



Factoring patterns

Take out a common factor

every term shares a factor — pull it out front.

$$6x + 9 = 3(2x + 3)$$

the most take the biggest factor they all share.

$$12x^2 + 8x = 4x(3x + 2)$$

Difference of two squares

$a^2 - b^2$ becomes $(a + b)(a - b)$.

$$x^2 - 25 = (x + 5)(x - 5)$$

only if both terms are perfect squares, with a minus.

$$4x^2 - 9 = (2x + 3)(2x - 3)$$

Perfect square trinomial

$a^2 + 2ab + b^2$ becomes $(a + b)^2$.

$$x^2 + 6x + 9 = (x + 3)^2$$

$a^2 - 2ab + b^2$ becomes $(a - b)^2$.

$$x^2 - 10x + 25 = (x - 5)^2$$

Trinomial $x^2 + bx + c$

1. find two numbers that add to b and multiply to c .

$$\text{for } x^2 + 5x + 6: 2 + 3 = 5 \text{ and } 2 \times 3 = 6$$

2. write them as $(x + \text{first})(x + \text{second})$.

$$x^2 + 5x + 6 = (x + 2)(x + 3)$$