SKILL #17

CODE: FT.2

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

Core Concept

Factoring trinomials like $(ax^2 + bx + c)$ where $a \neq 1$ requires finding two binomials whose product matches the original. Unlike Skill 16, the coefficient of x^2 is no longer 1, adding complexity.

When to use it?

- When the expression has three terms: $ax^2 + bx + c$
- When factoring trinomials with $a > 1$
- When solving quadratic equations

Steps to Solve

MORE EXAMPLES

Example: Factor $2x^2 + 7x + 3$:

STEP 1: $a = 2$, $b = 7$, $c = 3$ --> we can't use direct factoring (skill 16)

STEP 2: multiply a by c --> $2(3) = 6$

STEP 3: Find the two numbers when multiplied you have 6 and when added you have 7.

STEP 4: Two numbers --> $6 \; and \; 1$. $6(1) = (6)$ ✅ $6 + 1 = 7$ ✅

STEP 5: Rewrite the middle term using these numbers --> middle term $(7x)$ ----------(rewrite)----------> $6x + x$

STEP 6: $2x^2 + 6x + x + 3$ --> factor by grouping --> $(2x^2 + 6x) + (x + 3)$ --> $2x(x + 3) + (x + 3)$

STEP 7: Common binomial $(x + 3)$ ----------> $(x + 3)(2x + 1)$

Quick Tips

- Always check if there's a GCF for the whole trinomial before starting.
- List all factor pairs of a × c to find the correct numbers.
- If grouping doesn't work, try different factor pairs or check your numbers.

Common Mistakes to Avoid

- ❌ Forgetting to Multiply $a \times c$.
- ❌ Choosing wrong pair of numbers (don't guess!).
- ❌ Forgetting to factor out GCF if all terms have one.
- ❌ Incorrect signs or wrong grouping.

Additional Resources

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