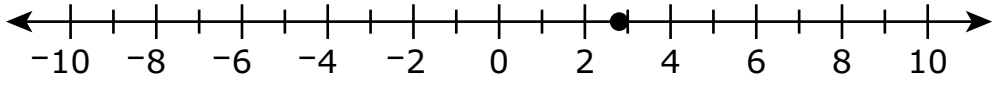
6 Consider this equation.

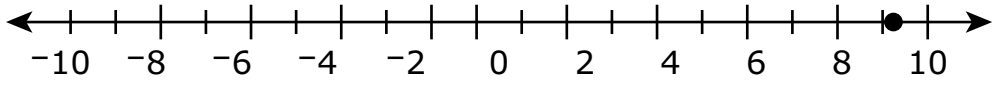
$$x = 3.2 - 6$$

Which of the following number lines shows a point that represents the value of x?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

This question has two parts.

7 Four ingredients were used to make 4.5 cups of trail mix. Of the 4.5 cups of trail mix,

- 25% is peanuts,
- $\frac{1}{3}$ is raisins,
- $\frac{2}{9}$ is almonds, and
- the rest is chocolate chips.

Part A

What was the amount of peanuts, in cups, used to make the trail mix?

Ⓐ $\frac{3}{2}$

Ⓑ $\frac{9}{5}$

Ⓒ $\frac{9}{8}$

Ⓓ $\frac{17}{4}$

Part B

Which of the following statements about the ingredients in the trail mix is true?

Ⓐ In the 4.5 cups of trail mix, there are $1\frac{1}{2}$ cups of raisins and $\frac{1}{2}$ cup of almonds.

Ⓑ In the 4.5 cups of trail mix, there are $1\frac{1}{2}$ cups of raisins and 1 cup of almonds.

Ⓒ In the 4.5 cups of trail mix, there are 1 cup of almonds and $\frac{2}{3}$ cup of chocolate chips.

Ⓓ In the 4.5 cups of trail mix, there are $\frac{1}{2}$ cup of almonds and 1 cup of chocolate chips.

8 A faucet leaks $\frac{5}{9}$ liter of water in $\frac{2}{5}$ hour.

At this rate, what will be the amount of water, in liters, that the faucet will leak in 1 hour?

Ⓐ $\frac{2}{9}$

Ⓑ $\frac{7}{45}$

Ⓒ $\frac{43}{45}$

Ⓓ $1\frac{7}{18}$

9 Last week, Kateryna jogged $1\frac{3}{4}$ miles each day for three days. This table shows the time, in hours, she spent jogging each day.

Time Spent Jogging

Day	Time (hours)
Monday	$\frac{1}{3}$
Wednesday	$\frac{5}{12}$
Friday	$\frac{1}{2}$

Which of the following sentences about the rate, in miles per hour (mph), that Kateryna jogged each day are true?

Select the **three** correct answers.

Ⓐ On Monday, Kateryna jogged at a rate of $4\frac{1}{5}$ mph.

Ⓑ On Monday, Kateryna jogged at a rate of $5\frac{1}{4}$ mph.

Ⓒ On Wednesday, Kateryna jogged at a rate of $3\frac{1}{2}$ mph.

Ⓓ On Wednesday, Kateryna jogged at a rate of $4\frac{1}{5}$ mph.

Ⓔ On Friday, Kateryna jogged at a rate of $3\frac{1}{2}$ mph.

Ⓕ On Friday, Kateryna jogged at a rate of $5\frac{1}{4}$ mph.

10 Which of the following expressions are equivalent to $-\frac{7}{6}$?

Select the **three** correct answers.

