

## 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

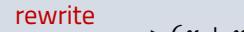
Example: Factor  $2x^2 + 7x + 3$ :

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 ( $7x$ )   $6x + x$

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  $a \times c$  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

