MCAP Maryland Comprehensive Assessment Program

Practice Test Answer and Alignment Document
Mathematics – Algebra I
Online

The following pages include the answer keys for all machine-scored items. A sample student response for the top score is included for all hand-scored constructed response items.

- Some answer keys include one possible sample student response. Other valid methods for solving the problem can earn full credit unless a specific method is required by the item.
- In items where the scores are awarded for full and partial credit, the definition of partial credit will be confirmed during range-finding (reviewing sets of real student work).
- If students make a computation error, they can still earn points for reasoning or modeling.

Section 1

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	C	F-LE.B.5-1
2.	The transformation for the function $g(x) = f(x - 3)$ is "Translation to the right." The transformation for the function $h(x) = -f(x)$ is "Reflection across the x-axis." The transformation for the function $j(x) = f(x) + 9$ is "Translation upward."	F-BF.B.3
3.	D	A-REI.C.6
4.	Points should be plotted at (0, –7) and (5, 0).	F-IF.C.7a-1
5.	$(x - [4])^2 = [21]$	A-REI.B.4a
6.	B	F-IF.B.5
7.	The number line should show a ray that points to the right with a solid point at 7.	A-REI.B.3-2

Item Number	Answer Key	Evidence Statement Key/ Content Scope
8.	C	A-SSE.B.3b
9.	A	A-CED.A.3
10.	The parabola should have a vertex at (0, 2) and pass through the points at (–2, 6), (–1, 3), (1, 3), and (2, 6).	A-REI.D.10
11.	B	N-RN.B.3
12.	The boundary for the graph of the inequality $y < 2x - 3$ should be a dashed line that passes through the points at (0, –3) and (1, –1). The boundary for the graph of the inequality $y > -2x - 7$ should be a dashed line that passes through the points at (0, –7) and (1, –9). The solution to the system of inequalities is the region to the right of the point where the two dashed lines intersect.	A-REI.D.12
13.	A, C, E	A-APR.B.3

Section 2

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	A	S-ID.C.8
2.	$y = 10x + 6(150 - x)$ or equivalent equation	A1.M.2 A-CED.A.2
3.	C	F-IF.C.9
4.	C, E	A1.M.5 S-ID.B.6b
5.	**Sample Top Score Response** The graph of the function f is a parabola that opens downward with a vertex 3 units above the x-axis. The graph of the function g is a vertical translation of the graph of function f by k units. If the value of k is less than -3, the vertex of the graph will be below the x-axis and the graph of $y = g(x)$ will have no x-intercepts. The graph of the function f has two x-intercepts because it is a parabola that opens downward with a vertex 3 units above the x-axis. The graph of function h is a horizontal translation of the graph of f by n units. Shifting the graph left or right will not affect the number of x-intercepts, so there are no values of n for which the graph of $y = h(x)$ will have no x-intercepts. **Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.**	A1.R.10 F-BF.B.3
6.	The domain of the function $y = -\|x\| + 6$ is all real numbers. The domain of the function $y = -\frac{2}{3}\sqrt{x} - 1$ is all real numbers greater than or equal to zero. The domain of the function $y = 2x^2$ is all real numbers.	F-IF.A.1

Item Number	Answer Key	Evidence Statement Key/ Content Scope
7.	D	A-SSE.B.3c
8.	B	A1.R.4 F-IF.C.7b
9.	A	A-REI.B.4b

Section 3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	D	F-LE.A.2
2.	**Sample Top Score Response** $x + y = 1$ $y = -x + 1$ $2x - 3(-x + 1) = 17$ $2x + 3x - 3 = 17$ $5x = 20$ $x = 4$ $y = -4 + 1 = -3$ Thus, the solution is $(4, -3)$. Confirming that the solution is valid: $4 + (-3) = 1$ $2(4) - 3(-3) = 17$ $8 + 9 = 17$ Since both equations are true, the solution is valid. **Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.**	A1.R.8 A-REI.A.1 A-REI.C.6
3.	B	A1.M.7 A-CED.A.3
4.	The section of the graph to the right of the point where the dashed lines intersect should be selected.	A1.R.3 A-REI.D.12

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	**Sample Top Score Response** The fuel economy modeled by the function for the vehicle with a weight of 1.875 tons is $f(1.875) = -10.139(1.875) + 49.993$, which is about 31 miles per gallon, which is 5.8 miles per gallon less than the actual fuel economy of the vehicle. The fuel economy modeled by the function for the vehicle with a weight of 3.25 tons is $f(3.25) = -10.139(3.25) + 49.993$, which is about 17 miles per gallon, which is 2.6 miles per gallon less than the actual fuel economy of the vehicle. A graph of the data indicates that the average rate of change in the fuel economy seems to decrease as the weight increases, so an exponential function would likely model the relationship better than a linear function. When the data were put in a calculator and an exponential function was found, the result was $f(w) = 64.947(0.673)^w$. **Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.**	A1.M.3 S-ID.B.6a-2
6.	–1/6	F-IF.B.6-1

Section 4

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	C	A-SSE.A.2
2.	B	A1.M.4 F-IF.A.2
3.	121	F-IF.A.3
4.	For the transformation $g(x) = f(-x)$, the equation $f(x) = g(x)$ has only one solution. For the transformation $g(x) = -f(x)$, the equation $f(x) = g(x)$ has two solutions.	A1.R.10 A-REI.D.11 F-BF.B.3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	**Sample Top Score Response** Let x represent the number of hours in one week that the student works at the doctor's office, and let y represent the number of hours in one week the student tutors. The system of inequalities is $\begin{cases} x + y \le 20 \\ 15x + 25y \ge 375 \end{cases}$ Solving for the intersection of the lines: $x + y = 20 \rightarrow y = 20 - x$ $15x + 25(20 - x) = 375$ $15x + 500 - 25x = 375$ $-10x = -125$ $x = 12.5$ $y = 20 - 12.5 = 7.5$ The greatest whole number of hours the student can work at the doctor's office each week is 12 because $15(12) + 25(8) = 380$ and if the student worked at the office for 13 hours or more, the student would earn less than $375. **Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.**	A1.M.6 A-CED.A.3
6.	A	A-CED.A.4
7.	D	A1.R.1 F-IF.B.4

Item Number	Answer Key	Evidence Statement Key/ Content Scope
8.	The trend line **overpredicts** the number of students using the library by the greatest amount for week [10]. The trend line **underpredicts** the number of students using the library by the greatest amount for week [3].	S-ID.B.6b