



Factorisation of Algebraic Expressions Ex 5.1 Q1

Answer :

The given expression to be factorized is

$$x^3 + x - 3x^2 - 3$$

Take common x from the first two terms and -3 from the last two terms. That is

$$x^3 + x - 3x^2 - 3 = x(x^2 + 1) - 3(x^2 + 1)$$

Finally, take common $x^2 + 1$ from the two terms. That is

$$\begin{aligned} x^3 + x - 3x^2 - 3 &= x(x^2 + 1) - 3(x^2 + 1) \\ &= (x^2 + 1)(x - 3) \end{aligned}$$

We cannot further factorize the expression.

So, the required factorization is $x^3 + x - 3x^2 - 3 = \boxed{(x^2 + 1)(x - 3)}$.

Factorisation of Algebraic Expressions Ex 5.1 Q2

Answer :

The given expression to be factorized is

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

Take common $a(a + b)$ from the two terms. That is

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

Expand the term $(a + b)^2$ within the second braces.

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

We cannot further factorize the expression.

So, the required factorization of $a(a + b)^3 - 3a^2b(a + b)$ is $\boxed{a(a + b)(a^2 + b^2 - ab)}$.

Factorisation of Algebraic Expressions Ex 5.1 Q3

Answer :

The given expression to be factorized is

$$x(x^3 - y^3) + 3xy(x - y)$$

We know that

$$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$$

The given expression then becomes

$$x(x - y)(x^2 + xy + y^2) + 3xy(x - y)$$

Take common $x(x - y)$ from the two terms. That is

$$\begin{aligned} x(x - y)(x^2 + xy + y^2) + 3xy(x - y) &= x(x - y)\{(x^2 + xy + y^2) + 3y\} \\ &= x(x - y)(x^2 + xy + y^2 + 3y) \\ &= x(x - y)(x^2 + xy + y^2 + 3y) \end{aligned}$$

We cannot further factorize the expression.

So, the required factorization of $x(x^3 - y^3) + 3xy(x - y)$ is $\boxed{x(x - y)(x^2 + xy + y^2 + 3y)}$.

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