FACTORING

Square of difference of two terms

$$(a-b)^2 = (a^2 - 2ab + b^2)$$

$$(\square - \square)^2 = (\square^2 - 2\square\square + \square^2)$$

Ex) $(x-2)^2 = (x^2 - 2x(2) + 2^2)$

$= x^2 - 4x + 4$

Square of sum of two terms

$$(a+b)^2 = (a^2 + 2ab + b^2)$$

$$(\square + \square)^2 = (\square^2 + 2\square\square + \square^2)$$

Ex) $(x+2)^2 = x^2 + 2x(2) + 2^2$

$= x^2 + 4x + 4$

Difference of two squares

$$(a^2 - b^2) = (a-b)(a+b)$$

$$(\square^2 - \square^2) = (\square - \square)(\square + \square)$$

Ex) $(x^2 - 4) \Rightarrow (x^2 - 2^2)$

$= (x-2)(x+2)$

Sum of two cubes

$$(a^3 + b^3) = (a+b)(a^2 - ab + b^2)$$

$$(\square^3 + \square^3) = (\square + \square)(\square^2 - \square\square + \square^2)$$

Ex) $(x^3+8) \Rightarrow (x^3 + 2^3)$

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

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

Difference of two cubes

$$(a^3 - b^3) = (a-b)(a^2 + ab + b^2)$$

$$(\square^3 - \square^3) = (\square - \square)(\square^2 + \square\square + \square^2)$$

Ex) $(x^3 - 8) \Rightarrow (x^3 - 2^3) = (x-2)(x^2 + 2x + 4)$

Cube of the sum of two terms

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(\square + \square)^3 = \square^3 + 3\square^2\square + 3\square\square^2 + \square^3$$

Ex) $(x+y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$

Cube of the difference of two terms

$$(a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$(\square - \square)^3 = \square^3 - 3\square^2\square + 3\square\square^2 - \square^3$$

Ex) $(x-y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$