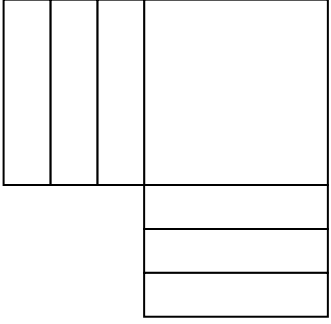


Example 4

Solve the quadratic equation.

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



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

Completing
the
Square

Changing standard form
into vertex form

Example 3

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

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: $ax^2 + bx + c$
<u>Step 1:</u> Find half the coefficient of x and square it. $c = \left(\frac{b}{2}\right)^2$
<u>Step 2:</u> Replace c with that value and factor the perfect square trinomial. $(\sqrt{ax^2 + \sqrt{c}})^2$

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.

Solve a quadratic equation by completing the square

Example 2

$$0 = 51 + 6x + 3x^2$$

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.

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