MCAP Maryland Comprehensive Assessment Program

Practice Test Answer and Alignment Document
Mathematics – Algebra I
Pencil-and-Paper

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.	C	F-BF.B.3
3.	D	A-REI.C.6
4.	A	F-IF.C.7a-1
5.	21	A-REI.B.4a
6.	B	F-IF.B.5
7.	D	A-REI.B.3-2
8.	C	A-SSE.B.3b
9.	A	A-CED.A.3
10.	C	A-REI.D.10
11.	B	N-RN.B.3
12.	C	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.	D	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.	B	F-IF.A.1
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.	D, E	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.	A	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.	B	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
8.	A	S-ID.B.6b