



MASSACHUSETTS

Department of Elementary
and Secondary Education

*Release of Spring 2026
MCAS Test Items from the
Grade 7 Mathematics
Paper-Based Test*

Spring 2026

**Massachusetts Department of
Elementary and Secondary Education**



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and Secondary Education

This document was prepared by the
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Commissioner

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Overview of Grade 7 Mathematics Test

The spring 2026 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 MCAS Resource Center website at mcas.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.

Massachusetts 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 $\approx$ 3.785 liters

1 liter $\approx$ 0.264 gallon

1 liter = 1000 cubic centimeters

1 inch = 2.54 centimeters

1 meter $\approx$ 39.37 inches

1 mile = 5280 feet

1 mile = 1760 yards

1 mile $\approx$ 1.609 kilometers

1 kilometer $\approx$ 0.62 mile

1 pound = 16 ounces

1 pound $\approx$ 0.454 kilogram

1 kilogram $\approx$ 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 $A = \pi r^2$

VOLUME (V) FORMULAS

cube $V = s^3$

(s = length of an edge)

right prism $V = Bh$

TOTAL SURFACE AREA (SA) FORMULAS

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

CIRCLE FORMULAS

area $A = \pi r^2$

circumference . . $C = 2\pi r$

OR

$C = \pi d$

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

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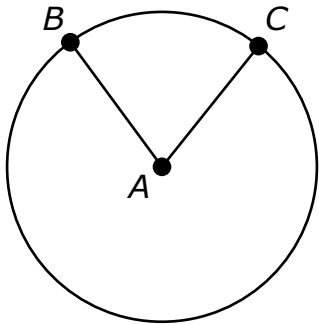
- 1** Consider this expression.

$$4.6 - 4.9$$

Which of the following is equivalent to the expression?

- Ⓐ $4.9 - 4.6$
- Ⓑ $4.6 + 4.9$
- Ⓒ $4.6 + (-4.9)$
- Ⓓ $4.9 - (-4.6)$

- 2 A circle that has its center at point A is shown.



In the circle, point B and point C lie on the circle.

Line segment AB has a distance of 6 inches. What is the distance, in inches, of line segment AC ?

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

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

3 An online company prints and ships photos.

- The company charges \$0.10 per photo to print each order of photos.
 - The company charges a flat rate of \$4.95 to ship each order.
- A. What is the total amount of money, in dollars, the company charges to print and ship an order of 50 photos? Show or explain how you got your answer.
- B. Write an equation that can be used to find c , the total amount of money, in dollars, the company charges to print and ship an order of p photos.
- C. The company charged a total of \$13.35 to print and ship an order of photos. What was the number of photos in the order? Show or explain how you got your answer.
- D. A customer will order some photos from the online company. The customer wants to spend less than \$17.45.

Write **and** solve an inequality that can be used to find p , the possible numbers of photos the customer can order from the online company **and** spend less than a total of \$17.45. Show or explain how you got your answer.

3

- 4** Which of the following expressions have a negative value?

Select the **two** correct answers.

Ⓐ $8(0.4)$

Ⓑ $-\frac{4}{5}(0.8)$

Ⓒ $(-3)(-7)$

Ⓓ $-4.5\left(-\frac{3}{8}\right)$

Ⓔ $3\left(\frac{2}{-5}\right)$

This question has two parts.

- 5** Two students are writing expressions in their notebooks.

Part A

The first student wrote this expression in her notebook.

$$(12x - 15) - (9x + 7)$$

Which of the following is equivalent to the first student's expression?

- Ⓐ $3x - 8$
- Ⓑ $3x - 22$
- Ⓒ $21x - 8$
- Ⓓ $21x - 22$

Part B

The second student wrote this expression in his notebook.

$$5x + 3(6x - 9)$$

Which of the following is equivalent to the second student's expression?

- Ⓐ $23x - (-27)$
- Ⓑ $23x - 27$
- Ⓒ $9x - 18$
- Ⓓ $9x - (-18)$

- 6 Three students each walked $\frac{3}{4}$ of a mile.

