

Algebra 1

Quadratic Formula

Quadratic Formula | A1-U09-P10

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
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06	Full Worked Solutions	96 solutions
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Topic focus

This topic is a focused set of 96 practice tasks on Quadratic Formula.

8 PDFs and a README; 58 buyer pages.

Algebra 1

Quadratic Formula

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.

Consider $4x^2 + 9 = 12x$ over the real numbers. Rewrite with zero on one side and identify the coefficient used for $-b$. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____	Consider $x(x - 3) = 10$ over the real numbers. Expand the product and normalize before filling the formula slots. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____
Consider $2x(x + 4) = 3$ over the real numbers. Distribute the outside factors and determine the signed constant after normalization. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____	Consider $(x - 2)(x + 5) = 7$ over the real numbers. Expand, combine the product constant with the right-side value, and then identify coefficients. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____
Consider $3(x^2 - 2) = x + 1$ over the real numbers. Remove grouping and collect both right-side terms before entering a, b, and c. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____	Consider $(x + 1)^2 = 8$ over the real numbers. Convert the square to standard zero form for a formula substitution. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____
Consider $5x^2 = 2(x + 3)$ over the real numbers. Distribute the right side and move its two terms with the correct signs. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____	Consider $0.5x^2 - 1.5x = 2$ over the real numbers. Keep the fractional coefficients rather than clearing them, and normalize c correctly. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. _____ Bank label: _____

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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.

Consider $6x - 5 = 2x^2$ over the real numbers. Place the quadratic term first without losing the signs of the other terms. _____ _____	Consider $4 - x(x + 2) = 0$ over the real numbers. Use an equivalent positive-leading normalization and state the coefficient triple it creates. _____ _____												
Consider $-(x - 4)^2 = 3x - 20$ over the real numbers. Expand the leading negative square, collect, and choose a positive-leading zero form. _____ _____	Consider $x^2 + x - 1 = 0$ over the real numbers. Round the final approximations to 2 decimal places. Report the exact pair first and then fill a hundredths-and-residual table. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="padding: 5px;">branch</th> <th style="padding: 5px;">exact root</th> <th style="padding: 5px;">rounded to 2 places</th> <th style="padding: 5px;">absolute residual</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Smaller root</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> </tr> <tr> <td style="padding: 5px;">Larger root</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> </tr> </tbody> </table> _____ _____	branch	exact root	rounded to 2 places	absolute residual	Smaller root	_____	_____	_____	Larger root	_____	_____	_____
branch	exact root	rounded to 2 places	absolute residual										
Smaller root	_____	_____	_____										
Larger root	_____	_____	_____										
Consider $2x^2 - x - 2 = 0$ over the real numbers. Round the final approximations to 2 decimal places. Approximate each branch to the nearest hundredth and substitute the rounded results. <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="padding: 5px;">branch</th> <th style="padding: 5px;">exact root</th> <th style="padding: 5px;">rounded to 2 places</th> <th style="padding: 5px;">absolute residual</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Smaller root</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> </tr> <tr> <td style="padding: 5px;">Larger root</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> <td style="padding: 5px;">_____</td> </tr> </tbody> </table> _____ _____	branch	exact root	rounded to 2 places	absolute residual	Smaller root	_____	_____	_____	Larger root	_____	_____	_____	Consider $3x^2 - 2x - 2 = 0$ over the real numbers. Round the final approximations to 2 decimal places. Simplify the exact radical before giving hundredth approximations. _____ _____
branch	exact root	rounded to 2 places	absolute residual										
Smaller root	_____	_____	_____										
Larger root	_____	_____	_____										

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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.

START Consider $8x^2 + 2x - 3 = 0$ over the real numbers. Evaluate the radical 10 and reduce the two sixteenth-denominator branches. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. Your response: _____	Incoming: $\{1, \frac{7}{2}\}$ Consider $3x^2 - 5x = 2x^2 + 6$ over the real numbers. Collect the quadratic terms first and apply the formula to the net leading coefficient. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. Your response: _____
Incoming: $\{1\}$ Consider $16x^2 + 24x + 9 = 0$ over the real numbers. Evaluate the formula at a zero discriminant with an even denominator reduction. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. Your response: _____	Incoming: $\{-1, \frac{7}{2}\}$ Consider $(3x - 2)^2 = 25$ over the real numbers. Expand the affine square and solve the resulting quadratic by the complete formula. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. Your response: _____
Incoming: $\{-2 - \sqrt{3}, -2 + \sqrt{3}\}$ Consider $2x^2 - 3x - 1 = 0$ over the real numbers. State the exact formula roots when the positive discriminant has no square factor. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. Your response: _____	Incoming: $\{-2, 3\}$ Consider $3x^2 - 12 = 0$ over the real numbers. Use $a = 3$ and $b = 0$ directly rather than simplifying the equation first. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set. Your response: _____

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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.

Consider $2x^2 + 3x - 5 = 0$ over the real numbers. Read a, b , and c with their signs, then write the full quadratic-formula substitution. Choose how to organize the arithmetic: calculate the discriminant first and then insert it, or write the complete signed formula substitution before simplifying any component. Justify your choice for these coefficients, then show the coefficients and the full formula substitution.

Consider $4x^2 - 9 = 0$ over the real numbers. Insert the absent term explicitly before setting up the formula. Choose how to organize the arithmetic: calculate the discriminant first and then insert it, or write the complete signed formula substitution before simplifying any component. Justify your choice for these coefficients, then show the coefficients and the full formula substitution.

Consider $-x^2 + 6x + 7 = 0$ over the real numbers. Keep the displayed leading sign and form the denominator $2a$. Choose how to organize the arithmetic: calculate the discriminant first and then insert it, or write the complete signed formula substitution before simplifying any component. Justify your choice for these coefficients, then show the coefficients and the full formula substitution.

Consider $3x^2 - 8x + 2 = 0$ over the real numbers. Record the coefficient triple and the unsimplified radical expression. Choose how to organize the arithmetic: calculate the discriminant first and then insert it, or write the complete signed formula substitution before simplifying any component. Justify your choice for these coefficients, then show the coefficients and the full formula substitution.

Quadratic Formula

Full Worked Solutions - excerpt

Worked example

Problem. Consider $6x - 5 = 2x^2$ over the real numbers. Place the quadratic term first without losing the signs of the other terms.

Answer. coefficients: $a: 2; b: -6; c: 5$; discriminant: -4 ; formula substitution: $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(5)}}{2(2)}$; normalized equation: $2x^2 - 6x + 5 = 0$; solutions:

Explanation and check.

Subtracting the left side from both sides gives $2x^2 - 6x + 5 = 0$, so $a = 2, b = -6, c = 5$.

Worked example

Problem. Consider $(x + 1)^2 = 8$ over the real numbers. Convert the square to standard zero form for a formula substitution. Use the quadratic formula, show your substitution and simplification, and match the complete exact real solution set.

Answer. $\{-1 + 2 \cdot \sqrt{2}, -2 \cdot \sqrt{2} - 1\}$

Explanation and check.

The signed coefficients are $a = 1, b = 2, c = -7$. In standard form, $x^2 + 2x - 7 = 0$. The discriminant is 32. Substitution in the quadratic formula gives $x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(-7)}}{2(1)}$. Expanding gives $x^2 + 2x + 1 = 8$; moving 8 left gives $c = -7$ while $b = 2$.