# **Algebra 1 Unit Test Guide**

## Quadratic Equations Unit Test

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| **Item** | **Lesson Coverage** | **Objective** | **Mathematical Practice Standard** | **Lesson Page** | **Assessment Item** |
| 1 | Lesson 2: Solution Sets of Quadratic Equations | In this section, you will determine whether given variable values make a quadratic equation true or false. | Attend to precision. | p. 2-9 | *Use the table to answer the question.*

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| --- | --- | --- | --- |
| ***x*** | **Substituted** | **Evaluate** | **True Statement?** |
| $$−\frac{3}{4}$$ |   |   |   |
| $$−\frac{1}{2}$$ |   |   |   |
| $$\frac{1}{2}$$ |   |   |   |

​For the quadratic equation $-2x^{2}-3x+2=0$, complete the table by testing each of the given values to determine whether it is a solution. Identify which one of the values is in the solution set.​Only 𝑥 = \_\_\_ is in the solution set.Answer:$$\frac{1}{2}$$[Quadratic Equations Unit Test Item #1 - GeoGebra](https://www.geogebra.org/calculator/nk4nxfbv) |
| 2 | Lesson 2: Solution Sets of Quadratic Equations | In this section, you will show that a quadratic equation can have zero, one, or two solutions. | Attend to precision. | p. 11-18 | Assuming an equation with one side as a squared variable expression and the other side as a numeric expression, which of the following statements is correct?Statement #1: If the numeric expression is zero, there are two solutions.Statement #2: If the numeric expression is zero, there is one solution.Statement #3: If the numeric expression is zero, there are no solutions.Statement # \_\_\_ is correct.Answer: 2 |
| 3 | Lesson 3: Solving Simple Quadratic Equations | In this section, you will solve quadratic equations of the form $x^{2}=number $by inspection. | Look for and make use of structure. | p. 2-9 | Solve $x^{2}=7^{8}$ by inspection. There are two real solutions. Enter the lesser number first, and use exponents in your responses.   {\_\_\_, \_\_\_}Answer:$$−7^{4}$$**;** $$7^{4}$$ |
| 4 | Lesson 3: Solving Simple Quadratic Equations | In this section, you will solve quadratic equations using square roots. | Look for and make use of structure. | p. 11-17 | Solve the following quadratic equation using square roots: $$\frac{−9+\left(x−3\right)^{2}}{−4}=−4$$Answer: {8, -2}[Quadratic Equations Unit Test Item #4 - GeoGebra](https://www.geogebra.org/calculator/rg9bjc7g) |
| 5 | Lesson 4: The Zero Product Property | In this section, you will explain how the Zero Product Property can be used to find solution sets for quadratic equations. | Look for and make use of structure. | p. 2-7 | Find the values of x that make the following equation equal zero: $(x+4) (x-2) = 0$.Answer: $$x=−4 $$and $$x=2 $$$x = 2$[Quadratic Equations Unit Test Item #5 - GeoGebra](https://www.geogebra.org/calculator/bd7uvrkr) |
| 6 | Lesson 4: The Zero Product Property | In this section, you will use the Zero Product Property to solve quadratic equations that are in factored form. | Look for and make use of structure. | p. 9-16 | Solve the factored quadratic equation $(19x-3)(9+x)=0$.Answer: The solution set is $$x=\left\{−9,\frac{3}{19}\right\}$$[Quadratic Equations Unit Test Item #6 - GeoGebra](https://www.geogebra.org/calculator/q3ayuxnr) |
| 7 | Lesson 5: Solving Quadratic Equations Using Common Factors | In this section, you will solve quadratic equations by factoring out the greatest common factor (GCF). | Look for and make use of structure. | p. 2-11 | Solve the quadratic equation $84x^{2}+16x=0$ by factoring out the GCF.Answer: The solutions are $$x=−\frac{4}{21}$$ and $$x=0 $$[Quadratic Equations Unit Test Item #7 - GeoGebra](https://www.geogebra.org/calculator/r9wymv3f) |
| 8 | Lesson 5: Solving Quadratic Equations Using Common Factors | In this section, you will solve quadratic equations by grouping. | Look for and make use of structure. | p. 13-18 | Which of the following quadratic equations is not solvable by grouping?Answer: $$2x^{2}−2x−10=0$$ |
| 9 | Lesson 6: Solving Quadratic Equations Using Patterns | In this section, you will solve quadratic equations by factoring using the sum-product pattern. | Look for and make use of structure. | p. 2-6 | Jedida solved the quadratic equation $x^{2}-96=4x$ by factoring. Her work is shown below. At which step did Jedida first make a mistake, if at all?Answer: Step 1; she added 4x to both sides instead of subtracting. |
| 10 | Lesson 6: Solving Quadratic Equations Using Patterns | In this section, you will solve quadratic equations by factoring using the perfect square trinomial pattern. | Look for and make use of structure. | p. 8-14 | Solve the following quadratic equation using the perfect square trinomial pattern: $$x^{2}+x+0.25=0$$.Answer: $$x=−0.5 $$ |
| 11 | Lesson 6: Solving Quadratic Equations Using Patterns | In this section, you will solve quadratic equations by factoring using the difference of squares pattern. | Look for and make use of structure. | p. 16-21 | Ginger was asked to solve $25x^{2}-196=0$ by factoring using the difference of squares pattern. What is/are the correct solution(s)?Answer:$$x=−\frac{14}{5},x=\frac{14}{5}$$ |