This table shows the time, in hours, they each spent walking.

Time Spent Walking

Student	Time (hours)
Hazel	$\frac{2}{3}$
Michel	$\frac{3}{5}$
Anita	$\frac{5}{6}$

Based on the table, at what rate, in miles per hour (mph), did each student walk $\frac{3}{4}$ of a mile?

Select the **three** correct sentences.

- Ⓐ Hazel walked at a rate of $1\frac{1}{8}$ mph.
- Ⓑ Hazel walked at a rate of $1\frac{1}{4}$ mph.
- Ⓒ Michel walked at a rate of $\frac{9}{10}$ mph.
- Ⓓ Michel walked at a rate of $1\frac{1}{4}$ mph.
- Ⓔ Anita walked at a rate of $\frac{9}{10}$ mph.
- Ⓕ Anita walked at a rate of $1\frac{1}{8}$ mph.

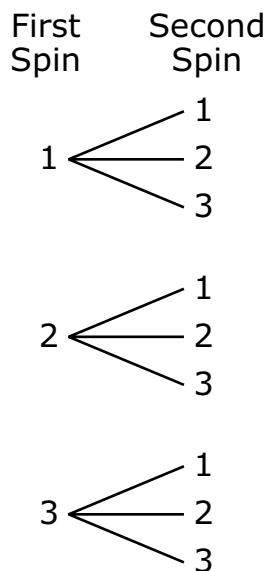
- 7 A student wrote this subtraction expression.

$$9 - (-5)$$

Which of the following is the student's expression rewritten as an addition expression?

- Ⓐ $-9 + (-5)$
- Ⓑ $-9 + 5$
- Ⓒ $9 + (-5)$
- Ⓓ $9 + 5$

- 8 Austin has a spinner that is divided into three congruent sections. The sections are labeled 1, 2, and 3. Austin will spin the arrow on the spinner two times. This tree diagram shows all the possible outcomes that can result when Austin spins the arrow two times.



What is the probability that the arrow will stop on the same number both times that Austin spins it?

- Ⓐ $\frac{1}{27}$
- Ⓑ $\frac{1}{9}$
- Ⓒ $\frac{1}{6}$
- Ⓓ $\frac{1}{3}$

- 9 Consider this expression.

$$-9.6 \div 0.12$$

Which of the following is equivalent to the expression?

- Ⓐ -80
- Ⓑ -8
- Ⓒ 8
- Ⓓ 80

- 10 A student made a picture frame in the shape of a rectangle.

- The length of the frame is k inches.
- The width of the frame is $0.8k$ inches.

Which of the following expressions represent the perimeter, in inches, of the picture frame?

Select the **two** correct answers.

- Ⓐ $2(0.8k) + 2(k)$
- Ⓑ $2 + (0.8k)(2k)$
- Ⓒ $(2)(0.8)(2k)$
- Ⓓ $2(0.8k + k)$
- Ⓔ $2(2k)$

Grade 7 Mathematics

SESSION 2

This session contains 10 questions.

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



Directions

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Examples

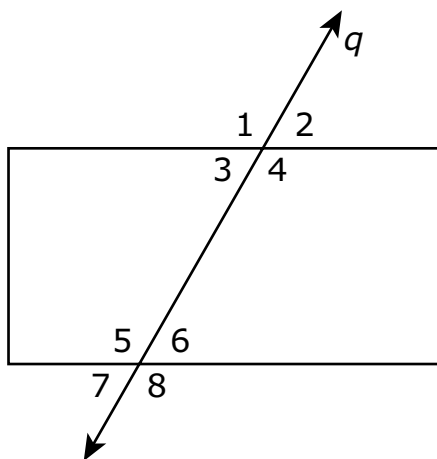
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9	●	9	9	9	9	9

- 11 Line q intersects a rectangle. The angles formed by the intersections are represented by numbers, as shown in this diagram.



Based on the diagram, which of the following pairs of angles are vertical angles?

Select the **two** correct answers.

