

Computer-Based Released Items

Grade 6 Mathematics

Spring 2023

The spring 2023 grade 6 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.

The Department of Elementary and Secondary Education is releasing items from both versions of the test to provide information about the knowledge and skills that students are expected to demonstrate.

- Released items from the **computer-based test** are available online at mcas.pearsonsupport.com/released-items. The computer-based released items are collected in a mini test called an ePAT (electronic practice assessment tool). Items in the ePAT are displayed in TestNav 8, the testing platform for the computer-based tests.
- Released items from the **paper-based test** are available in PDF format on the Department’s website at www.doe.mass.edu/mcas/testitems.html.

This document provides information about each released item from the *computer-based test*, including the following: reporting category, standard(s) covered, item type, item description, and correct answer (for released selected-response and short-answer items only). Information about unreleased operational items is also presented here. Sample student responses and scoring rubrics for released constructed-response items will be posted at www.doe.mass.edu/mcas/student/.

A Note about Testing Mode

Most of the operational items on the grade 6 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.

Grade 6 Mathematics
Spring 2023 Computer-Based Released Operational Items

CBT Item No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer**
1	Expressions and Equations	6.EE.B.5	SR	Solve a two-step equation for an unknown value.	C
2	The Number System	6.NS.C.7	SR	Create inequality statements with and without absolute values.	<i>see page 5</i>
3	Ratios and Proportional Relationships	6.RP.A.2	SA	Determine the unit rate within a real-world context.	15.75
4	Expressions and Equations	6.EE.A.2	SA	Evaluate an expression using substitution.	3
5	Geometry	6.G.A.2	SR	Solve a real-world problem involving the volume of a right rectangular prism.	D
6	Statistics and Probability	6.SP.B.4	SA	Create a histogram based on given data from a real-world situation.	<i>see page 5</i>
7	The Number System	6.NS.B.2	CR	Solve a real-world problem by dividing multi-digit numbers.	
8	Ratios and Proportional Relationships	6.RP.A.1	SR	Identify the ratios that represent the relationships between given quantities.	<i>see page 5</i>
9	Ratios and Proportional Relationships	6.RP.A.3	SR	Solve a real-world problem that involves finding the part given the percent and the whole.	<i>see page 5</i>
10	Expressions and Equations	6.EE.A.4	SR	Determine which expression is equivalent to a given variable expression.	B
11	Expressions and Equations	6.EE.A.3	SR	Use the distributive property to determine equivalent expressions given a variable expression.	B,D
12	Statistics and Probability	6.SP.A.3	SR	Determine the best measure of variability for a real-world situation.	C
13	Expressions and Equations	6.EE.B.6	SA	Write an expression that represents a given real-world context.	<i>see page 6</i>
14	Geometry	6.G.A.1	CR	Solve mathematical problems that involve decomposing a figure into a right triangle and a trapezoid to determine the total area of the figure.	
15	Expressions and Equations	6.EE.A.1	SR	Translate a given verbal expression to a numerical expression with exponents.	D
16	Statistics and Probability	6.SP.A.1	SR	Identify multiple statistical questions.	D,E
17	Ratios and Proportional Relationships	6.RP.A.3	SR	Use ratio and rate reasoning to solve a real-world problem.	<i>see page 6</i>
18	Expressions and Equations	6.EE.A.2	SR	Determine which mathematical expression represents a verbal description.	D

19	Statistics and Probability	6.SP.B.5	SR	Determine the mean for a set of data represented in a table.	D
20	Expressions and Equations	6.EE.A.4	SR	Use the distributive property to determine which expressions in a table are equivalent to a given variable expression and which are not.	<i>see page 6</i>

* 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. Pages 5 and 6 of this document provide correct answers for technology-enhanced (TE) items. Sample responses and scoring guidelines for constructed-response items will be posted at www.doe.mass.edu/mcas/student/default.html.

