

Computer-Based Released Items

Grade 10 MCAS Mathematics

Spring 2025

The spring 2025 grade 10 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.

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.onlinehelp.cognia.org/released-items.
- Released items from the **paper-based test** are available in PDF format on the Department's website at www.doe.mass.edu/mcas/release.html.

This document provides information about each released item from the *computer-based test*, including the following: reporting category, standard covered, item type, item description, and correct answer (for selected-response and short-answer items only). Sample responses and scoring guidelines for 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 10 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 or multiple-select items that tested the same Mathematics content and assessed the same standard as the technology-enhanced item.

Grade 10 Mathematics
Spring 2025 Computer-Based Released Operational Items

CBT Item No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer (SR)**
1	<i>Algebra and Functions</i>	A-REI.B.3	SR	Given a linear inequality, identify the minimum value that makes the inequality true.	C
2	<i>Geometry</i>	G-C.B.5	SR	Identify an expression that represents the area of a sector of a circle given a radius and a central angle measure.	A
3	<i>Algebra and Functions</i>	A-REI.A.1	SR	Explain each step in the solution of a linear equation.	<i>see page 5</i>
4	<i>Number and Quantity</i>	N-RN.A.2	SR	Use laws of exponents to evaluate a radical expression.	D
5	<i>Algebra and Functions</i>	A-SSE.B.3	SR	Determine the zeros of a quantity defined by a quadratic expression.	C,D
6	<i>Statistics and Probability</i>	S-ID.B.6	CR	Given a set of data, create a scatter plot, describe the relationship of the variables, interpolate the data, and create an equation that represents the data.	
7	<i>Geometry</i>	G-SRT.C.7	SR	Relate the sine and cosine of acute angles in a right triangle.	B
8	<i>Algebra and Functions</i>	A-REI.D.11	SR	Given the equations of two lines, identify the x-coordinate of the point at which the lines intersect.	B
9	<i>Algebra and Functions</i>	F-BF.A.2	SR	Identify an expression that represents a given geometric sequence.	B
10	<i>Geometry</i>	G-CO.B.7	SR	Identify congruent sides and angles of triangles based on a congruence statement.	A,C,D
11	<i>Algebra and Functions</i>	A-APR.A.1	SR	Given a quadratic expression, use the distributive property to create an equivalent expression and analyze the product of a binomial and a trinomial.	Part A: <i>see page 5</i> Part B: B
12	<i>Algebra and Functions</i>	F-BF.B.3	SR	Identify the graph of a linear function over a vertical shift.	A
13	<i>Number and Quantity</i>	N-RN.A.1	CR	Evaluate expressions involving radicals and rational exponents, rewrite an exponential expression as a radical expression, and determine the value of the variable in a radical expression that gives the expression a known value.	
14	<i>Geometry</i>	G-CO.C.11	SA	Use properties of parallelograms to analyze the diagonals of a parallelogram and to solve a problem.	<i>see page 5</i>
15	<i>Algebra and Functions</i>	A-CED.A.2	SR	Identify an equation of a line graphed on a coordinate plane.	A
16	<i>Number and Quantity</i>	N-RN.B.3	SR	Determine whether the values of given expressions are rational.	C,D
17	<i>Algebra and Functions</i>	A-REI.D.12	SA	Graph the solution set of a linear inequality in two variables on a coordinate plane.	<i>see page 6</i>

