

## Draft MCAP Practice Test Answer and Alignment Document Mathematics – Algebra I Online Practice Test

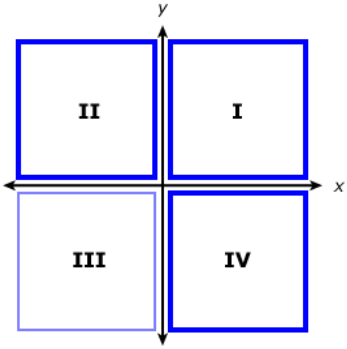
The following pages include the answer keys for all machine-scored items, as well as a sample top score response for hand-scored items. Please note that this document is still in draft form and will be posted to the MCAP mathematics practice test page ([support.mdassessments.com/practice-tests/math/](http://support.mdassessments.com/practice-tests/math/)) when it is fully completed. The finalized document may have slight differences from what is shown below. Until the finalized form of this document is posted, please use the contents of this document to help prepare for the MCAP mathematics assessment.

As a note:

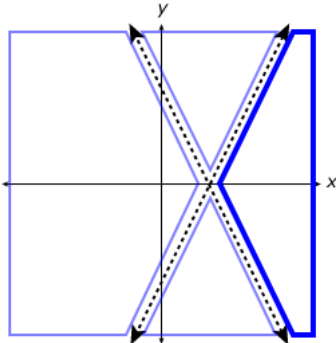
- Constructed Response Items will show an answer key with sample student responses. Other valid methods for solving the problem can earn full credit unless a specific method is required by the item.
- In Constructed Response items where scores are awarded for full and partial credit, the definition of 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 / Content Scope								
1	D	A.CED.A.2								
2	125	A.SSE.B.3a								
3	B	A1.M.7 A.CED.A.3								
4	<table border="1"> <thead> <tr> <th>Feature</th> <th>Relationships</th> </tr> </thead> <tbody> <tr> <td>A distance of 5 units between its <math>x</math>-intercepts</td> <td>K only</td> </tr> <tr> <td>A <math>y</math>-intercept 6 units from the origin</td> <td>Both J and K</td> </tr> <tr> <td>A minimum value</td> <td>J only</td> </tr> </tbody> </table>	Feature	Relationships	A distance of 5 units between its $x$ -intercepts	K only	A $y$ -intercept 6 units from the origin	Both J and K	A minimum value	J only	F.IF.C.9
Feature	Relationships									
A distance of 5 units between its $x$ -intercepts	K only									
A $y$ -intercept 6 units from the origin	Both J and K									
A minimum value	J only									
5	<p>Sample Top Score Response:</p> $x + y = 1$ $y = x + 1$ $2x - 3(-x + 1) = 17$ $2x + 3x - 3 = 17$ $5x = 20$ $x = 4$ $y = -4 + 1 = -3$ <p>Thus, the solution is <math>(4, -3)</math>.</p> <p>Confirming that the solution is valid:</p> $4 + (-3) = 1$ $2(4) - 3(-3) = 17$ $8 + 9 = 17$ <p>Since both equations are true, the solution is valid.</p>	A1.R.8 A.REI.A.1 A.REI.C.6								

Item Number	Answer Key	Evidence Statement / Content Scope															
6		F.BF.B.3															
7	C,E	A1.M.5 S.ID.B.6b															
8	$x = -16$ $x = 2$	A.REI.B.4b															
9	<table border="1"> <thead> <tr> <th></th> <th>Must Be Rational</th> <th>Must Be Irrational</th> </tr> </thead> <tbody> <tr> <td><math>r + s</math></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td><math>r + w</math></td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td><math>rs</math></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td><math>rw</math></td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> </tbody> </table>		Must Be Rational	Must Be Irrational	$r + s$	<input checked="" type="radio"/>	<input type="radio"/>	$r + w$	<input type="radio"/>	<input checked="" type="radio"/>	$rs$	<input checked="" type="radio"/>	<input type="radio"/>	$rw$	<input type="radio"/>	<input checked="" type="radio"/>	N.RN.B.3
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Section 2

