

# Factoring Perfect Cubes

10/16

Sum of cubes

2 perfect cubes  
Addition

$$x^3 + 8$$

$$a^3 + b^3$$

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

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

① Cube root of 1<sup>st</sup> term

② Cube root of 2<sup>nd</sup> term

③ Same sign as original problem

④ Square "a"

⑤ Opposite sign from orig problem

⑥ Multiply a · b

⑦ last sign is always positive

⑧ Square "b"

Difference of cubes

2 perfect cubes  
Subtraction

$$x^3 - 8$$

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

$$\begin{array}{r} x^3 + 64 \\ \underline{(x+4)} \phantom{+ 64} \\ x^2 - 4x + 16 \end{array}$$

$$250x^3 - 54$$

$$\begin{array}{l} 2 \cdot 27 \\ 18 \cdot 3 \\ a \cdot 6 \end{array}$$

$$2(125x^3 - 27)$$

$$2(5x-3)(25x^2+15x+9)$$

$$\begin{array}{l} 27 - x^3 \\ (3-x)(9+3x+x^2) \end{array}$$