

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. | -6 | 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. | 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 |
| 6. | $p = [4]$ $q = [21]$ | A-REI.B.4.a |
| 7. | $[0.15]x + [0.75]y \leq 30$ $[3]y \leq [1]x$ | A-CED.A.3 |

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|-------------|--|--|
| 8. | The quadrants labeled "I", "II", and "IV" should be selected. | F-BF.B.3 |
| 9. | D | A-CED.A.2 |
| 10. | $\frac{4}{7}$ | 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 A-REI.B.4.b |
| 4. | B | A1.M.7 A-CED.A.3 |
| 5. | <p><u>Sample Top Score Response</u></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 $(4, -3)$. 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>Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.</p> | A1.R.8 A-REI.A.1 A-REI.C.6 |
| 6. | C, E | A1.M.5 S-ID.B.6b |
| 7. | The range of f is all real numbers [greater than or equal to] $[-20]$. | F-IF.A.1 |
| 8. | B, G | A-REI.D.11 |

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|--------------------|-------------------|--|
| 9. | C | F-IF.B.6-2 |

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><u>Sample Top Score Response</u></p> <p>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 $k < -3$.</p> <p>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.</p> <p>Refer to the Holistic Rubric for 4-Point Reasoning Constructed Response Items for score point information.</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><u>Sample Top Score Response</u></p> <p>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.</p> <p>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.</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> <p>Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.</p> | A1.M.1 F-LE.A.1c |
| 6. | 125 | A-SSE.B.3.a |

Section 4

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|--|--|
| 1. | C | A-REI.D.10 |
| 2. | 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 |
| 3. | B | A1.M.4 F-IF.A.2 |
| 4. | B | A1.R.4 F-IF.C.9 |

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|---|--|
| 5. | <p><u>Sample Top Score Response</u></p> <p>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.</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 $15(12) + 25(8) = 380$ and if the student worked at the office for 13 hours or more, the student would earn less than \$375.</p> <p>Refer to the Holistic Rubric for 4-Point Modeling Constructed Response Items for score point information.</p> | A1.M.6 A-CED.A.3 |
| 6. | <p>For the transformation $g(x) = f(-x)$, the equation $f(x) = g(x)$ has one solution.</p> <p>For the transformation $g(x) = -f(x)$, the equation $f(x) = g(x)$ has two solutions.</p> <p>For the transformation $g(x) = f(x) + k$, where $k \neq 0$, the equation $f(x) = g(x)$ has no solutions.</p> | A1.R.10 A-REI.D.11 F-BF.B.3 |

| Item Number | Answer Key | Evidence Statement Key/ Content Scope |
|-------------|--|--|
| 7. | $x = [-16]$ $x = [2]$ or $x = [2]$ $x = [-16]$ | A-REI.B.4.b |
| 8. | D | F-LE.A.2 |