Factoring

① GCF → Greatest Common Factor

★ Always look for GCF first

EX) $10x^2 + 22x + 2$

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

EX) $3x^3 + 9x^2 - 81x$

$3x(x^2 + 3x - 27)$

② Difference of Squares

★ subtraction

★ 2 perfect squares

EX) $x^2 - 16 = (x-4)(x+4)$

$x \quad 4$

EX) $y^2 - 81 = (y-9)(y+9)$

$y \quad 9$

EX) $64 - z^2 = (8-z)(8+z)$

$8 \quad z$

EX) $x^6 - y^4 = (x^3+y^2)(x^3-y^2)$

$x^3 \quad y^2$

EX) $32y^2 - 50$

$2(16y^2 - 25)$

$4y \quad 5$

→ $2(4y-5)(4y+5)$

③ Grouping
~~4~~ 4 terms

Ex) $4x^2 - 44x - x + 11$

$(4x^2 - 44x) + (-x + 11)$

$4x(x - 11) - 1(x - 11)$

$\boxed{(4x - 1)(x - 11)}$

$(4x-1)(x-11)$

$(x-11)(4x) + (x-11)(-1)$

Ex) $x^2 + 3x + xk + 3k$

$(x^2 + 3x) + (xk + 3k)$

$x(x+3) + k(x+3)$

$\boxed{(x+k)(x+3)}$

Ex) $2a^2 - 4a + 2ad - 4d$

$2(a^2 - 2a + ad - 2d)$

$2((a^2 - 2a) + (ad - 2d))$

$2(a(a-2) + d(a-2))$

$\boxed{2(a+d)(a-2)}$

(4) Trinomials

↳ $ax^2 + bx + c$ (where $a = 1$), so $x^2 + bx + c$

Ex) $x^2 + 2x - 15$

↑ Add ↑ Mult.

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

Mult. to -15	Add to 2
-1, 15	14 ✗
-3, 5	2 ✓