Sets & Steps
Math Practice & Worked Solutions

Algebra 1

Linear-Quadratic Systems

Linear-Quadratic Systems | A1-U09-P13

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for feasible equal-output events with units, complete set of real ordered pairs, diagnosis and complete corrected ordered-pair set and complete parameter partition by 0, 1, or 2 intersections.

8 PDFs and a README; 79 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

Published by Tusils LLC.

Algebra 1

Linear-Quadratic Systems

Name: _____ **Date:** _____ **Class:** _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

$f(x) = -2x^2 - 3x + 10$ and $g(x) = -3x + 2$. Determine the complete real solution set of this line-quadratic system, then check each coordinate in both rules. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$f(x) = -2x^2 - 3x + 10$
Line rule	$g(x) = -3x + 2$
Required check	each ordered pair must satisfy both displayed rules

Bank label: _____

$f(x) = x^2 - 9x + 3$ and $g(x) = -4x + 3$. Solve for the common inputs and recover the matching output for each one. Give points, not roots alone. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$f(x) = x^2 - 9x + 3$
Line rule	$g(x) = -4x + 3$
Required check	each ordered pair must satisfy both displayed rules

Bank label: _____

$f(x) = x^2 + 4x - 7$ and $g(x) = 2x + 1$. Locate all real intersections algebraically and verify that every reported point lies on both relations. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$f(x) = x^2 + 4x - 7$
Line rule	$g(x) = 2x + 1$
Required check	each ordered pair must satisfy both displayed rules

Bank label: _____

$f(x) = -x^2 + 13$ and $g(x) = 4$. First decide whether there are zero, one, or two real intersections; then report all ordered pairs. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$f(x) = -x^2 + 13$
Line rule	$g(x) = 4$
Required check	each ordered pair must satisfy both displayed rules

Bank label: _____

Algebra 1

Linear-Quadratic Systems

Name: _____ **Date:** _____ **Class:** _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

$f(x) = 3x^2 + \frac{7}{2}x + \frac{19}{4}$ and $g(x) = \frac{1}{2}x + 2$. Locate all real intersections algebraically and verify that every reported point lies on both relations.

Quadratic rule	$f(x) = 3x^2 + \frac{7}{2}x + \frac{19}{4}$
Line rule	$g(x) = \frac{1}{2}x + 2$
Required check	each ordered pair must satisfy both displayed rules

$f(x) = -x^2 + 9x - 15$ and $g(x) = 3x - 4$. Find every ordered pair shared by the line and the parabola. Show the equation obtained by equating their outputs.

Quadratic rule	$f(x) = -x^2 + 9x - 15$
Line rule	$g(x) = 3x - 4$
Required check	each ordered pair must satisfy both displayed rules

$f(x) = \frac{3}{2}x^2 - \frac{1}{3}x - \frac{1}{4}$ and $g(x) = \frac{5}{3}x - \frac{7}{4}$. Use the most revealing exact method for the difference equation and state the full intersection set.

Quadratic rule	$f(x) = \frac{3}{2}x^2 - \frac{1}{3}x - \frac{1}{4}$
Line rule	$g(x) = \frac{5}{3}x - \frac{7}{4}$
Required check	each ordered pair must satisfy both displayed rules

Where does $x = 0$ meet $y = -x^2 + 2x + 5$? Treat the line as a fixed input rather than trying to write it as $y = mx + b$.

Quadratic rule	$y = -x^2 + 2x + 5$
Line relation	$x = 0$

Algebra 1

Linear-Quadratic Systems

Name: _____ **Date:** _____ **Class:** _____

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: points: (x: -3; y: $\frac{19}{2}$); real intersection count: 1

Find all points where $y = x^2$ reaches the horizontal line $y = 9$. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$y = x^2$
Line relation	$y = 9$

Your response: _____

Incoming: points: (x: -2; y: 5); real intersection count: 1

The line $x = \frac{1}{2}$ cannot be isolated as a y-function. Substitute its exact input into $y = 2x^2 - 3x + 1$ and report the point. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$y = 2x^2 - 3x + 1$
Line relation	$x = \frac{1}{2}$

Your response: _____

Incoming: points: (x: $-\frac{3}{2}$; y: $-\frac{17}{4}$); real intersection count: 1

Evaluate the system $y = -2x^2 + 7x - 5$ with $x = -1$. Pay attention to the signs produced by the negative fixed input. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$y = -2x^2 + 7x - 5$
Line relation	$x = -1$

Your response: _____

Incoming: points: (x: $-\frac{1}{2}$; y: $\frac{3}{2}$), (x: $\frac{1}{2}$; y: $\frac{3}{2}$); real intersection count: 2

Solve the fixed-output system formed by $y = -2x^2 + 4$ and $y = \frac{7}{2}$, giving ordered pairs exactly. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$y = -2x^2 + 4$
Line relation	$y = \frac{7}{2}$

Your response: _____

Incoming: points: (x: $\frac{1}{2}$; y: 3), (x: 2; y: 6); real intersection count: 2

Reduce or isolate the line $4x + 2y = 6$, then coordinate its outputs with $y = 2x^2 + 2x - 3$. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$y = 2x^2 + 2x - 3$
Line relation	$4x + 2y = 6$

Your response: _____

Incoming: points: ; real intersection count: 0

Report the ordered pair common to $y = -2x^2$-$x + 4$ and the non-isolated line relation $x = 1$. Match the complete ordered-pair set, or the constructed line with all requested contact points. Keep every original substitution check.

Quadratic rule	$y = -2x^2$-$x + 4$
Line relation	$x = 1$

Your response: _____

Algebra 1

Linear-Quadratic Systems

Name: _____ **Date:** _____ **Class:** _____

Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

$f(x) = x^2 + 2x - 4$ and $g(x) = x + 2$. Find every ordered pair shared by the line and the parabola. Show the equation obtained by equating their outputs. After equating the outputs as requested, choose factoring or the quadratic formula for the resulting equation. Justify the choice from its coefficients, then recover every shared ordered pair and verify both original rules.

Quadratic rule	$f(x) = x^2 + 2x - 4$
Line rule	$g(x) = x + 2$
Required check	each ordered pair must satisfy both displayed rules

---

$f(x) = -x^2 + 3x + 5$ and $g(x) = 2x - 1$. Solve for the common inputs and recover the matching output for each one. Give points, not roots alone. After equating the outputs as requested, choose factoring or the quadratic formula for the resulting equation. Justify the choice from its coefficients, then recover every shared ordered pair and verify both original rules.

Quadratic rule	$f(x) = -x^2 + 3x + 5$
Line rule	$g(x) = 2x - 1$
Required check	each ordered pair must satisfy both displayed rules

---

Linear-Quadratic Systems

Full Worked Solutions - excerpt

Worked example

Problem. Does the horizontal line $y = 3$ meet $y = x^2 - 2x + 5$ over the reals? Justify the complete intersection set.

Quadratic rule	$y = x^2 - 2x + 5$
Line relation	$y = 3$

Answer. points: ; real intersection count: 0

Explanation and check.

The horizontal condition makes $x^2 - 2x + 5 = 3$. Solving gives the listed input value (s); each has output 3.

Worked example

Problem. Where does $x = 0$ meet $y = -x^2 + 2x + 5$? Treat the line as a fixed input rather than trying to write it as $y = mx + b$.

Quadratic rule	$y = -x^2 + 2x + 5$
Line relation	$x = 0$

Answer. points: (x: 0; y: 5); real intersection count: 1

Explanation and check.

A vertical line fixes $x = 0$. Direct evaluation of the quadratic gives $y = 5$, so the unique shared point is $(0, 5)$.