CBT Item No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer (SR)**
18	<i>Algebra and Functions</i>	F-IF.C.7	SA	Analyze the maximum value of a quadratic function, and an interval over which the function exceeds a given value, based on its graph.	2.5;C
19	<i>Statistics and Probability</i>	S-ID.A.3	SR	Determine the effect on the mean and the median if an outlier is removed from a set of data.	D
20	<i>Geometry</i>	G-GPE.A.1	SR	Determine the coordinates of the center of a circle and its radius given its equation.	<i>see page 6</i>
21	<i>Algebra and Functions</i>	F-LE.A.1	SR	Identify a table that represents a linear relationship from a description of a real-world situation.	D
22	<i>Geometry</i>	G-C.A.2	SR	Find the measure of a central angle in a circle given a major arc measure.	B
23	<i>Algebra and Functions</i>	A-SSE.A.1	SR	Analyze the parts of a quadratic expression to identify their roles within the expression.	<i>see page 6</i>
24	<i>Geometry</i>	G-CO.A.3	SR	Identify a figure that has rotational symmetry.	A
25	<i>Number and Quantity</i>	N-Q.A.3	SR	Use measurement error to calculate a value relating to a real-world claim.	B
26	<i>Geometry</i>	G-GPE.B.4	SR	Describe a point's location in relation to a circle given the coordinates of the center of the circle and a point that lies on the circle.	<i>see page 6</i>
27	<i>Algebra and Functions</i>	F-IF.A.2	CR	Evaluate a quadratic function for different elements of its domain and interpret these values in terms of a context.	
28	<i>Statistics and Probability</i>	S-CP.A.4	SR	Calculate a probability from data shown in a two-way frequency table.	C
29	<i>Algebra and Functions</i>	F-LE.B.5	SR	Interpret the parameters of an exponential function that represents a real-world situation.	<i>see page 7</i>
30	<i>Geometry</i>	G-SRT.A.2	SR	Use a proportion to determine possible side lengths of two similar triangles.	B
31	<i>Geometry</i>	G-GPE.B.5	SR	Describe possible slopes of two lines that are perpendicular.	D
32	<i>Number and Quantity</i>	N-Q.A.2	SA	Use proportional analysis to answer questions about a real-world situation.	C;17
33	<i>Geometry</i>	G-GMD.A.3	SR	Describe the change in the volume of a circular cylinder as its radius and its height are scaled.	<i>see page 7</i>
34	<i>Geometry</i>	G-SRT.B.5	CR	Determine unknown side lengths and angle measures of two similar triangles based on a diagram of the triangles.	
35	<i>Statistics and Probability</i>	S-ID.C.8	SR	Describe the association of data and a linear model that represents it based on the correlation coefficient of the data.	Part A: C Part B: <i>see page 7</i>
36	<i>Statistics and Probability</i>	S-CP.B.6	SA	Calculate a conditional probability from a context.	<i>see page 7</i>
37	<i>Geometry</i>	G-CO.D.13	SR	Describe the completed construction of a figure inscribed in a circle.	D

CBT Item No.	Reporting Category	Standard	Item Type*	Item Description	Correct Answer (SR)**
38	<i>Geometry</i>	G-CO.A.5	SR	Identify a translation used to translate a pentagon graphed on a coordinate plane onto another pentagon.	C
39	<i>Geometry</i>	G-GMD.A.1	SA	Calculate the volume of a right cylinder and compare it to the volume of an oblique cylinder with similar dimensions.	Part A: 6280 Part B: <i>see page 8</i>
40	<i>Algebra and Functions</i>	A-REI.C.5	SA	Given a system of linear equations, determine the value of a coefficient in an equivalent system.	–8
41	<i>Geometry</i>	G-SRT.A.1	SR	Identify the scale factor used in a dilation on a coordinate plane given a pre-image, an image, and the center of dilation.	A
42	<i>Algebra and Functions</i>	F-IF.B.4	SR	Describe the rate of change of a linear function based on a description of the behavior of the variables.	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. Pages 5–8 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.

