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.	D	A-CED.A.2
2.	125	A-SSE.B.3.a
3.	B	A1.M.7 A-CED.A.3
4.	Only relationship K has the first feature (A distance of 5 units between its *x*-intercepts) Both relationships J and K have the second feature (A *y*-intercept 6 units from the origin) Only relationship J has the third feature (A minimum value)	F-IF.C.9

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	**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
6.	The quadrants labeled "I", "II", and "IV" should be selected.	F-BF.B.3
7.	C, E	A1.M.5 S-ID.B.6b
8.	x = [−16] x = [2] or x = [2] x = [−16]	A-REI.B.4.b

Item Number	Answer Key	Evidence Statement Key/ Content Scope
9.	The value of $r + s$ must be rational. The value of $r + w$ must be irrational. The value of rs must be rational. The value of rw must be irrational.	N-RN.B.3

Section 2

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	B	F-IF.B.5
2.	$[0.15]x + [0.75]y \leq 30$ $[3]y \leq [1]x$	A-CED.A.3
3.	D	A1.R.1 A-REI.B.4.b
4.	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

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	**Sample Top Score Response** **Part A:** The situation is best modeled with an exponential function, because the resale value is decreasing at a constant percent rate of 15% per year. **Part B:** The situation can be modeled by the function $v(t) = p(0.85)^t$, where p is the value of the car when it was purchased, t is the number of years since it was purchased, and v is the current value of the car. We can use the fact that the value of the car 2 years after it was purchased was \$17,918 to find the value of the car when it was purchased by substituting into the function and solving for p. $17,918 = p(0.85)^2$ $17,918 = 0.7225p$ $p = 24,800$ This means that the value of the car when it was purchased was \$24,800. **Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.**	A1.M.1 F-LE.A.1c
6.	C	A-SSE.B.3.b
7.	The section of the graph to the right of both dashed lines should be selected.	A1.R.3 A-REI.D.12
8.	121	F-IF.A.3
9.	p = [4] q = [21]	A-REI.B.4.a

Section 3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	C	A-REI.D.10
2.	−12	A-APR.A.1
3.	B	A1.M.4 F-IF.A.2
4.	B, G	A-REI.D.11
5.	**Sample Top Score Response** **Part A:** The graph of the function f is a parabola opening down with a vertex 3 units above the x-axis. Shifting the function down by more than 3 units would result in a graph with no x-intercepts. The transformation would be of the form $g(x) = f(x) + k$ where $k < -3$. **Part B:** There is no such transformation. The graph of f is a parabola with two x-intercepts and a domain of all real numbers. No matter how much the parabola is shifted to the left or right, there will always be two 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.	C	F-LE.B.5-1
7.	$y = 10x + 6(150 - x)$ or equivalent	A1.M.2 A-CED.A.2
8.	C	F-IF.B.6-2
9.	$\frac{4}{7}$	A-REI.C.6

Section 4

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	D	F-LE.A.2
2.	–6	A-REI.B.3-1
3.	B	A1.R.4 F-IF.C.9
4.	The range of *f* is all real numbers [greater than or equal to] [–20].	F-IF.A.1
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 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: $x + y = 20 \rightarrow y = 20 - x$ $15x + 25(20 - x) = 375$ $15x + 500 + 25x = 375$ $-10x = -125$ $x = 12.5$ $y = 20 - 12.5 = 7.5$ Since the student only works a whole number of hours, the student should work at the office 12 hours each week since $15(12) + 25(8) = 380$ 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

Item Number	Answer Key	Evidence Statement Key/ Content Scope
6.	Points should be plotted at (0, –7) and (5, 0).	F-IF.C.7-1.a
7.	For the transformation $g(x) = f(-x)$, the equation $f(x) = g(x)$ has one solution. For the transformation $g(x) = -f(x)$, the equation $f(x) = g(x)$ has two solutions. For the transformation $g(x) = f(x) + k$, where $k \neq 0$, the equation $f(x) = g(x)$ has no solutions.	A1.R.10 A-REI.D.11 F-BF.B.3
8.	A	S-ID.C.8
9.	A, C, E	A-SSE.A.2