

1.5 Difference of Cubes

Sum/Difference of Perfect Cubes Pattern

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

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

Multiply: $(a - b)(a^2 + ab + b^2)$

$$a^3 + \cancel{a^2b} + \cancel{ab^2} - \cancel{a^2b} - \cancel{ab^2} - b^3$$

$$a^3 - b^3$$

Multiply: $(a + b)(a^2 - ab + b^2)$

$$\begin{array}{l} xy \quad 3 \\ x^3y^3 - 27 \end{array}$$

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

Ex) Factor.

$$\begin{array}{l} x \quad 2 \\ x^3 - 8 \end{array}$$

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

$$\begin{array}{l} 2x \quad 3 \\ 8x^3 + 27 \end{array}$$

$$(2x + 3)(4x^2 - 6x + 9)$$

$$\begin{array}{l} 6x \quad 5 \\ 216x^3 + 125 \end{array}$$

$$(6x + 5)(36x^2 - 30x + 25)$$

$$\begin{array}{l} 4x^3 \quad 32 \quad 2 \\ 4(x^3 - 8) \end{array}$$

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

$$\begin{array}{l} ay^3 + 125a \\ a(y^3 + 125) \end{array}$$

$$a(y + 5)(y^2 - 5y + 25)$$