

Algebra 2 - Systems of Linear and Quadratic Equations - Test Answer Key

Common Core A-REI.C.7 · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the test on systems of linear and quadratic equations (A-REI.C.7). Each solution shows the full reasoning, and the scoring note explains how many points to award for correct setup, correct work, and a correct final answer. Partial credit rewards a sound method even when a small arithmetic slip changes the result.

Algebra 2 · Common Core State Standards: **A-REI.C.7**

Question 1 - Check a solution [2 pts]

First: $9 - 12 + 5 = 2$, true. Second: $3 - 1 = 2$, true.

Yes

Scoring: 1 point for each equation checked.

Question 2 - Substitution [3 pts]

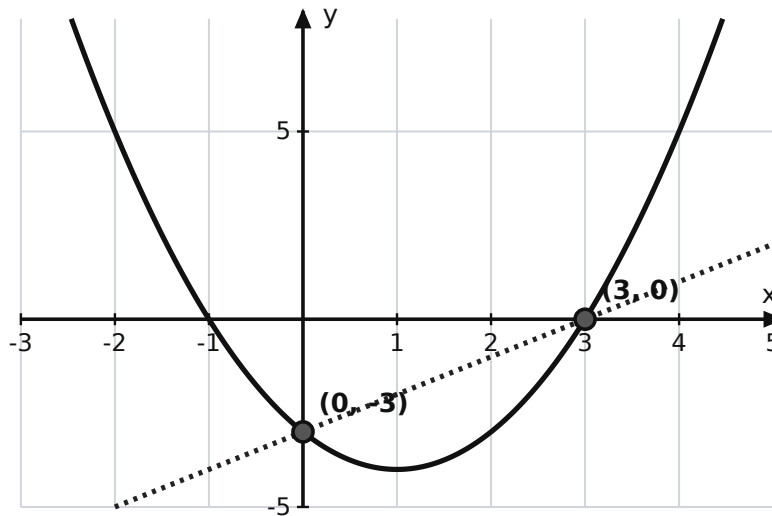
$x^2 + x - 4 = x + 1$ gives $x^2 = 5$.

$x = \pm\sqrt{5}$ and $y = x + 1 = 1 \pm\sqrt{5}$.

$(\sqrt{5}, 1 + \sqrt{5})$ **and** $(-\sqrt{5}, 1 - \sqrt{5})$

Scoring: 1 point for the substituted equation, 1 point for the x-values, 1 point for the y-values.

Question 3 - Graph and algebra [3 pts]



Intersection points.

Substitute $y = x - 3$ into $y = x^2 - 2x - 3$: $x^2 - 2x - 3 = x - 3$.

Move everything to one side: $x^2 - 3x = 0$.

Solve: $x = 0$ or $x = 3$.

Find each y with the linear equation: $y = x - 3 = -3$ when $x = 0$; $y = x - 3 = 0$ when $x = 3$.

Solutions: $(0, -3), (3, 0)$

Scoring: 1 point for the equation, 1 point for the x-values, 1 point for the points.

Question 4 - Circle and line [2 pts]

$x^2 + (x - 2)^2 = 10$ gives $2x^2 - 4x - 6 = 0$, so $x^2 - 2x - 3 = 0$.

$(x - 3)(x + 1) = 0$. $y = x - 2$: 1 or -3 .

$(3, 1)$ and $(-1, -3)$

Scoring: 1 point for the equation, 1 point for both points.

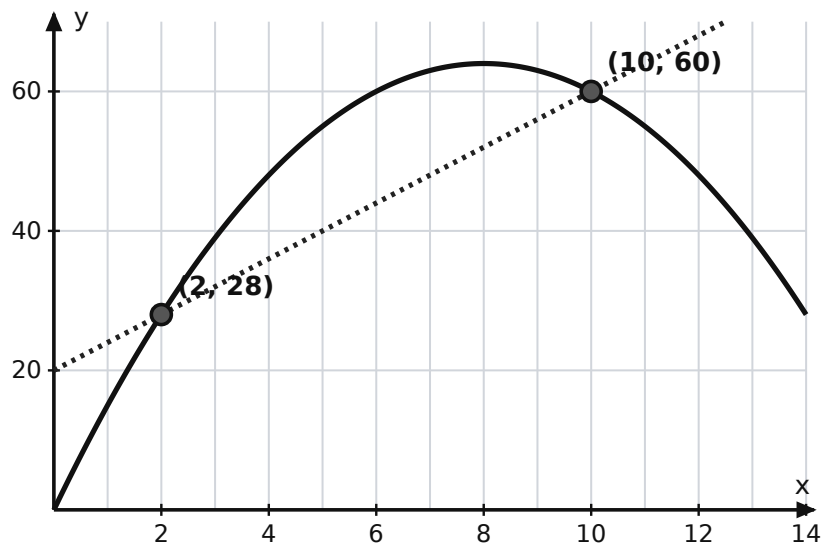
Question 5 - Number of intersections [2 pts]

$x^2 - 4 = k$ gives $x^2 = k + 4$. Two real solutions need $k + 4 \geq 0$.

$k \geq -4$

Scoring: 1 point for the equation, 1 point for the condition.

Question 6 - Break-even [2 pts]



Break-even points.

$-x^2+16x=4x+20$ gives $x^2-12x+20=0$, so $(x-2)(x-10)=0$.

x = 2 and x = 10

Scoring: 1 point for the equation, 1 point for the solutions.

Question 7 - Two numbers [2 pts]

$x-y=4$, so $x=y+4$. $y(y+4)=45$ gives $y^2+4y-45=0$, $(y+9)(y-5)=0$.

$y=5$, $x=9$ or $y=-9$, $x=-5$.

9 and 5, or -5 and -9

Scoring: 1 point for the equation, 1 point for both pairs.

Question 8 - Tangent line [2 pts]

$x^2=4x-4$ gives $x^2-4x+4=0$, so $(x-2)^2=0$. There is exactly one solution, $x=2$, with $y=4$.

Tangent at (2, 4)

Scoring: 1 point for the equation, 1 point for the conclusion with the point.

Question 9 - Find the error [2 pts]
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$x^2 - 1 = 3$ gives $x^2 = 4$, so $x = \pm 2$. Maya lost the negative solution.

(2,3) **and** (-2,3)

Scoring: 1 point for finding both x-values, 1 point for the points.

Total
20 points