

## Complete The Square Worksheet Answer Key PDF

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### Part 1: Building a Foundation

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**What is the purpose of completing the square in a quadratic expression?**

undefined. To factor the expression

**undefined. To transform it into a perfect square trinomial ✓**

undefined. To eliminate the constant term

undefined. To convert it into a linear equation

The purpose of completing the square is to transform a quadratic expression into a perfect square trinomial.

**What is the purpose of completing the square in a quadratic expression?**

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The purpose is to transform it into a perfect square trinomial.

**Which of the following are components of a quadratic expression?**

undefined. **Linear term** ✓

undefined. **Constant term** ✓

undefined. Cubic term

undefined. **Quadratic term** ✓

The components include linear term, constant term, and quadratic term.

**Which of the following are components of a quadratic expression?**

undefined. **Linear term** ✓

undefined. **Constant term** ✓

undefined. Cubic term

undefined. **Quadratic term** ✓

The components of a quadratic expression include the linear term, constant term, and quadratic term.

**Which of the following are components of a quadratic expression?**

undefined. **Linear term** ✓

undefined. **Constant term** ✓

undefined. Cubic term

undefined. **Quadratic term** ✓

The components include linear, constant, and quadratic terms.

**Explain the first step in the process of completing the square for the expression  $ax^2 + bx + c$ .**

**The first step is to isolate the constant term and prepare to complete the square.**

**Explain the first step in the process of completing the square for the expression  $ax^2 + bx + c$ .**

**The first step is to isolate the quadratic and linear terms and prepare to complete the square.**

**Explain the first step in the process of completing the square for the expression  $ax^2 + bx + c$ .**

**The first step is to isolate the constant term and prepare to complete the square.**

**List the forms of a quadratic equation and their purposes.**

1. Standard form:

$$ax^2 + bx + c$$

2. Vertex form:

$$a(x-h)^2 + k$$

The standard form is used for general analysis, while the vertex form is useful for graph transformations.

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The standard form is used for general analysis, while the vertex form is useful for graph transformations.

**In the expression  $x^2 + 8x + 16$ , what is the value that completes the square?**

undefined. 16

undefined. 8

**undefined. 4 ✓**

undefined. 64

The value that completes the square is 4, as it is derived from  $(8/2)^2$ .

**In the expression  $x^2 + 8x + 16$ , what is the value that completes the square?**

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undefined. 8

**undefined. 4 ✓**

undefined. 64

The value that completes the square is 4.

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undefined. 16

undefined. 8

**undefined. 4 ✓**

undefined. 64

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## Part 2: comprehension and Application

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**What is the vertex of the quadratic function after completing the square for  $x^2 + 6x + 9$ ?**

**undefined. (3, 0) ✓**

undefined. (-3, 0)

undefined. (0, 3)

undefined. (0, -3)

The vertex of the function is (3, 0) after completing the square.

**What is the vertex of the quadratic function after completing the square for  $x^2 + 6x + 9$ ?**

**undefined. (3, 0) ✓**

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The vertex is (3, 0).

**What is the vertex of the quadratic function after completing the square for  $x^2 + 6x + 9$ ?**

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The vertex is (3, 0).

**Which of the following statements are true about completing the square?**

undefined. It changes the roots of the quadratic equation.

**undefined. It helps in finding the vertex of a parabola. ✓**

**undefined. It can be used to solve quadratic equations. ✓**

undefined. It eliminates the linear term.

Completing the square helps in finding the vertex and can be used to solve quadratic equations.

**Which of the following statements are true about completing the square?**

undefined. It changes the roots of the quadratic equation.

**undefined. It helps in finding the vertex of a parabola. ✓**

**undefined. It can be used to solve quadratic equations. ✓**

undefined. It eliminates the linear term.

True statements include finding the vertex and solving quadratic equations.

**Which of the following statements are true about completing the square?**

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**undefined. It helps in finding the vertex of a parabola. ✓**

**undefined. It can be used to solve quadratic equations. ✓**

undefined. It eliminates the linear term.

True statements include that it helps in finding the vertex and can be used to solve quadratic equations.

**Describe how completing the square can be used to convert a quadratic equation into vertex form.**

**Completing the square allows you to rewrite the quadratic in vertex form, highlighting the vertex's coordinates.**

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**Completing the square allows you to rewrite the quadratic in vertex form, highlighting the vertex.**

**Complete the square for the expression  $x^2 + 10x + 24$  and identify the constant term added inside the square.**

undefined. 25 ✓

undefined. 5

undefined. 10

undefined. 20

The constant term added inside the square is 25, derived from  $(10/2)^2$ .

