

RD SHARMA

Solutions

Class 9 Maths

Chapter 5

Ex 5.3

$$Q 1. 64a^3 + 125b^3 + 240a^2b + 300ab^2$$

SOLUTION :

$$= (4a)^3 + (5b)^3 + 3(4a)^2(5b) + 3(4a)(5b)^2$$

$$[\because a^3 + b^3 + 3a^2b + 3ab^2 = (a + b)^3]$$

$$= (4a + 5b)^3$$

$$= (4a + 5b)(4a + 5b)(4a + 5b)$$

$$\therefore 64a^3 + 125b^3 + 240a^2b + 300ab^2 = (4a + 5b)(4a + 5b)(4a + 5b)$$

$$Q 2. 125x^3 - 27y^3 - 225x^2y + 135xy^2$$

SOLUTION :

$$= (5x)^3 - (3y)^3 - 3(5x)^2(3y) + 3(5x)(3y)^2 \quad [\because a^3 - b^3 - 3a^2b + 3ab^2 = (a - b)^3]$$

$$= (5x - 3y)^3$$

$$= (5x - 3y)(5x - 3y)(5x - 3y)$$

$$\therefore 125x^3 - 27y^3 - 225x^2y + 135xy^2 = (5x - 3y)(5x - 3y)(5x - 3y)$$

$$Q 3. \frac{8}{27}x^3 + 1 + \frac{4}{3}x^2 + 2x$$

SOLUTION :

$$= \left(\frac{2}{3}x\right)^3 + 1^3 + 3 \times \left(\frac{2}{3}x\right)^2 \times 1 + 3(1)^2 \times \left(\frac{2}{3}x\right)$$

$$= \left(\frac{2}{3}x + 1\right)^3 \quad [\because x^3 + b^3 + 3x^2b + 3xb^2 = (x + b)^3]$$

$$= \left(\frac{2}{3}x + 1\right)\left(\frac{2}{3}x + 1\right)\left(\frac{2}{3}x + 1\right)$$

$$\therefore \frac{8}{27}x^3 + 1 + \frac{4}{3}x^2 + 2x = \left(\frac{2}{3}x + 1\right)\left(\frac{2}{3}x + 1\right)\left(\frac{2}{3}x + 1\right)$$

$$Q 4. 8x^3 + 27y^3 + 36x^2y + 54xy^2$$

SOLUTION :

$$= (2x)^3 + (3y)^3 + 3 \times (2x)^2 \times 3y + 3 \times (2x)(3y)^2$$

$$= (2x + 3y)^3 \quad [\because$$

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

$$=(2x + 3y)(2x + 3y)(2x + 3y)$$

$$\therefore 8x^3 + 27y^3 + 36x^2y + 54xy^2 = (2x + 3y)(2x + 3y)(2x + 3y)$$

$$Q 5. a^3 - 3a^2b + 3ab^2 - b^3 + 8$$

SOLUTION :

$$=(a - b)^3 + 2^3 \quad [\because a^3 - b^3 - 3a^2b + 3ab^2 = (a - b)^3]$$

$$=(a - b + 2)((a - b)^2 - (a - b)2 + 2^2) \quad \because [a^3 + b^3 = (a + b)(a^2 - ab + b^2)]$$

$$=(a - b + 2)(a^2 + b^2 - 2ab - 2(a - b) + 4)$$

$$=(a - b + 2)(a^2 + b^2 - 2ab - 2a + 2b + 4)$$

$$\therefore a^3 - 3a^2b + 3ab^2 - b^3 + 8 = (a - b + 2)(a^2 + b^2 - 2ab - 2a + 2b + 4)$$

$$Q 6. x^3 + 8y^3 + 6x^2y + 12xy^2$$

SOLUTION :

$$=(x)^3 + (2y)^3 + 3 \times x^2 \times 2y + 3 \times x \times (2y)^2$$

$$=(x + 2y)^3 \quad [\because x^3 + y^3 + 3x^2y + 3xy^2 = (x + y)^3]$$

$$=(x + 2y)(x + 2y)(x + 2y)$$

$$\therefore x^3 + 8y^3 + 6x^2y + 12xy^2 = (x + 2y)(x + 2y)(x + 2y)$$

$$Q 7. 8x^3 + y^3 + 12x^2y + 6xy^2$$

SOLUTION :

$$=(2x)^3 + (y)^3 + 3 \times (2x)^2 \times y + 3(2x) \times y^2$$

$$=(2x + y)^3 \quad [\because a^3 + b^3 + 3a^2b + 3ab^2 = (a + b)^3]$$

$$=(2x + y)(2x + y)(2x + y)$$

$$\therefore 8x^3 + y^3 + 12x^2y + 6xy^2 = (2x + y)(2x + y)(2x + y)$$

$$Q 8. 8a^3 + 27b^3 + 36a^2b + 54ab^2$$

SOLUTION :

$$=(2a)^3 + (3b)^3 + 3 \times (2a)^2 \times 3b + 3 \times 2a \times (3b)^2$$

$$= (2a + 3b)^3 \quad [\because a^3 + b^3 + 3a^2b + 3ab^2 = (a + b)^3]$$

$$= (2a + 3b)(2a + 3b)(2a + 3b)$$

$$\therefore 8a^3 + 27b^3 + 36a^2b + 54ab^2 = (2a + 3b)(2a + 3b)(2a + 3b)$$

$$Q 9. 8a^3 - 27b^3 - 36a^2b + 54ab^2$$

SOLUTION :

$$= (2a)^3 - (3b)^3 - 3 \times (2a)^2 \times 3b + 3 \times 2a \times (3b)^2$$

$$= (2a - 3b)^3 \quad [\because a^3 - b^3 - 3a^2b + 3ab^2 = (a - b)^3]$$

$$= (2a - 3b)(2a - 3b)(2a - 3b)$$

$$\therefore 8a^3 - 27b^3 - 36a^2b + 54ab^2 = (2a - 3b)(2a - 3b)(2a - 3b)$$

$$Q 10. x^3 - 12x(x - 4) - 64$$

SOLUTION :

$$= x^3 - 12x^2 + 48x - 64$$

$$= x^3 - 3 \times x^2 \times 4 + 3 \times 4^2 \times x - 4^3$$

$$= (x - 4)^3 \quad [\because a^3 - b^3 - 3a^2b + 3ab^2 = (a - b)^3]$$

$$= (x - 4)(x - 4)(x - 4)$$

$$\therefore x^3 - 12x(x - 4) - 64 = (x - 4)(x - 4)(x - 4)$$

$$Q 11. a^3x^3 - 3a^2bx^2 + 3ab^2x - b^3$$

SOLUTION :

$$= (ax)^3 - 3(ax)^2 \times b + 3(ax) \times b^2 - b^3$$

$$= (ax - b)^3 \quad [\because a^3 - b^3 - 3a^2b + 3ab^2 = (a - b)^3]$$

$$= (ax - b)(ax - b)(ax - b)$$

$$\therefore a^3x^3 - 3a^2bx^2 + 3ab^2x - b^3 = (ax - b)(ax - b)(ax - b)$$