

Factoring Trinomials

9th Grade

Two numbers that multiply to c and add to b — and when a is not 1.

For $x^2 + bx + c$, find two numbers whose product is c and whose sum is b . Those numbers go in the brackets.

$$x^2 + bx + c = (x + p)(x + q)$$

$$x^2 + 7x + 12$$

$$(x+3)(x+4)$$

$$3 \times 4 = 12 \text{ and } 3 + 4 = 7$$

$$x^2 - 5x + 6$$

$$(x-2)(x-3)$$

Both negative: product positive, sum negative.

$$x^2 + x - 12$$

$$(x+4)(x-3)$$

Opposite signs because c is negative.

$$2x^2 + 7x + 3$$

$$(2x+1)(x+3)$$

When $a \neq 1$, split the middle term or use trial factors.

THE COMMON MISTAKE

$$\times x^2 - 5x + 6 = (x+2)(x+3)$$

$$\checkmark (x-2)(x-3)$$

A positive c with a negative b means both numbers are negative.

Sign check: c positive means both same sign. c negative means opposite signs.