Correct Answer for CBT Item #3: Technology-Enhanced Item

Step	Explanation
$17x - 2 = 3x + 5$	Given
$14x - 2 = 5$	subtracted $3x$ from both sides
$14x = 7$	added 2 to both sides
$x = \frac{1}{2}$	divided both sides by 14

Correct Answer for CBT Item #11: Technology-Enhanced Item

Part A

$$2x^2 + -8x$$

Correct Answer for CBT Item #14: Technology-Enhanced Item

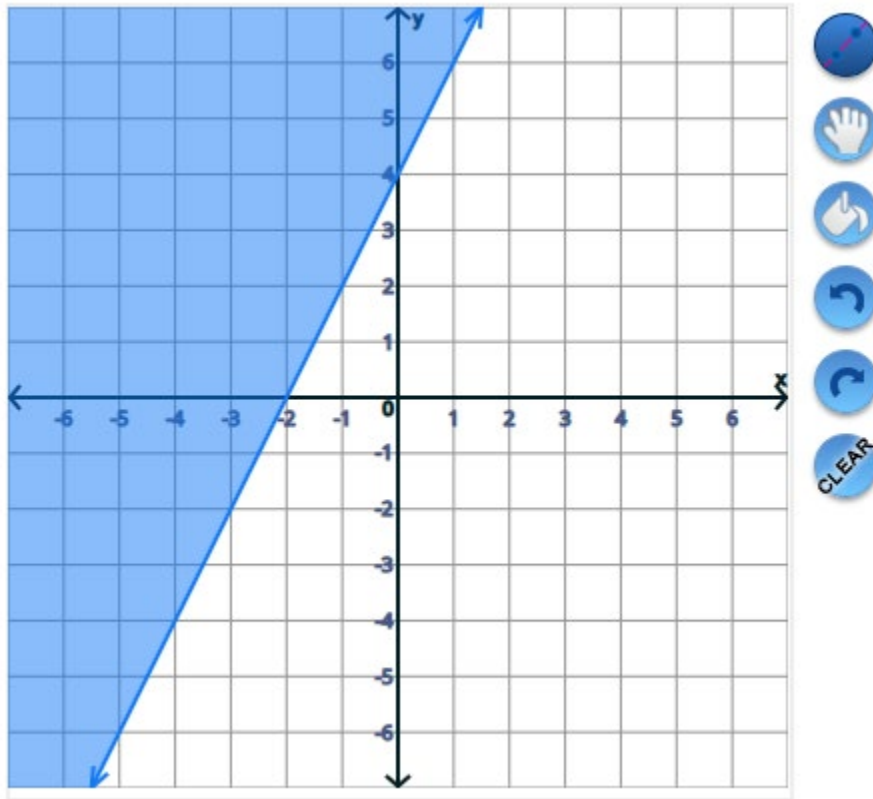
Part A

Statement	True	False
$PQ \cong SR$	☒	☐
$PT \cong RT$	☒	☐
$PR \cong SQ$	☐	☒

Part B

$$\frac{2}{3}$$

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



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

The coordinates of the center of the circle are . The radius of the circle is units.

Correct Answer for CBT Item #23: Technology-Enhanced Item

Coefficient	Constant	Exponent	Variable
3	4	2	x

Correct Answer for CBT Item #26: Technology-Enhanced Item

Point z lies the circle because the distance from point P to point z is the radius of the circle.

Correct Answer for CBT Item #29: Technology-Enhanced Item

Statement	True	False
The painting's value at the time of its purchase was \$ 10,500.	☒	☐
The painting's value is projected to increase by 15% per year.	☐	☒
The painting's value after 15 years will be twice its purchase price.	☐	☒

Correct Answer for CBT Item #33: Technology-Enhanced Item

If r is multiplied by 3, the volume of the cylinder will be times as great.

If h is multiplied by 4, the volume of the cylinder will be times as great.

Correct Answer for CBT Item #35: Technology-Enhanced Item**Part B**

Statement	Must Be True	Must Be False	May Be Either True or False
The slope is positive.	☒	☐	☐
The y-intercept is positive.	☐	☐	☒

Correct Answer for CBT Item #36: Technology-Enhanced Item

$$\frac{4}{5}$$

Correct Answer for CBT Item #39: Technology-Enhanced Item

Part B

The volume of cylinder E is the
volume of cylinder F because the of
the cylinders are