Factorisation of Algebraic Expressions Ex 5.1 Q16

Answer :

The given expression to be factorized is

$a^2+2ab+b^2-c^2$

This can be arrange in the form

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

Substituting $x=(a+b)$ in the above expression, we get.

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

Put $x=(a+b)$.

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

We cannot further factorize the expression.

So, the required factorization of $a^2+2ab+b^2-c^2$ is $(a+b+c)(a+b-c)$.

Factorisation of Algebraic Expressions Ex 5.1 Q17

Answer :

The given expression to be factorized is

$a^2+4b^2-4ab-4c^2$

This can be arrange in the form

$$a^2+4b^2-4ab-4c^2$$
$$=(a^2-4ab+4b^2)-4c^2$$
$$=\{(a)^2-2.a.2b+(2b)^2\}-4c^2$$
$$=(a-2b)^2-4c^2$$

Substitute $x=(a-2b)$.

$$\begin{aligned} a^2+4b^2-4ab-4c^2 &= x^2-4c^2 \\ &= x^2-(2c)^2 \\ &= (x+2c)(x-2c) \end{aligned}$$

Put $x=(a-2b)$.

$$\begin{aligned} a^2+4b^2-4ab-4c^2 &= \{(a-2b)+2c\}\{(a-2b)-2c\} \\ &= (a-2b+2c)(a-2b-2c) \end{aligned}$$

We cannot further factorize the expression.

So, the required factorization of $a^2+4b^2-4ab-4c^2$ is $\boxed{(a-2b+2c)(a-2b-2c)}$.

Factorisation of Algebraic Expressions Ex 5.1 Q18

Answer :

The given expression to be factorized is

$xy^9 - yx^9$

This can be written in the form

$xy^9 - yx^9 = x.y.y^8 - y.x.x^8$

Take common xy from the two terms of the above expression

$$\begin{aligned} xy^9 - yx^9 &= xy(y^8 - x^8) \\ &= xy(y^8 - x^8) \\ &= xy\{(y^4)^2 - (x^4)^2\} \\ &= xy(y^4 + x^4)(y^4 - x^4) \\ xy^9 - yx^9 &= xy(y^4 + x^4)\{(y^2)^2 - (x^2)^2\} \\ &= xy(y^4 + x^4)(y^2 + x^2)(y^2 - x^2) \\ &= xy(y^4 + x^4)(y^2 + x^2)\{(y)^2 - (x)^2\} \\ &= xy(y^4 + x^4)(y^2 + x^2)(y + x)(y - x) \end{aligned}$$

We cannot further factorize the expression.

So, the required factorization of $xy^9 - yx^9$ is $\boxed{xy(y^4 + x^4)(y^2 + x^2)(y + x)(y - x)}$

*********** END **********