

Factoring Patterns Cheat Sheet

A printable factoring patterns cheat sheet covering greatest common factors, difference of squares, perfect-square trinomials, general trinomials, and

Greatest common factor

$$ab + ac = a(b+c)$$

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

Difference of squares

$$a^2-b^2 = (a-b)(a+b)$$

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

Perfect-square sum

$$a^2+2ab+b^2=(a+b)^2$$

Perfect-square difference

$$a^2-2ab+b^2=(a-b)^2$$

Sum of cubes

$$a^3+b^3=(a+b)(a^2-ab+b^2)$$

Difference of cubes

$$a^3-b^3=(a-b)(a^2+ab+b^2)$$

Monic trinomial

$$x^2+bx+c=(x+m)(x+n)$$

$$x^2+7x+12=(x+3)(x+4)$$

General trinomial

$$ax^2+bx+c=(px+q)(rx+s)$$

$$6x^2+7x+2=(3x+2)(2x+1)$$

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01 Start here

Remove every factor shared by all terms.

Greatest common factor

$$\mathbf{ab + ac = a(b+c)}$$

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

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02 Special products

These patterns factor immediately when every condition matches.

Difference of squares

$$a^2 - b^2 = (a - b)(a + b)$$

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

Perfect-square sum

$$a^2 + 2ab + b^2 = (a + b)^2$$

Perfect-square difference

$$a^2 - 2ab + b^2 = (a - b)^2$$

Sum of cubes

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

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02 Special products (continued)

These patterns factor immediately when every condition matches.

Difference of cubes

$$\mathbf{a^3 - b^3 = (a - b)(a^2 + ab + b^2)}$$

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03 Trinomials

Use multiplication to verify the middle term.

Monic trinomial

$$x^2 + bx + c = (x + m)(x + n)$$

Example: $x^2 + 7x + 12 = (x + 3)(x + 4)$

General trinomial

$$ax^2 + bx + c = (px + q)(rx + s)$$

Example: $6x^2 + 7x + 2 = (3x + 2)(2x + 1)$

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HOW TO REMEMBER IT

GCF first, pattern second, multiply to check

1

A difference of squares must have subtraction and two perfect squares.

2

Perfect-square trinomials have matching outer squares and twice their product in the middle.

3

For ax^2+bx+c , the inner and outer products must combine to b .