

Factorisation of Algebraic Expressions Ex 5.2 Q16

Answer:

The given expression to be factorized is

$$x^3 y^3 + 1$$

This can be written as

$$x^3 y^3 + 1 = (xy)^3 + (1)^3$$

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

$$= (xy+1)\{(xy)^2 - xy \cdot 1 + (1)^2\}$$

$$=(xy+1)(x^2y^2-xy+1)$$

We cannot further factorize the expression.

So, the required factorization of
$$x^3y^3 + 1$$
 is $(xy+1)(x^2y^2 - xy + 1)$

Factorisation of Algebraic Expressions Ex 5.2 Q17

Answer

The given expression to be factorized is

$$x^4y^4 - xy$$

Take common xy. Then we have from the above expression,

$$x^4y^4 - xy = xy(x^3y^3 - 1)$$

This can be written as

$$x^{4}y^{4} - xy = xy\{(xy)^{3} - (1)^{3}\}$$

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

$$x^{4}y^{4} - xy = xy(xy - 1)\{(xy)^{2} + xy \cdot 1 + (1)^{2}\}$$
$$= xy(xy - 1)(x^{2}y^{2} + xy + 1)$$

We cannot further factorize the expression.

So, the required factorization of
$$x^4y^4 - xy$$
 is $xy(xy-1)(x^2y^2 + xy + 1)$

Factorisation of Algebraic Expressions Ex 5.2 Q18

Answer:

The given expression to be factorized is

$$a^{12} + b^{12}$$

This can be written as

$$a^{12} + b^{12} = (a^4)^3 + (b^4)^3$$

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

$$a^{12} + b^{12} = (a^4 + b^4)\{(a^4)^2 - a^4 \cdot b^4 + (b^4)^2\}$$
$$= (a^4 + b^4)(a^8 - a^4 b^4 + b^8)$$

We cannot further factorize the expression.

So, the required factorization of $a^{12} + b^{12}$ is $(a^4 + b^4)(a^8 - a^4b^4 + b^8)$

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