Grade 6 Mathematics
Spring 2023 Computer-Based Unreleased Operational Items

CBT Item No.	Reporting Category	Standard	Item Type*	Item Description
21	The Number System	6.NS.C.8	SR	Use absolute value to determine the distance between two points on a coordinate plane given a mathematical context.
22	Statistics and Probability	6.SP.B.5	SA	Identify the number of observations on a histogram.
23	Statistics and Probability	6.SP.A.1	SR	Identify multiple statistical questions.
24	Expressions and Equations	6.EE.B.6	CR	Create and evaluate expressions based on a real-world situation.
25	The Number System	6.NS.B.2	SR	Determine whether given division equations are true or false.
26	The Number System	6.NS.C.7	SA	Identify a rational number that is within a range of other rational numbers.
27	Geometry	6.G.A.4	SR	Use the net of a triangular prism to find its surface area.
28	The Number System	6.NS.C.6	SR	Determine the value of a given point on a number line.
29	Expressions and Equations	6.EE.C.9	SR	Interpret the relationship between two variables and use the relationship to create an equation.
30	Geometry	6.G.A.3	SA	Find the length of the side of a polygon by finding the distance between points on a coordinate plane.
31	Statistics and Probability	6.SP.B.4	SR	Determine which histogram represents a given set of data.
32	The Number System	6.NS.C.8	SR	Identify the location of a given point on a coordinate plane.
33	Ratios and Proportional Relationships	6.RP.A.3	CR	Using ratio and proportional reasoning, solve real-world problems involving fractions, decimals, percentages, and whole numbers.
34	Ratios and Proportional Relationships	6.RP.A.2	SR	Determine which ratios are equivalent to a given unit rate.
35	The Number System	6.NS.C.8	SR	Determine the location of a point on a coordinate plane based on its distance from a given point.
36	Statistics and Probability	6.SP.A.2	SR	Analyze a dot plot using median, mode, and range.
37	Expressions and Equations	6.EE.A.2	SR	Identify expressions using mathematical terms such as sum, product, quotient, and difference.
38	Expressions and Equations	6.EE.A.2	SR	Create a verbal description that represents a mathematical expression.
39	Geometry	6.G.A.3	SR	Determine the type of a polygon given the coordinates of its vertices.
40	Ratios and Proportional Relationships	6.RP.A.3	SR	Solve a real-world problem involving percentages.

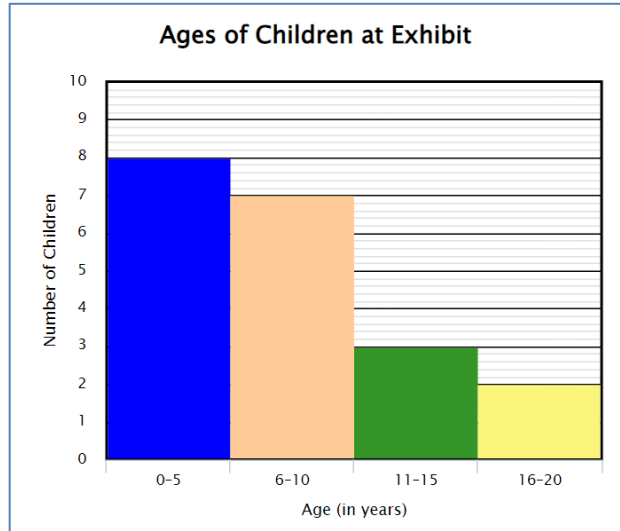
* Mathematics item types are selected-response (SR), short-answer (SA), and constructed-response (CR).

Correct Answer for CBT Item #2: Technology-Enhanced Item

The number -24 is the number -18 .

The expression $|-24|$ is the expression $|-18|$.

Correct Answer for CBT Item #6: Technology-Enhanced Item



Correct Answer for CBT Item #8: Technology-Enhanced Item

Relationship	7:8	$\frac{7}{2}$	21 to 51
flamingos to penguins	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
flamingos to all birds at the zoo	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
flamingos to storks	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Correct Answer for CBT Item #9: Technology-Enhanced Item

The sixth-grade students collected soda cans.

The seventh-grade students collected soda cans.

Correct Answer for CBT Item #13: Technology-Enhanced Item

6w or 6(w)
or other mathematically equivalent expression

Correct Answer for CBT Item #17: Technology-Enhanced Item

Part A:

There are 4 cups of for every 1 cup of .

Part B:

There are $\frac{3}{2}$ cups of for every 1 cup of .

Correct Answer for CBT Item #20: Technology-Enhanced Item

Expression	Equivalent	Not Equivalent
$11x + 12y$	<input type="radio"/>	<input checked="" type="radio"/>
$18x + 20y$	<input checked="" type="radio"/>	<input type="radio"/>
$2(9x) + 2(10y)$	<input checked="" type="radio"/>	<input type="radio"/>
$2(19xy)$	<input type="radio"/>	<input checked="" type="radio"/>