Ⓐ $\frac{-7}{-6}$

Ⓑ $\frac{-7}{6}$

Ⓒ $\frac{7}{-6}$

Ⓓ $-\frac{6}{7}$

Ⓔ $1\left(\frac{7}{6}\right)$

Ⓕ $-1\left(\frac{7}{6}\right)$

Grade 7 Mathematics

SESSION 2

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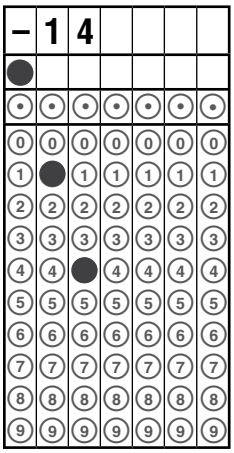
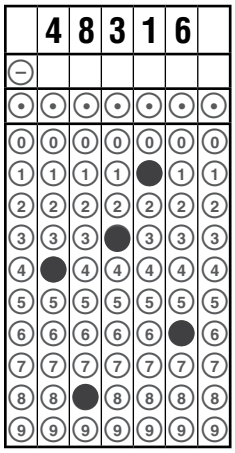
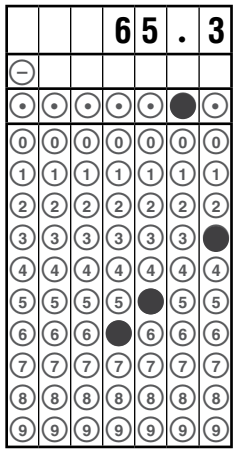
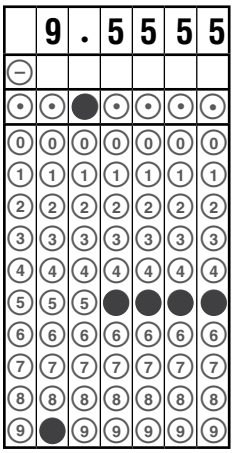
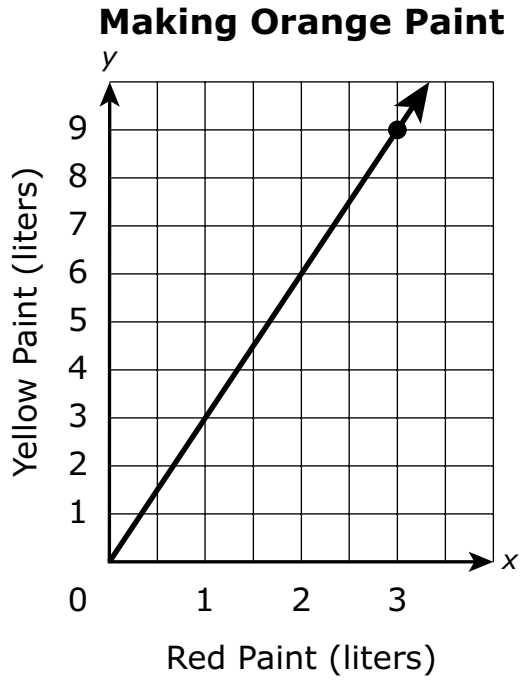








11 This graph shows the relationship between x, the amount of red paint, and y, the amount of yellow paint, needed to make orange paint.



Based on the graph, which statement correctly describes the meaning of the point (3, 9) in the context of making orange paint?

Ⓐ To make orange paint, 9 liters of yellow paint per liter of red paint are needed.

Ⓑ To make orange paint, 3 liters of red paint per liter of yellow paint are needed.

Ⓒ To make orange paint, 9 liters of yellow paint per 3 liters of red paint are needed.

Ⓓ To make orange paint, 3 liters of yellow paint per 9 liters of red paint are needed.

12 Last year, a computer was bought for x dollars. The computer decreased in value and now has a value of $0.65x$ dollars.

Which of the following expressions represents the current value, in dollars, of the computer?

Ⓐ $x + 0.35x$

Ⓑ $x - 0.35x$

Ⓒ $x + 0.65x$

Ⓓ $x - 0.65x$

13 A student wants to determine the average price of a gallon of gas in his state. He will survey gas stations to collect data.

Which of the following samples should he survey to collect the **best** representative data?

Ⓐ 20 randomly selected gas stations across the state

Ⓑ 20 randomly selected gas stations closest to the student

Ⓒ 20 randomly selected gas stations from three cities in the state

Ⓓ 20 randomly selected gas stations that sell the same brand of gas

14 Consider this expression.

$$-8x + 2$$

Which of the following is equivalent to the expression?

Ⓐ $3x + (5x - 2)$

Ⓑ $2(-4x + 1)$

Ⓒ $-4(2x - 1)$

Ⓓ $-4(-2x + 1)$

15 A party planner bought 30 meters of ribbon to make bows. She uses 20 centimeters of ribbon to make 1 bow.

What is the total number of bows the party planner can make with 30 meters of ribbon?

Ⓐ 15

Ⓑ 150

Ⓒ 1,500

Ⓓ 15,000

16 Devon must collect no more than 26 ounces of water samples for a science fair project.

- Devon already has one water sample of 3.50 ounces.
- This week, Devon will collect additional water samples of 2.25 ounces each.

