

Factoring Map

Always look for a **GCF** **FIRST!**

4 terms

2 terms

3 terms

Factor by GROUPING

Example: $2x^3 + 5x^2 - 8x - 20$

$$2x^3 + 5x^2 - 8x - 20$$

$$x^2(2x + 5) - 4(2x + 5)$$

$$(x^2 - 4)(2x + 5)$$

Be sure to check each binomial for D.O.S. to make sure you are done!

* $(x^2 - 4) = (x + 2)(x - 2)$

So final answer is:

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

Is it a Difference of Squares?

NO...

Example: $2x^2 - 8$

$2x(x - 4)$

You are done!

YES...

Example: $2x^3 - 72x$

$$2x(x^2 - 36)$$

$x^2 - 36$ is a D.O.S.

$$2x(x + 6)(x - 6)$$

Be sure to check each binomial for D.O.S. **AGAIN** to make sure you are done!

If "a" \neq 1

If "a" = 1

Is it a Special Polynomial?

This is an Easy Factor!

Example: $x^2 + 3x - 54$

What 2 numbers multiply to make -54 and add to make +3?.....+9,-6

$(x + 9)(x - 6)$

YES...

The "a" and "c" terms are both perfect squares, so it must be a **Perfect Square Trinomial!**

Make 2 sets of parentheses, and fill in the "firsts" and "lasts" to create the perfect square terms when you FOIL...be sure to check your middle term to make sure it works!

Example: $4x^2 + 12x + 9$

$(2x)^2 = 4x^2$ and $(3)^2 = 9$

Answer: $(2x + 3)(2x + 3)$

NO...

Factor using "Super Cool" method

Example: $2x^2 - 5x - 12$ $(a)(c) = (2)(-12) = -24$

$$2x^2 - 8x + 3x - 12$$

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$$2x(x - 4) + 3(x - 4)$$

$$(2x + 3)(x - 4)$$