- Ⓐ angle 1 and angle 2
- Ⓑ angle 2 and angle 3
- Ⓒ angle 4 and angle 8
- Ⓓ angle 5 and angle 7
- Ⓔ angle 5 and angle 8

- 12 At a carnival, visitors can spin the arrow on a spinner to try to win a prize.
- The probability that the arrow on the spinner will stop in a section that does **not** result in a prize is 0.85.
 - On Saturday, visitors spun the arrow on the spinner a total of 60 times.

Which of the following is **closest** to the expected number of times visitors did **not** win a prize when spinning the arrow on the spinner on Saturday?

- Ⓐ 9
- Ⓑ 15
- Ⓒ 51
- Ⓓ 85

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

- 13** A chef uses a recipe that requires $\frac{2}{3}$ cup of rice to make 4 servings of soup.

A. The chef will make 12 servings of soup for a small dinner party.

Based on the recipe, how many cups of rice does the chef need to make 12 servings of soup? Show or explain how you got your answer.

B. Which of the following equations can be used to find c , the number of cups of rice the chef needs to make x servings of soup?

Mark your answer by filling in the appropriate circle on the next page.

A $c = 6x$

B $c = \frac{1}{6}x$

C $x = \frac{1}{6}c$

D $cx = 6$

C. Based on the recipe, how many servings of soup can the chef make with 16 cups of rice? Show or explain how you got your answer.

D. The chef needs to buy some bags of rice in order to make 48 servings of soup for a large dinner party.

- Each bag contains 4 cups of rice.
- Each bag of rice costs \$3.50.

Based on the recipe, what is the cost, in dollars, of the bags of rice the chef needs to buy to make 48 servings of soup? Show or explain how you got your answer.

13

B. Ⓐ $c = 6x$

Ⓑ $c = \frac{1}{6}x$

Ⓒ $x = \frac{1}{6}c$

Ⓓ $cx = 6$

- 14 A school offered pizza with different toppings as an option for lunch one day. Half of the 360 students in the school ate pizza for their lunch that day.
- Of the students who ate pizza, $\frac{3}{5}$ chose mushrooms as a topping.
 - Of the students who ate pizza with mushrooms as a topping, 25% also ate a salad.
 - None of the other students in the school ate a salad.

How many students in the school ate a salad with their lunch?

- Ⓐ 27
- Ⓑ 54
- Ⓒ 108
- Ⓓ 133

- 15 A pretzel company wants to survey people at a grocery store to collect their opinions about a new flavor of pretzel. Which of the following sampling methods is **most likely** to produce a representative sample?
- Ⓐ surveying every child who enters the grocery store
 - Ⓑ surveying every adult who enters the grocery store
 - Ⓒ surveying every tenth person who enters the grocery store
 - Ⓓ surveying the first twenty people who enter the grocery store

- 16** A student has a bag that contains an unknown number of strips of paper. Each strip of paper is the same size and shape, and is labeled with a number from 1 to 6.

The student randomly selected a strip of paper from the bag, recorded the number that was on it, and then returned the strip of paper to the bag. The student repeated this a total of 100 times. This table shows the student's results.

Student's Results

Number on Strip of Paper	Number of Times It Was Selected
1	19
2	14
3	10
4	38
5	14
6	5

Based on the observed frequencies in the table, which of the following statements are true?

Select the **two** correct answers.

- Ⓐ The probability of selecting a strip of paper that has a 1 on it is 0.19.
- Ⓑ The probability of selecting a strip of paper that has a 1 on it is 0.38.
- Ⓒ The probability of selecting a strip of paper that has a 1 on it is 0.50.
- Ⓓ The probability of selecting a strip of paper that has an even number on it is 0.50.
- Ⓔ The probability of selecting a strip of paper that has an even number on it is 0.57.
- Ⓕ The probability of selecting a strip of paper that has an even number on it is 0.76.

- 17** Which of the following sets of measurements could be used to represent the side lengths of a triangle?

Select the **two** correct answers.

