

2.5

- 1) $a^3 - 8 = a^3 - 2^3 = (a - 2)(a^2 + 2a + 4)$
- 2) $8a^3 - b^3 = (2a)^3 - b^3 = (2a - b)(4a^2 + 2ab + b^2)$
- 3) $x^3 - 1 = x^3 - 1^3 = (x - 1)(x^2 + x + 1)$
- 4) $a^3 + 1 = a^3 + 1^3 = (a + 1)(a^2 - a + 1)$
- 5) $a^3 + 6a^2 + 12a + 8 = a^3 + 3a^2 \cdot 2 + 3a \cdot 2^2 + 2^3 = (a + 2)^3$
- 6) $a^3 - 3a^2 + 3a - 1 = a^3 - 3a^2 \cdot 1 + 3a \cdot 1^2 - 1^3 = (a - 1)^3$
- 7) $8x^3 - 27 = (2x)^3 - 3^3 = (2x - 3)(4x^2 + 6x + 9)$
- 8) $x^3y^3 - 1 = (xy)^3 - 1^3 = (xy - 1)(x^2y^2 + xy + 1)$
- 9) $1 - 64a^3 = 1^3 - (4a)^3 = (1 - 4a)(1 + 4a + 16a^2)$
- 10) $8a^3 + 12a^2 + 6a + 1 = (2a)^3 + 3 \cdot (2a)^2 \cdot 1 + 3 \cdot 2a \cdot 1^2 + 1^3 = (2a + 1)^3$
- 11) $8a^3 + 36a^2b + 27b^3 + 54ab^2 = 8a^3 + 36a^2b + 54ab^2 + 27b^3 = (2a)^3 + 3 \cdot (2a)^2 \cdot 3b + 3 \cdot 2a \cdot (3b)^2 + (3b)^3 = (2a + 3b)^3$
- 12) $a^3 - 8b^3c^6 = a^3 - (2bc^2)^3 = (a - 2bc^2)(a^2 + 2abc^2 + 4b^2c^4)$
- 13) $64a^6 + 144a^4 + 27 + 108a^2 = 64a^6 + 144a^4 + 108a^2 + 27 = (4a^2)^3 + 3 \cdot (4a^2)^2 \cdot 3 + 3 \cdot 4a^2 \cdot 3^2 + 3^3 = (4a^2 + 3)^3$
- 14) $x^9 - 1 = (x^3)^3 - 1^3 = \underbrace{(x^3 - 1)}_{x^3 - 1^3} (x^6 + x^3 + 1) = (x - 1)(x^2 + x + 1)(x^6 + x^3 + 1)$
- 15) $125x^6 + 8 = (5x^2)^3 + 2^3 = (5x^2 + 2)(25x^4 - 10x^2 + 4)$