

## 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	A-SSE.B.3.b
2.	B	A-REI.B.3-1
3.	Points should be plotted at (0, -7) and (5, 0).	F-IF.C.7-1.a
4.	A, C, E	A-SSE.A.2
5.	B	N-RN.B.3
6.	$p = [4]$ $q = [21]$	A-REI.B.4.a
7.	A	A-CED.A.3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
8.	<p>The transformation for the function <math>g(x) = f(x - 3)</math> is "Translation to the right."</p> <p>The transformation for the function <math>h(x) = -f(x)</math> is "Reflection across the x-axis."</p> <p>The transformation for the function <math>j(x) = f(x) + 9</math> is "Translation upward."</p>	F-BF.B.3
9.	D	A-CED.A.2
10.	D	A-REI.C.6
11.	C	F-LE.B.5-1
12.	<p>Only relationship K has the first feature (A distance of 5 units between its x-intercepts)</p> <p>Both relationships J and K have the second feature (A y-intercept 6 units from the origin)</p> <p>Only relationship J has the third feature (A minimum value)</p>	F-IF.C.9
13.	-12	A-APR.A.1

## Section 2

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	A	S-ID.C.8
2.	121	F-IF.A.3
3.	D	A1.R.1 F-IF.B.4
4.	B	A1.M.7 A-CED.A.3
5.	<p><b><u>Sample Top Score Response</u></b></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>. 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> <p><b>Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.</b></p>	A1.R.8 A-REI.A.1 A-REI.C.6
6.	C, E	A1.M.5 S-ID.B.6b
7.	D	A-SSE.B.3.c
8.	B, G	A-REI.D.11
9.	-1/6	F-IF.B.6-1

## Section 3

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	B	F-IF.B.5
2.	$y = 10x + 6(150 - x)$ or equivalent	A1.M.2 A-CED.A.2
3.	<p><b><u>Sample Top Score Response</u></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>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> <p><b>Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.</b></p>	A1.R.10 F-BF.B.3
4.	The section of the graph to the right of both dashed lines should be selected.	A1.R.3 A-REI.D.12

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	<p><b><u>Sample Top Score Response</u></b></p> <p><b>Part A</b></p> <p>The fuel economy modeled by the function for the vehicle with a weight of 1.875 tons is  <math>f(1.875) = -10.139(1.875) + 49.993</math>,  which is about 31 miles per gallon,  which is 5.8 miles per gallon less than the actual fuel economy of the vehicle.</p> <p>The fuel economy modeled by the function for the vehicle with a weight of 3.25 tons is  <math>f(3.25) = -10.139(3.25) + 49.993</math>,  which is about 17 miles per gallon,  which is 2.6 miles per gallon less than the actual fuel economy of the vehicle.</p> <p><b>Part B</b></p> <p>A graph of the data indicates that the 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 <math>f(w) = 64.947(0.673)^w</math>.</p> <p><b>Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.</b></p>	A1.M.3 S-ID.B.6-2.a
6.	<p>The domain of the function <math>y = - x  + 6</math> is all real numbers.</p> <p>The domain of the function <math>y = -\frac{2}{3}\sqrt{x} - 1</math> is all real numbers greater than or equal to zero.</p> <p>The domain of the function <math>y = 2x^2</math> is all real numbers.</p>	F-IF.A.1

## Section 4

Item Number	Answer Key	Evidence Statement Key/ Content Scope
1.	C	A-REI.D.11
2.	The trend line <b>overpredicts</b> the number of students using the library by the greatest amount for week [10]. The trend line <b>underpredicts</b> the number of students using the library by the greatest amount for week [3].	S-ID.B.6b
3.	B	A1.M.4 F-IF.A.2
4.	B	A1.R.4 F-IF.C.7.b

Item Number	Answer Key	Evidence Statement Key/ Content Scope
5.	<p><b><u>Sample Top Score Response</u></b></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</p> $\begin{cases} x + y \leq 20 \\ 15x + 25y \geq 375 \end{cases}$ <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> <p><b>Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.</b></p>	A1.M.6 A-CED.A.3
6.	<p>For the transformation <math>g(x) = f(-x)</math>, the equation <math>f(x) = g(x)</math> has one solution.</p> <p>For the transformation <math>g(x) = -f(x)</math>, the equation <math>f(x) = g(x)</math> has two solutions.</p>	A1.R.10 A-REI.D.11 F-BF.B.3
7.	$x = [-16]$ $x = [2]$ or $x = [2]$ $x = [-16]$	A-REI.B.4.b

Item Number	Answer Key	Evidence Statement Key/ Content Scope
8.	D	F-LE.A.2