

# Mathematics

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

## Exercise 2.3

### Question 36:

Factorise:

(i).  $a^3 - 8b^3 - 64c^3 - 24abc$

(ii).  $2\sqrt{2}a^3 + 8b^3 - 27c^3 + 18\sqrt{2}abc$

### Answer 36:

(i). Given that:  $a^3 - 8b^3 - 64c^3 - 24abc$

$$= (a)^3 + (-2b)^3 + (-4c)^3 - 3(a)(-2b)(-4c)$$

$$= [a + (-2b) + (-4c)][(a)^2 + (-2b)^2 + (-4c)^2 - (a)(-2b) - (-2b)(-4c) - (-4c)(a)]$$

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

$$= (a - 2b - 4c)(a^2 + 4b^2 + 16c^2 + 2ab - 8bc + 4ca)$$

(ii). Given that:  $2\sqrt{2}a^3 + 8b^3 - 27c^3 + 18\sqrt{2}abc$

$$= (\sqrt{2}a)^3 + (2b)^3 + (-3c)^3 - 3(\sqrt{2}a)(2b)(-3c)$$

$$= [\sqrt{2}a + (2b) + (-3c)][(\sqrt{2}a)^2 + (2b)^2 + (-3c)^2 - (\sqrt{2}a)(2b) - (2b)(-3c) - (-3c)(\sqrt{2}a)]$$

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

$$= (\sqrt{2}a + 2b - 3c)(2a^2 + 4b^2 + 9c^2 - 2\sqrt{2}ab + 6bc + 3\sqrt{2}ca)$$