| 12 | Lesson 7: Completing the Square & the Quadratic Formula | In this section, you will complete the square to solve quadratic equations. | Look for and express regularity in repeated reasoning. | p. 2-8 | Complete the square to solve the following quadratic equation: $x^{2}-6x-20=20$.Answer: $$x=10, x=−4 $$[Quadratic Equations Unit Test Item #12 - GeoGebra](https://www.geogebra.org/calculator/xxx9vbqt) |
| 13 | Lesson 7: Completing the Square & the Quadratic Formula | In this section, you will derive the quadratic formula from the process of completing the square. | Construct viable arguments and critique the reasoning of others. | p. 10-15 | Using the quadratic formula, find the solution to $3x^{2}+18x+24=0$.Answer:$$x=−2, x=−4 $$[Quadratic Equations Unit Test Item #13 - GeoGebra](https://www.geogebra.org/calculator/ys9kcwzj) |
| 14 | Lesson 7: Completing the Square & the Quadratic Formula | In this section, you will use the quadratic formula to solve quadratic equations. | Attend to precision. | p. 17-24 | Which of the following is a solution to the quadratic equation $-x^{2}+x=-10$? Assume that the solution has been rounded to the nearest hundredth, if applicable.Answer:$$x=3.7 $$ |
| 15 | Lesson 8: Graphs of Quadratic Equations | In this section, you will generate points using quadratic equations to create corresponding graphs, called parabolas. | Model with mathematics. | p. 2-8 | Which of the following coordinate pairs is a point on the parabola $y=-4x^{2}-53x-56$?Answer: (-1, -7)[Quadratic Equations Unit Test Item #15 - GeoGebra](https://www.geogebra.org/calculator/vcqsbkca) |
| 16 | Lesson 8: Graphs of Quadratic Equations | In this section, you will identify the vertex, axis of symmetry, zeros, and *y*-intercepts of graphs of quadratic equations. | Model with mathematics. | p. 10-16 | Use the image to answer the question.Identify the vertex on the graph.Answer: (-5, 0) |
| 17 | Lesson 9: Features of Graphs of Quadratic Equations | In this section, you will use multiple methods to locate zeros of quadratic equations. | Reason abstractly and quantitatively. | p. 2-8 | Determine the zero(s) of the quadratic function $y=-5x^{2}+16x$.Answer: (0, 0) (3.2, 0)[Quadratic Equations Unit Test Item #17 - GeoGebra](https://www.geogebra.org/calculator/gzf4h7nm) |
| 18 | Lesson 9: Features of Graphs of Quadratic Equations | In this section, you will complete the square to locate the vertex and axis of symmetry of quadratic equations. | Reason abstractly and quantitatively. | p. 10-16 | Identify the vertex of $y=4(x-25)^{2}-61$.Answer: (25, -61)[Quadratic Equation Unit Test Item #18 - GeoGebra](https://www.geogebra.org/calculator/hgzrshek) |
| 19 | Lesson 9: Features of Graphs of Quadratic Equations | In this section, you will create graphs of quadratic equations. | Model with mathematics. | p. 18-24 | What are the key points on the graph of $y=x^{2}-2x-120$? Name the vertex, x-intercept(s), and y-intercept.Answer: *x*-intercepts: (-10, 0) (12, 0)*y*-intercept: (0,−120) (0,−120)vertex: (1,−121)[Quadratic Equations Unit Test Item #19 - GeoGebra](https://www.geogebra.org/calculator/smkt6xpy) |
| 20 | Lesson 4: The Zero Product Property | In this section, you will explain how the Zero Product Property can be used to find solution sets for quadratic equations. | Look for and make use of structure. | p. 2-7 | *Use the tables to answer the question.*When trying to solve the quadratic equation $x^{2}+4x-5=7$, Jamal and George each provided their work in the tables. Each said they used the Zero Product Property to solve the equation after step 2. Explain how you know the correct student’s solution is accurate and how you know the incorrect student’s solution is inaccurate.Answer: Jamal is the correct student because when you plug his solution, $x=2$, back into the original quadratic equation $x^{2}+4x-5=7$, it is accurate: $(2)^{2}+4(2)-5=7$. When you plug in his solution, $x=-6$, it is also accurate: $(-6)^{2}+4(-6)-5=7$. Jamal also used the Zero Product Property correctly by setting the equation equal to zero before writing it in factored form.George is not accurate because he cannot use the Zero Product Property if the product does not equal zero. When you plug his solutions into the original function, you get $(-5)^{2}+4(-5)-5\ne 7$ and $(1)^{2}+4(1)-5\ne 7$, which is not correct. |
| 21 | Lesson 9: Features of Graphs of Quadratic Equations | In this section, you will use multiple methods to locate zeros of quadratic equations. | Reason abstractly and quantitatively. | p. 2-8 | Determine the zero(s) of the quadratic function $y=6x^{2}+13x+5$. Show all steps.Answer:  |
| 22 | Lesson 9: Features of Graphs of Quadratic Equations | In this section, you will complete the square to locate the vertex and axis of symmetry of quadratic equations. | Reason abstractly and quantitatively. | p. 10-16 | Complete the square to determine the vertex and axis of symmetry of $y=-x^{2}+8x+7$.Answer:  |