

Review of Factoring (All Methods)



Always check for a GCF (Greatest Common Factor) first!

Example: $10x^4 + 22x^3 + 2x^2$ GCF: $2x^2$

$$\frac{10x^4}{2x^2} + \frac{22x^3}{2x^2} + \frac{2x^2}{2x^2}$$

$$= 2x^2(5x^2 + 11x + 1)$$



Grouping Method: used when there are 4 terms.

Example	$(4x^2 - 44x - x + 11)$
1. Group the first 2 & last 2 terms.	
2. Factor out a GCF from each group.	$4x(x-11) - 1(x-11)$
3. Write the final answer as a product of the factors.	$(4x-1)(x-11)$



Trinomials where $a=1$.

Find two numbers that multiply to c and add up to b .

Example: $x^2 + 2x - 15$

$$(x-3)(x+5)$$



Trinomials where $a > 1$.

Find two numbers that multiply to ac and add up to b .

Then, use the Grouping method to factor completely.

Example: $2x^2 + 17x + 21$

$$\frac{42}{14} \quad \frac{17}{3}$$

$$(2x^2 + 14x)(x + 21)$$

$$2x(x+7) + 3(x+7) \quad (2x+3)(x+7)$$



Difference of Perfect Squares: used when there is one perfect square being Subtracted from another ($a^2 - b^2$).

Your answer will be in the form $(a+b)(a-b)$.

Example: $x^2 - 16$

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



Sum & Difference of Perfect Cubes: used when there is one perfect cube being added or Subtracted from another.

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

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

REMEMBER: Same

Opposite

Always

Positive

Example: $8x^3 + 1 = (2x+1)(4x^2 - 2x + 1)$

$$a = 2x$$

$$b = 1$$

Mixed Practice

$$4x^2 - 25$$

$$(2x-5)(2x+5)$$

$$x^3 - 27$$

$$(x-3)(x^2+3x+9)$$

$$x^6 - 26x^3 - 27$$

$$(x^3-27)(x^3+1)$$

$$(x-3)(x^2+3x+9)(x+1)(x^2-x+1)$$

$$125x^2 + 400xy + 320y^2$$

$$25x^2 + 80xy + 64y^2$$

$$5(5x+8y)(5x+8y) = 5(5x+8y)^2$$