- Ⓐ 3 feet, 4 feet, 4 feet
- Ⓑ 3 feet, 8 feet, 4 feet
- Ⓒ 4 feet, 3 feet, 5 feet
- Ⓓ 4 feet, 3 feet, 7 feet
- Ⓔ 4 feet, 4 feet, 9 feet

- 18** A cylinder and its base, B , are shown in this diagram.



The cylinder will be sliced either parallel to its base or perpendicular to its base.

Which of the following statements correctly describe the two-dimensional shape that could result from either slice?

Select the **three** correct statements.

- Ⓐ A rectangle will result from slicing the cylinder parallel to its base.
- Ⓑ A rectangle will result from slicing the cylinder perpendicular to its base.
- Ⓒ A hexagon will result from slicing the cylinder perpendicular to its base.
- Ⓓ A hexagon will not result from slicing the cylinder parallel or perpendicular to its base.
- Ⓔ A circle will result from slicing the cylinder parallel to its base.
- Ⓕ A circle will not result from slicing the cylinder parallel or perpendicular to its base.

- 19** A student has 4 bags of marbles.

- Bag A contains a total of 3 marbles and 2 are red.
- Bag B contains a total of 7 marbles and 5 are red.
- Bag C contains a total of 25 marbles and 13 are red.
- Bag D contains a total of 50 marbles and 13 are red.

The student will pick one marble from a bag without looking. From which bag is the student most likely to pick a red marble?

- Ⓐ bag A
- Ⓑ bag B
- Ⓒ bag C
- Ⓓ bag D

- 20** Before a pay increase, a cashier's hourly wage was \$14.55. After the pay increase, the cashier's hourly wage was \$15.42.

What was the percent increase in the cashier's hourly wage?

- Ⓐ 0.06%
- Ⓑ 0.87%
- Ⓒ 6%
- Ⓓ 94%

Grade 7 Mathematics

Spring 2026 Released Operational Items

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
1	6	<i>The Number System</i>	7.NS.A.1	SR	Determine which expression is equivalent to a given subtraction expression with decimals.	C
2	7	<i>Geometry</i>	7.G.B.4	SA	Determine the distance between the center of a circle and a point drawn on the circle, given its radius.	6
3	8–9	<i>Expressions and Equations</i>	7.EE.B.4	CR	Write and solve equations and inequalities in a real-world problem.	
4	10	<i>The Number System</i>	7.NS.A.2	SR	Identify which products of positive and negative rational numbers have negative values.	B,E
5	11	<i>Expressions and Equations</i>	7.EE.A.1	SR	Identify equivalent expressions found by factoring and expanding given expressions.	B;B
6	12	<i>Ratios and Proportional Relationships</i>	7.RP.A.1	SR	Determine the unit rates associated with ratios of fractions to solve a real-world problem.	A,D,E
7	13	<i>The Number System</i>	7.NS.A.1	SR	Determine which addition expression is equivalent to a given subtraction expression.	D
8	14	<i>Statistics and Probability</i>	7.SP.C.8	SR	Determine the probability of a compound event using a tree diagram.	D
9	15	<i>The Number System</i>	7.NS.A.2	SR	Evaluate a division expression with positive and negative decimals.	A
10	15	<i>Expressions and Equations</i>	7.EE.A.2	SR	Identify equivalent algebraic expressions that represent the perimeter of a rectangle in a real-world context.	A,D
11	18	<i>Geometry</i>	7.G.B.5	SR	Given a diagram of a line intersecting a rectangle, identify vertical angles.	B,E
12	19	<i>Statistics and Probability</i>	7.SP.C.6	SR	Use a given probability to predict the expected number of events that will occur in a real-world situation.	C
13	20–21	<i>Ratios and Proportional Relationships</i>	7.RP.A.2	CR	Determine unit rates associated with ratios of fractions and use them to write an equation and solve real-world problems.	
14	22	<i>The Number System</i>	7.NS.A.3	SR	Solve a multi-step real-world problem involving integers, fractions, and percents.	A
15	22	<i>Statistics and Probability</i>	7.SP.A.1	SR	Identify which sampling method would most likely produce a representative sample for a given population.	C
16	23	<i>Statistics and Probability</i>	7.SP.C.7	SR	Determine the probability of an event using observed frequencies presented in a table.	A,E
17	24	<i>Geometry</i>	7.G.A.2	SR	Determine whether each given set of side lengths could be the side lengths of a triangle.	A,C

