

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.

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

$$=(x+c)(x-c)$$

Put x = (a+b).

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

= (a+b+c)(a+b-c)

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).

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

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

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

We cannot further factorize the expression.

So, the required factorization of $a^2 + 4b^2 - 4ab - 4c^2$ is (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

$$xy^{9} - yx^{9} = xy(y^{8} - x^{8})$$

$$= xy(y^{8} - x^{8})$$

$$= xy\{(y^{4})^{2} - (x^{4})^{2}\}$$

$$= xy(y^{4} + x^{4})(y^{4} - x^{4})$$

$$xy^{9} - yx^{9} = xy(y^{4} + x^{4})\{(y^{2})^{2} - (x^{2})^{2}\}$$

$$= xy(y^{4} + x^{4})(y^{2} + x^{2})(y^{2} - x^{2})$$

$$= xy(y^{4} + x^{4})(y^{2} + x^{2})\{(y)^{2} - (x)^{2}\}$$

$$= xy(y^{4} + x^{4})(y^{2} + x^{2})(y + x)(y - x)$$

We cannot further factorize the expression.

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

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