

Mathematics

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(Chapter – 2) (Polynomials)(Exemplar Problems)

(Class – IX)

Exercise 2.3

Question 39:

Find the value of

(i). $x^3 + y^3 - 12xy + 64$ when $x + y = -4$

(ii). $x^3 - 8y^3 - 36xy - 216$ when $x = 2y + 6$

Answer 39:

(i). Given that: $x + y = -4$

$$\Rightarrow x + y + 4 = 0 \quad \dots (i)$$

Now $x^3 + y^3 - 12xy + 64 = x^3 + y^3 + 4^3 - 3(x)(y)(4)$

$$= (x + y + 4)[x^2 + y^2 + 4^2 - (x)(y) - (y)(4) - (4)(x)]$$

$$[\because a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)]$$

$$= (0)[x^2 + y^2 + 4^2 - (x)(y) - (y)(4) - (4)(x)]$$



$$[\because x + y + 4 = 0, \text{ From (i)}]$$

$$= 0$$

(ii). Given that: $x = 2y + 6$

$$\Rightarrow x - 2y - 6 = 0 \quad \dots (i)$$

Now $x^3 - 8y^3 - 36xy - 216 = x^3 + (-2y)^3 + (-6)^3 - 3(x)(-2y)(-6)$

$$= (x - 2y - 6)[x^2 + (-2y)^2 + (-6)^2 - (x)(-2y) - (-2y)(-6) - (-6)(x)]$$

$$[\because a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)]$$

$$= (0)[x^2 + (-2y)^2 + (-6)^2 - (x)(-2y) - (-2y)(-6) - (-6)(x)]$$

$$[\because x - 2y - 6 = 0, \text{ From (i)}]$$

$$= 0$$

