Completing the Square to Derive the Quadratic Formula

$$ax^2 + bx + c = 0$$

Follow the steps to derive the Quadratic Formula by completing the square.

Start with $ax^2 + bx + c = 0$

1. Move the constant term to the right side by itself, nothing else can be on the right side.

2. Divide everything on both sides by a so that the coefficient of the x^2 term is 1.

3. Divide the coefficient of the x term by 2 and then square the result. This is the number you need to add to both sides to complete the square.

4. Add that number to both sides of the equation.

5. Factor the left side of the equation.

6. Give the terms on the right side the same denominator and add them together.

7. Take the square root of both sides.

8. Rewrite the square root of the right side as the square root of the numerator divided by the square root of the denominator.

9. Simplify the square root of the denominator, the square root of the numerator can't be simplified.

10. Get the x term by itself.

11. Add the fractions on the right side after giving them the same denominator.

12. You are finished!!!!