

SKILL #16

CODE: FT.1

Factoring Trinomials ($x^2 + bx + c$)

Core Concept

When it looks like $x^2 + bx + c$

(meaning the number in front of x^2 is just 1),

we have a special way to factor it!

Dealing with Signs

The signs of b and c tell you a lot about your "magic numbers":

- If c is positive (+): Both magic numbers have the same sign as b.
- If c is negative (-): The two magic numbers have different signs.
 - The larger number will have the same sign as b.

Examples

Example 1: Factor: $x^2 + 5x + 6$

STEP 1: $c = 6, b = 5$

--> Two numbers: 2 and 3

$$2 \cdot 3 = 6 \quad \checkmark \qquad 2 + 3 = 5 \quad \checkmark$$

STEP 2: Factors --> $(x + 2)(x + 3)$

Example 2: Factor: $x^2 - 7x + 12$

STEP 1: $c = 12, b = -7$

--> Two numbers: -4 and -3

$$-4(-3) = 12 \quad \checkmark \qquad -4 + (-3) = -7 \quad \checkmark$$

STEP 2: Factors --> $(x - 4)(x - 3)$

Additional Resources



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GULDEN RULE

This is a special type of trinomial that looks like:

$$x^2 + bx + c$$

We want to factor it into:

$$(x + m)(x + n)$$

Where m and n are numbers that:

- Multiply to c
- Add to b

When to use it?

When the expression has three terms: $x^2 + bx + c$

When the coefficient of x^2 is 1

When solving quadratic equations

When factoring expressions for graphing or simplifying

[MORE EXAMPLES](#)

⚠ Common Mistakes to Avoid

✗ Trying to factor trinomials like $2x^2 + 5x + 3$

using this method (use this method only if it's in the form $(x^2 + bx + c)$).

✗ Stopping after testing just one pair of factors for c .

List all factor pairs of c before checking sums.

✗ Ignoring signs. Always double-check if your magic numbers multiply to the correct c (including its sign)

AND add to the correct b (including its sign).