



Exercise 2J

Question 21:

We know that,

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

Therefore,

$$\begin{aligned} & (a + b)^3 - (a - b)^3 \\ &= [a + b - (a - b)] [(a + b)^2 + (a + b)(a - b) + (a - b)^2] \\ &= (a + b - a + b) [a^2 + b^2 + 2ab + a^2 - b^2 + a^2 + b^2 - 2ab] \\ &= 2b (3a^2 + b^2). \end{aligned}$$

Question 22:

$$\begin{aligned} & x - 8xy^3 \\ &= x (1 - 8y^3) \\ &= x [(1)^3 - (2y)^3] \\ &= x (1 - 2y) [(1)^2 + 1(2y) + (2y)^2] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= x (1 - 2y) (1 + 2y + 4y^2). \end{aligned}$$

Question 23:

$$\begin{aligned} & 32x^4 - 500x \\ &= 4x (8x^3 - 125) \\ &= 4x [(2x)^3 - (5)^3] \\ &= 4x [(2x - 5) [(2x)^2 + 2x(5) + (5)^2]] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= 4x (2x - 5) (4x^2 + 10x + 25). \end{aligned}$$

Question 24:

$$\begin{aligned} & 3a^7b - 81a^4b^4 \\ &= 3a^4b (a^3 - 27b^3) \\ &= 3a^4b [(a)^3 - (3b)^3] \\ &= 3a^4b (a - 3b) [(a)^2 + a(3b) + (3b)^2] \\ &\text{Since } a^3 - b^3 = (a - b)(a^2 + ab + b^2) \\ &= 3a^4b (a - 3b) (a^2 + 3ab + 9b^2). \end{aligned}$$

***** END *****