



Exercise 2J

Question 12:

$$\begin{aligned} & 2a^3 + 16b^3 - 5a - 10b \\ &= 2(a^3 + 8b^3) - 5(a + 2b) \\ &= 2[(a)^3 + (2b)^3] - 5(a + 2b) \\ &= 2(a + 2b)[(a)^2 - a(2b) + (2b)^2] - 5(a + 2b) \\ &\text{Since } a^3 + b^3 = (a + b)(a^2 - ab + b^2) \\ &= (a + 2b)[2(a^2 - 2ab + 4b^2) - 5] \end{aligned}$$

Question 13:

$$\begin{aligned} & x^3 - 512 \\ &= (x)^3 - (8)^3 \\ &= (x - 8)[(x)^2 + x(8) + (8)^2] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= (x - 8)(x^2 + 8x + 64). \end{aligned}$$

Question 14:

$$\begin{aligned} & 64x^3 - 343 \\ &= (4x)^3 - (7)^3 \\ &= (4x - 7)[(4x)^2 + 4x(7) + (7)^2] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= (4x - 7)(16x^2 + 28x + 49). \end{aligned}$$

Question 15:

$$\begin{aligned} & 1 - 27x^3 \\ &= (1)^3 - (3x)^3 \\ &= (1 - 3x)[(1)^2 + 1(3x) + (3x)^2] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= (1 - 3x)(1 + 3x + 9x^2). \end{aligned}$$

Question 16:

$$\begin{aligned} & 1 - 27x^3 \\ &= (1)^3 - (3x)^3 \\ &= (1 - 3x)[(1)^2 + 1(3x) + (3x)^2] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= (1 - 3x)(1 + 3x + 9x^2). \end{aligned}$$

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