



Factorisation of Algebraic Expressions Ex 5.2 Q4

Answer :

The given expression to be factorized is

$$8x^3y^3 + 27a^3$$

This can be written in the form

$$8x^3y^3 + 27a^3 = (2xy)^3 + (3a)^3$$

Recall the formula for sum of two cubes

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

Using the above formula, we have

$$\begin{aligned} 8x^3y^3 + 27a^3 &= (2xy + 3a)\{(2xy)^2 - 2xy \cdot 3a + (3a)^2\} \\ &= (2xy + 3a)(4x^2y^2 - 6axy + 9a^2) \end{aligned}$$

We cannot further factorize the expression.

So, the required factorization of $8x^3y^3 + 27a^3$ is $(2xy + 3a)(4x^2y^2 - 6axy + 9a^2)$.

Factorisation of Algebraic Expressions Ex 5.2 Q5

Answer :

The given expression to be factorized is

$$64a^3 - b^3$$

This can be written in the form

$$64a^3 - b^3 = (4a)^3 - (b)^3$$

Recall the formula for difference of two cubes

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

Using the above formula, we have

$$\begin{aligned} 64a^3 - b^3 &= (4a - b)\{(4a)^2 + 4a \cdot b + (b)^2\} \\ &= (4a - b)(16a^2 + 4ab + b^2) \end{aligned}$$

We cannot further factorize the expression.

So, the required factorization of $64a^3 - b^3$ is $(4a - b)(16a^2 + 4ab + b^2)$.

Factorisation of Algebraic Expressions Ex 5.2 Q6

Answer :

The given expression to be factorized is

$$\frac{x^3}{216} - 8y^3$$

This can be written in the form

$$\frac{x^3}{216} - 8y^3 = \left(\frac{x}{6}\right)^3 - (2y)^3$$

Recall the formula for difference of two cubes

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

Using the above formula, we have

$$\begin{aligned}\frac{x^3}{216} - 8y^3 &= \left(\frac{x}{6} - 2y\right) \left\{ \left(\frac{x}{6}\right)^2 + \frac{x}{6} \cdot 2y + (2y)^2 \right\} \\ &= \left(\frac{x}{6} - 2y\right) \left(\frac{x^2}{36} + \frac{xy}{3} + 4y^2\right)\end{aligned}$$

We cannot further factorize the expression.

So, the required factorization of $\frac{x^3}{216} - 8y^3$ is $\boxed{\left(\frac{x}{6} - 2y\right) \left(\frac{x^2}{36} + \frac{xy}{3} + 4y^2\right)}$.

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