Which of the following inequalities can be used to find x, the possible number of water samples Devon will collect this week?

Ⓐ $3.50x + 2.25 \leq 26$

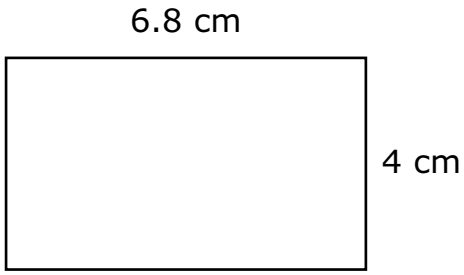
Ⓑ $3.50x + 2.25 \geq 26$

Ⓒ $2.25x + 3.50 \leq 26$

Ⓓ $2.25x + 3.50 \geq 26$

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

17 An architect created a scale drawing of a classroom floor. Her scale drawing is in the shape of a rectangle that has a length of 6.8 centimeters and a width of 4 centimeters, as shown in this diagram.

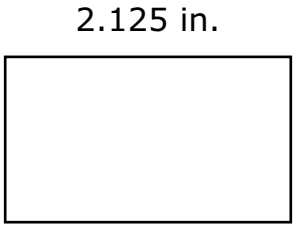


Scale
1 cm = 5 ft.

A. Based on the diagram, what is the length, in feet, of the actual classroom floor? Show or explain how you got your answer.

B. Based on the diagram, what is the area, in square feet, of the actual classroom floor? Show or explain how you got your answer.

C. The architect updated her scale drawing of the classroom floor using a different scale. The new scale drawing has a length of 2.125 inches, as shown in this diagram.



What could be the scale the architect used in her new scale drawing? Show or explain how you got your answer.

D. Based on your answer to Part C, what is the width, in inches, of the new scale drawing of the classroom floor? Show or explain how you got your answer.

17

18 A researcher surveyed a random sample of 500 college students to see if they prefer reading a print magazine or a digital magazine. This table shows the results of the survey.

Survey Results

Magazine Preference	Number of Responses
print	220
digital	200
no preference	80

There are a total of 7,500 students in the college.

Based on the results in the table, what is the **best** estimate of the total number of students in the college who would report that they prefer digital magazines?

Ⓐ 2,000

Ⓑ 2,500

Ⓒ 3,000

Ⓓ 5,000

19 A jar of beads is being sold at a store.

- The jar contains 35 beads.
- $\frac{2}{5}$ of the beads in the jar are blue.
- All the other beads in the jar are green.

What percentage of the beads in the jar are green?

Ⓐ 14%

Ⓑ 20%

Ⓒ 40%

Ⓓ 60%

20 Lucas makes a dress and a jacket to sell. He will sell each piece of clothing for 40% more than the cost, in dollars, of the materials he bought to make the clothing.

Which of the following sentences are true?

Choose the **two** correct answers.

Ⓐ It cost Lucas $22 to make the dress, so he will sell the dress for $30.80.

Ⓑ It cost Lucas $22 to make the dress, so he will sell the dress for $62.00.

Ⓒ Lucas will sell the jacket for $44.80, because it cost him $32.00 to make the jacket.

Ⓓ Lucas will sell the jacket for $44.80, because it cost him $40.80 to make the jacket.

Ⓔ Lucas will sell the jacket for $44.80, because it cost him $43.08 to make the jacket.