PBT Item No.	Page No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
18	25	<i>Geometry</i>	7.G.A.3	SR	Determine which two-dimensional shape will result from slicing a three-dimensional figure perpendicular to or parallel to its base.	B,D,E
19	26	<i>Statistics and Probability</i>	7.SP.C.5	SR	Determine and compare probabilities to identify the likelihood of a given event.	B
20	26	<i>Ratios and Proportional Relationships</i>	7.RP.A.3	SR	Determine the percent increase in a real-world problem.	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 2026 Unreleased Operational Items

PBT Item No.	Reporting Category	Standard	Item Type*	Item Description
21	<i>Ratios and Proportional Relationships</i>	7.RP.A.3	SR	Solve a multi-step real-world ratio problem.
22	<i>Statistics and Probability</i>	7.SP.A.2	SR	Given a random sample from a population, identify the probability of an occurrence and make a prediction about the entire population.
23	<i>Expressions and Equations</i>	7.EE.A.1	SR	Determine which expression is equivalent to the difference of two given expressions.
24	<i>The Number System</i>	7.NS.A.2	SA	Solve a real-world problem by multiplying a fraction by a whole number.
25	<i>Expressions and Equations</i>	7.EE.A.1	SR	Expand a given linear expression with a decimal using the Distributive Property to create an equivalent expression.
26	<i>Ratios and Proportional Relationships</i>	7.RP.A.1	SR	Determine the unit rate associated with a given ratio of fractions in a real-world context.
27	<i>The Number System</i>	7.NS.A.1	SR	Evaluate an expression that contains positive and negative decimals.
28	<i>Statistics and Probability</i>	7.SP.C.7	CR	Determine and compare the probabilities of events presented on a spinner and in a table, and explain the differences in predictions made from both models.
29	<i>The Number System</i>	7.NS.A.3	SR	Evaluate an expression that contains positive and negative fractions.
30	<i>The Number System</i>	7.NS.A.1	SR	Evaluate an expression with positive and negative rational numbers and identify the value plotted on a number line.
31	<i>The Number System</i>	7.NS.A.3	SR	Convert a value from one system of measurement to another in a real-world context.
32	<i>Ratios and Proportional Relationships</i>	7.RP.A.2	SR	Given the graph of a real-world proportional relationship, identify the graph that shows a point representing a given x value.
33	<i>Statistics and Probability</i>	7.SP.B.4	SR	Given two data sets, compare the mean and the median of both sets of data.
34	<i>Expressions and Equations</i>	7.EE.B.4	SR	Determine which expression represents a given real-world relationship between two variables based on information displayed in a table.
35	<i>Expressions and Equations</i>	7.EE.A.1	SR	Identify expressions that are equivalent to a given algebraic expression by using factoring.
36	<i>Geometry</i>	7.G.B.6	CR	Solve a real-world problem involving the volume and surface area of a rectangular prism and the number of cubes that can be cut from the rectangular prism given the edge length of one cube.
37	<i>Expressions and Equations</i>	7.EE.B.3	SR	Solve a real-world, multi-step problem involving mixed numbers, percentages, and whole numbers.
38	<i>Ratios and Proportional Relationships</i>	7.RP.A.1	SR	Given a real-world problem, identify an expression that can be used to find a unit rate and determine a unit rate based on given ratios of fractions.
39	<i>Expressions and Equations</i>	7.EE.A.2	SR	Rewrite a given expression that represents a real-world situation, and evaluate the new expression for a given value.
40	<i>The Number System</i>	7.NS.A.3	SA	Use operations with decimals to solve a real-world problem.

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