MCAP Maryland Comprehensive Assessment Program

Practice Test Answer and Alignment Document
Mathematics – Algebra II
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.	A	N-CN.C.7
2.	B	F-IF.A.3
3.	C	F-LE.A.4
4.	C	F-TF.A.2
5.	D	A-APR.D.6
6.	C	N-RN.A.2
7.	B	F-IF.C.9
8.	D	A-SSE.A.2-1
9.	A	F-IF.C.7e
10.	1	A-APR.B.2
11.	B	N-RN.A.2
12.	C, G	A-REI.A.2-1
13.	B	F-BF.B.4a

Section 2

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	C	A2.M.4 A-REI.D.11
2.	B, C, E	A-REI.D.11
3.	D	A2.M.2 F-LE.A.2-1
4.	A	A2.R.1 A-REI.A.2-2
5.	**Sample Top Score Response** A quadratic equation with real coefficients that has $x = -5i$ as a solution must also have $x = 5i$ as a solution. One such equation is $(x - 5i)(x + 5i) = 0$, which is equivalent to $x^2 + 25 = 0$. There is no quadratic equation with real coefficients that has $x = -5i$ as its **only** solution. If the only solution is $x = -5i$, then the quadratic equation is a multiple of $(x + 5i)^2 = 0$, which is equivalent to $x^2 + 10ix - 25 = 0$, and that equation cannot be equivalent to one with real coefficients because $10i$ is not a real number. **Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.**	A2.R.4 N-RN.A.2 N-CN.C.7
6.	A	F-IF.B.6-3
7.	D	A-REI.C.7
8.	B	F-TF.C.8

Section 3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	C	S-ID.B.6a
2.	**Sample Top Score Response** According to the model, the number of members in the 4th month is $m(4) = 300 - 280(0.76)^4$, which is approximately 207. According to the model, the number of members in the 8th month is $m(8) = 300 - 280(0.76)^8$, which is approximately 269. Average rate of change: $\frac{269-207}{8-4} = \frac{62}{4} = 15\frac{1}{2}$ members per month. The expression $280(0.76)^t$ approaches zero as t increases. So, $300 - 280(0.76)^t$ approaches 300 as t increases. Therefore, 300 is the maximum number of members. **Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.**	A2.M.4 F-IF.B.6-3 F-LE.B.5-1
3.	B	F-BF.A.2
4.	0	A2.R.4 A-APR.B.3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	**Sample Top Score Response** The two graphs intersect at the points $(x, y) = (-12, 46)$ and $(x, y) = (2, 4)$. The x coordinates of the points of intersection of the graph are those points for which $P(x) = Q(x)$. $P(x) = Q(x)$ $x^2 + 7x - 14 = -3x + 10$ $x^2 + 10x - 24 = 0$ $(x + 12)(x - 2) = 0$ $x = -12$ or $x = 2$ If $x = -12$, then $y = (-3)(-12) + 10 = 36 + 10 = 46$ If $x = 2$, then $y = (-3)(2) + 10 = -6 + 10 = 4$ Therefore, the points of intersection are $(x, y) = (-12, 46)$ and $(x, y) = (2, 4)$. **Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.**	A2.R.8 A-REI.D.11
6.	D	A2.M.5 F-TF.B.5

Section 4

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	B	F-BF.A.1a
2.	A, C	A2.R.6 N-RN.A.2
3.	2	A2.M.6 F-TF.B.5
4.	D	A-REI.A.2-2
5.	**Sample Top Score Response** The function $f(x) = 81.67(0.67)^x$ models the data. An exponential function was chosen because the data seems to decrease rapidly at first, then level off a bit. The constant 81.67 represents the box office revenue, in millions of dollars, predicted by the function 0 weeks after the movie opened—that is, during the movie's opening week. The constant 0.67 means that the revenue is decreasing on average by $1 - 0.67 = 0.33$ or 33% each week. 100,000 is 0.1 million, so the time when the function has a value less than 0.1 should be determined. By graphing $y = 81.67(0.67)^x$ and $y = 0.1$ on the same graph, it can be seen that the least number of weeks after the movie opened when the function value is less than 0.1 is 17. **Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.**	A2.M.2 S-ID.B.6a
6.	D	A2.R.10 A-APR.B.3
7.	B	F-LE.B.5-2
8.	A	A-SSE.B.3c