**Complete the square for the expression  $x^2 + 10x + 24$  and identify the constant term added inside the square.**

undefined. 25 ✓

undefined. 5

undefined. 10

undefined. 20

The constant term added is 25.

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undefined. 25 ✓

undefined. 5

undefined. 10

undefined. 20

The constant term added is 25.

**Which of the following expressions are equivalent to  $(x+4)^2 - 16$ ?**

undefined.  $x^2 + 8x$  ✓

undefined.  $x^2 + 8x + 16$

undefined.  $x^2 + 8x - 16$

undefined.  $x^2 + 16x + 16$

The equivalent expression is  $x^2 + 8x$ , as it simplifies correctly.

**Which of the following expressions are equivalent to  $(x+4)^2 - 16$ ?**

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undefined.  $x^2 + 8x + 16$

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undefined.  $x^2 + 16x + 16$

The equivalent expression is  $x^2 + 8x$ .

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undefined.  $x^2 + 16x + 16$

The equivalent expression is  $x^2 + 8x$ .

**Apply the method of completing the square to solve the quadratic equation  $x^2 + 4x - 5 = 0$ .**

**To solve, complete the square to find the roots of the equation.**

**Apply the method of completing the square to solve the quadratic equation  $x^2 + 4x - 5 = 0$ .**

**Completing the square will yield the solutions for  $x$ .**

**Apply the method of completing the square to solve the quadratic equation  $x^2 + 4x - 5 = 0$ .**

**Completing the square will lead to the solutions of the equation.**

### Part 3: Analysis, Evaluation, and Creation

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**When completing the square for  $2x^2 + 8x + 6$ , what is the first step to simplify the process?**

undefined. Add 4 to both sides

undefined. **Factor out 2 from the quadratic and linear terms** ✓

undefined. Subtract 6 from both sides

undefined. Divide the entire equation by 2

The first step is to factor out 2 from the quadratic and linear terms.

**When completing the square for  $2x^2 + 8x + 6$ , what is the first step to simplify the process?**

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undefined. Divide the entire equation by 2

The first step is to factor out 2 from the quadratic and linear terms.

**Analyze the steps involved in completing the square for  $x^2 + 12x + 36$ . Which steps are correct?**

undefined. Divide all terms by 2

undefined. Add and subtract 36 inside the expression

**undefined. Rewrite as  $(x+6)^2$  ✓**

**undefined. Simplify to find the vertex form ✓**

The correct steps include rewriting as  $(x+6)^2$  and simplifying to find the vertex form.

**Analyze the steps involved in completing the square for  $x^2 + 12x + 36$ . Which steps are correct?**

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undefined. Add and subtract 36 inside the expression

**undefined. Rewrite as  $(x+6)^2$  ✓**

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Correct steps include rewriting as  $(x+6)^2$ .



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**undefined. Rewrite as  $(x+6)^2$  ✓**

**undefined. Simplify to find the vertex form ✓**

Correct steps include rewriting as  $(x+6)^2$ .

**Analyze the expression  $x^2 + 14x + 49$  and explain why it is already a perfect square trinomial.**

**The expression is a perfect square trinomial because it can be expressed as  $(x+7)^2$ .**

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**It is a perfect square trinomial because it can be expressed as  $(x+7)^2$ .**

**Which scenarios would benefit most from using the completing the square method?**

**undefined. Finding the vertex of a parabola ✓**

**undefined. Solving a quadratic equation with complex roots ✓**

undefined. Simplifying quadratic expressions for integration

undefined. Converting a quadratic to standard form

Scenarios that benefit include finding the vertex of a parabola and solving quadratics with complex roots.

**Which scenarios would benefit most from using the completing the square method?**

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Scenarios include finding the vertex of a parabola and solving quadratic equations with complex roots.

**Which scenarios would benefit most from using the completing the square method?**

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Scenarios include finding the vertex of a parabola and solving quadratic equations with complex roots.

**Create a real-world problem that involves a quadratic equation, and demonstrate how completing the square can be used to solve it.**

**A real-world problem could involve projectile motion, where completing the square helps find maximum height.**

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**A real-world problem could involve projectile motion, and completing the square can help find maximum height.**

**Design a quadratic expression that, when completed to a square, results in the vertex form  $(x-2)^2 + 3$ .**

1. Expression:

$$x^2 - 4x + 7$$

2. Steps to complete the square:

**1. Take half of -4, square it to get 4. 2. Add and subtract 4.**

The expression could be  $x^2 - 4x + 7$ , which completes to  $(x-2)^2 + 3$ .

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1. Expression:

$$x^2 - 4x + 7$$

2. Steps to complete the square:

**1. Take half of -4, square it, and add/subtract 4.**

The expression could be  $x^2 - 4x + 7$ .