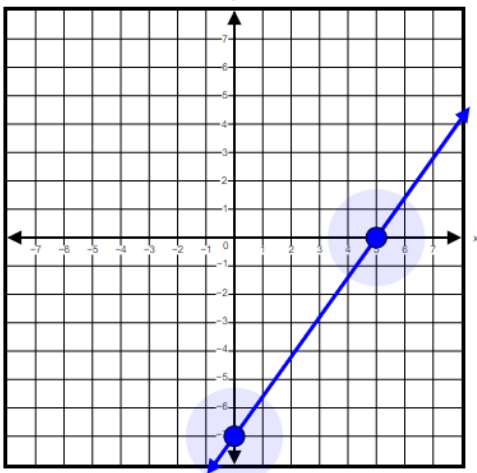
Item Number	Answer Key	Evidence Statement / Content Scope
1	B	F.IF.B.5
2	$\boxed{0.15}x + \boxed{0.75}y \leq 30$ $\boxed{3}y \leq \boxed{1}x$	A.CED.A.3
3	D	A1.R.1 A.REI.B.4b
4	<p>The trend line <b>overpredicts</b> the number of students using the library by the greatest amount for week <input type="text" value="10"/>.</p> <p>The trend line <b>underpredicts</b> the number of students using the library by the greatest amount for week <input type="text" value="3"/>.</p>	S.ID.B.6b
5	<p>Sample Top Score Response:</p> <p><b>Part A</b></p> <p>The situation is best modeled with an exponential function, because the resale value is decreasing at a constant percent rate of 15% per year.</p> <p><b>Part B</b></p> <p>The situation can be modeled by the function <math>v(t) = p(0.85)^t</math>, where <math>p</math> is the value of the car when it was purchased, <math>t</math> is the number of years since it was purchased, and <math>v</math> 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 <math>p</math>.</p> $17,918 = p(0.85)^2$ $17,918 = 0.7225p$ $p = 24,800$ <p>This means that the value of the car when it was purchased was \$24,800.</p>	A1.M.1 F.LE.A.1c
6	C	A.SSE.B.3b
7		A1.R.3 A.REI.D.12
8	121	F.IF.A.3

Item Number	Answer Key	Evidence Statement / Content Scope
9	$p = 4$ $q = 21$	A.REI.B.4a

### Section 3

Item Number	Answer Key	Evidence Statement / Content Scope
1	C	A.REI.D.10
2	$b = -12$	A.APR.A.1
3	B	A1.M.4 F.IF.A.2
4	B, G	A.REI.D.11
5	<p>Sample Top Score Response:</p> <p><b>Part A</b></p> <p>The graph of the function <math>f</math> is a parabola opening down with a vertex 3 units above the <math>x</math>-axis. Shifting the function down by more than 3 units would result in a graph with no <math>x</math>-intercepts. The transformation would be of the form <math>g(x)=f(x)+k</math> where <math>k&lt;-3</math>.</p> <p><b>Part B</b></p> <p>There is no such transformation. The graph of <math>f</math> is a parabola with two <math>x</math>-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 <math>x</math>-intercepts.</p>	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 / Content Scope
1	D	F.LE.A.2
2	$x = -6$	A.REI.B.3-1
3	B	A1.R.4 F.IF.C.9
4	The range of $f$ is all real numbers <input type="text" value="greater than or equal to"/> <input type="text" value="-20"/> .	F.IF.A.1
5	<p>Sample Top Score Response:</p> <p>Let <math>x</math> represent the number of hours in one week that the student works at the doctor's office, and let <math>y</math> represent the number of hours the student tutors.</p> <p>The system of inequalities is <math>\begin{cases} x + y \leq 20 \\ 15x + 25y \geq 375 \end{cases}</math></p> <p>Solving for the intersection of the lines:</p> $x + y = 20 \rightarrow y = 20 - x$ $15x + 25(20 - x) = 375$ $15x + 500 + 25x = 375$ $-10x = -125$ $x = 12.5$ $y = 20 - 12.5 = 7.5$ <p>Since the student only works a whole number of hours, the student should work at the office 12 hours each week since <math>15(12) + 25(8) = 380</math> and if the student worked at the office for 13 hours or more, the student would earn less than \$375.</p>	A1.M.6 A.CED.A.3
6		F.IF.C.7-1a

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7	<table border="1"> <thead> <tr> <th>Transformation</th> <th><math>f(x) = g(x)</math> Has No Solutions</th> <th><math>f(x) = g(x)</math> Has One Solution</th> <th><math>f(x) = g(x)</math> Has Two Solutions</th> </tr> </thead> <tbody> <tr> <td><math>g(x) = f(-x)</math></td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td><math>g(x) = -f(x)</math></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td><math>g(x) = f(x) + k,</math> where <math>k \neq 0</math></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </tbody> </table>	Transformation	$f(x) = g(x)$ Has No Solutions	$f(x) = g(x)$ Has One Solution	$f(x) = g(x)$ Has Two Solutions	$g(x) = f(-x)$	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	$g(x) = -f(x)$	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	$g(x) = f(x) + k,$ where $k \neq 0$	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	A1.R.10 A.REI.D.11 F.BF.B.3
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8	A	S.ID.C.8																
9	A, C, E	A.SSE.A.2																