

# Solving by completing the square

*SWBAT solve quadratic equations by completing the square.*

You can change the expression  $x^2 + bx$  into a perfect-square trinomial by adding \_\_\_\_\_. This process is called \_\_\_\_\_. The process is the same whether  $b$  is \_\_\_\_\_ or \_\_\_\_\_.

**Example 1:** Finding  $c$  to complete the square.

What is the value of  $c$  that  $x^2 - 16x + c$  is a perfect square trinomial?

**Practice:**

a.  $x^2 + 18x + c$

b.  $z^2 + 22z + c$

c.  $p^2 - 30p + c$

d.  $k^2 - 5k + c$

e.  $g^2 + 17g + c$

f.  $q^2 - 4q + c$

**Example 2:** Solve  $x^2 + bx = c$

What are the solutions of the equation  $x^2 + 6x = 216$ ?

**Your turn:**  $t^2 - 6t = 247$

To solve an equation in the form  $x^2 + bx + c = 0$ , first \_\_\_\_\_ the constant term  $c$  from \_\_\_\_\_ of the equation.

**Example 3:** Solving  $x^2 + bx + c = 0$

What are the solutions of the equation  $x^2 - 14x + 16 = 0$

**Your turn:**  $x^2 + 9x + 15$

**Practice**

a.  $g^2 + 7g = 144$

b.  $r^2 - 4r = 30$

c.  $m^2 + 16m = -59$

d.  $a^2 - 2a - 35 = 0$

e.  $m^2 + 12m + 19 = 0$

f.  $w^2 - 14w + 13 = 0$

**Example 4:** Real World Problems

**Gardening** You are planning a flower garden consisting of three square plots surrounded by a 1-ft border. The total area of the garden and the border is  $100 \text{ ft}^2$ . What is the side length  $x$  of each square plot?

 Red tulips  Yellow tulips

