

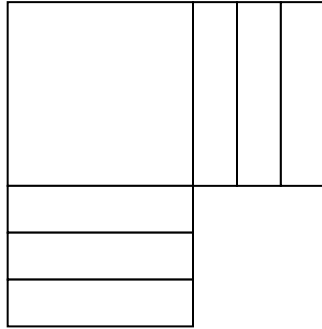
Example 4

Solve the quadratic equation.

$$x^2 - 14x + 49 = 0$$

Completing the Square

$$x^2 + 6x + \underline{\quad} = (x + \underline{\quad})^2$$



Example 3

Changing standard form into vertex form

$$y = x^2 - 12x + 39$$

- Step 1: Move the constant to other side with y .
- Step 2: Divide both sides by the leading coefficient if it is greater than 1.
- Step 3: Complete the square; remember to add the same value to both sides of the equation.
- Step 4: Factor the perfect square trinomial into the square of a binomial.
- Step 5: Solve for y .

Example 1

Find c to form a perfect square trinomial, then rewrite as the square of a binomial.

To complete the square: $ax^2 + bx + c$

Step 1: Find half the coefficient of x and square it. $c = \left(\frac{b}{2}\right)^2$

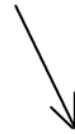
Step 2: Replace c with that value and factor the perfect square trinomial. $(\sqrt{ax^2} + \sqrt{c})^2$
 $(\sqrt{ax^2} - \sqrt{c})^2$

A] $x^2 + 18x + c$

B] $x^2 - 5x + c$

C] $25x^2 + 20x + c$

But what if the LC isn't 1? Divide out the LC first.



Example 2

Solve a quadratic equation by completing the square

$$x^2 + 6x + 3 = 0$$

- Step 1: Divide out the leading coefficient if greater than 1.
- Step 2: Move all variables to one side of the equal sign and the constant to the other.
- Step 3: Complete the square; remember to add the same value to both sides of the equation.
- Step 4: Factor the perfect square trinomial.
- Step 5: Solve using the square root method.
- Step 6: Simplify and check.