Grade 7 Mathematics
Spring 2025 Released Operational Items

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer (SR)**
1	5	*Geometry*	7.G.B.4	SR	Determine the distance between the center of a circle and a point drawn on the circle, given its radius.	D
2	6	*Ratios and Proportional Relationships*	7.RP.A.2	SR	Determine which table represents a proportional relationship between two quantities.	D
3	7	*The Number System*	7.NS.A.2	SR	Determine which expression is equivalent to a given expression.	D
4	7	*Expressions and Equations*	7.EE.B.4	SR	Extend a simple pattern when given a rule.	B
5	8–9	*Statistics and Probability*	7.SP.C.8	CR	Find the probability of a compound event using a tree diagram and simulation, and make an organized list based on the simulation.	
6	10	*The Number System*	7.NS.A.1	SR	Determine which number line shows the solution of an equation involving subtraction of two rational numbers.	B
7	11	*Expressions and Equations*	7.EE.B.3	SR	Solve a multi-step, real-world problem involving fractions, decimals, and percentages.	C;B
8	12	*Ratios and Proportional Relationships*	7.RP.A.1	SR	Determine the unit rate associated with a given ratio of fractions in a real-world context.	D
9	13	*Ratios and Proportional Relationships*	7.RP.A.1	SR	Determine the unit rates associated with ratios of fractions in a real-world context.	B,D,E
10	14	*The Number System*	7.NS.A.2	SR	Determine which expressions are equivalent to a given expression.	B,C,F
11	17	*Ratios and Proportional Relationships*	7.RP.A.2	SR	Interpret the proportional relationship shown in a graph.	C
12	18	*Expressions and Equations*	7.EE.A.2	SR	Determine which expression represents a given real-world context.	B
13	18	*Statistics and Probability*	7.SP.A.1	SR	Determine which sampling strategy will produce a sample that is valid to represent a specific population.	A
14	18	*Expressions and Equations*	7.EE.A.1	SR	Determine which expression is equivalent to a given expression.	B
15	19	*The Number System*	7.NS.A.3	SR	Solve a multi-step, real-world problem by converting units.	B
16	19	*Expressions and Equations*	7.EE.B.4	SR	Determine which inequality in the form px plus q less than or equal to r can be used to represent a problem.	C
17	20–21	*Geometry*	7.G.A.1	CR	Identify and apply a scale to determine the dimensions and areas of rectangles given in a real-world context.	
18	22	*Statistics and Probability*	7.SP.A.2	SR	Given a random sample from a population, predict the distribution of the responses in a different sample.	C
19	23	*The Number System*	7.NS.A.3	SR	Solve a real-world problem involving the four operations.	D
20	23	*Ratios and Proportional Relationships*	7.RP.A.3	SR	Solve a multi-step, real-world problem involving percent increase.	A,C

* 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 7 Mathematics
Spring 2025 Unreleased Operational Items

PBT Item No.	Reporting Category	Standard	Item Type*	Item Description
21	*The Number System*	7.NS.A.2	SR	Determine whether the products of positive and negative rational numbers have positive or negative values.
22	*Expressions and Equations*	7.EE.A.1	SR	Determine which expression is equivalent to a given expression.
23	*The Number System*	7.NS.A.1	CR	Apply properties of operations to add and subtract rational numbers in a mathematical context.
24	*Ratios and Proportional Relationships*	7.RP.A.2	SR	Determine the constant of proportionality given a table of values.
25	*Expressions and Equations*	7.EE.A.2	SR	Determine which equivalent expression can be used to represent a real-world problem.
26	*Ratios and Proportional Relationships*	7.RP.A.1	SR	Determine the unit rate associated with ratios of fractions and use the unit rate to solve a real-world problem.
27	*Ratios and Proportional Relationships*	7.RP.A.3	SR	Use proportional and ratio reasoning to solve a problem using distance as a context.
28	*Statistics and Probability*	7.SP.B.3	SR	Express the difference between two means in terms of the mean absolute deviation.
29	*Expressions and Equations*	7.EE.A.2	SR	Determine which expressions could represent a given real-world context.
30	*The Number System*	7.NS.A.3	SR	Determine which expression is equivalent to a given expression.
31	*Statistics and Probability*	7.SP.C.5	SR	Determine how likely an event is to occur given the probability of the event.
32	*Statistics and Probability*	7.SP.C.6	SR	Determine the probability of a chance event and predict the approximate relative frequency of that event given the probability.
33	*Expressions and Equations*	7.EE.B.3	CR	Solve multi-step, real-life problems posed with rational numbers including fractions, percents, and integers.
34	*Geometry*	7.G.B.5	SR	Determine which equations represent a multi-step problem by using facts about supplementary and complementary angles.
35	*Statistics and Probability*	7.SP.B.4	SR	Given two numerical data sets in a double box plot, compare the medians and the interquartile ranges of the data sets.
36	*Ratios and Proportional Relationships*	7.RP.A.2	SR	Interpret the proportional relationship shown in a graph, use it to create an equation, and solve a problem.
37	*Geometry*	7.G.A.3	SR	Determine which two-dimensional shape will result from slicing a right rectangular pyramid, given the direction of the slice.
38	*Geometry*	7.G.A.2	SR	Determine whether each given set of angle measurements could be the angle measures of a triangle.
39	*Statistics and Probability*	7.SP.C.7	SR	Determine the probability of events using a uniform probability model.
40	*Ratios and Proportional Relationships*	7.RP.A.3	SR	Solve a multi-step, real-world problem involving percent increase.

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