

## 5-5A Factoring Sums and Differences of Perfect Cubes

1st 10 perfect cubes:  $1, 8, 27, 64, 125, 216, 343, 512, 729, 1000$

variable perfect cubes:  $X^3, X^6, X^9, X^{12}, \dots, X^{300}$

$$\sqrt[3]{-27} \Rightarrow (-3)$$

$$X^3, X^6, X^9, X^{12}, \dots, X^{300}$$

$$\sqrt[3]{125} = 5$$

Sum of Perfect Cubes:

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



$$125 = 5^3 = 5^2 \cdot 5 = 25 \cdot 5$$

Difference of Perfect Cubes:

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

Factor the following perfect cubes.

1.  $\sqrt[3]{x^3 - 27}$

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

$$\begin{array}{r} x^3 + 3x^2 + 9x - 27 \\ -3x^2 - 9x \\ \hline \end{array}$$

2.  $(m^6 + 125)$

$$(m^2 + 5)(m^4 - 5m^2 + 25)$$

3.  $(2n^3 + 128)$

$$2(n^3 + 64)$$

$$2(n+4)(n^2 - 4n + 16)$$

4.  $\sqrt[3]{27x^9 - 216}$

$$27(x^3 - 8)$$

$$27(x-2)(x^2 + 2x + 4)$$

$$\textcircled{3} (3x^3 - 6) (9x^6 + 18x^3 + 36)$$

$$\textcircled{9}$$

# 5-5A Worksheet

