Factorisation of Algebraic Expressions Ex 5.3 Q1

Answer :

The given expression to be factorized is $64a^3+125b^3+240a^2b+300ab^2$

This can be written in the form $64a^3+125b^3+240a^2b+300ab^2=(4a)^3+(5b)^3+240a^2b+300ab^2$

Take common $60ab$ from the last two terms,

$64a^3+125b^3+240a^2b+300ab^2=(4a)^3+(5b)^3+60ab(4a+5b)$

This can be written in the following form

$64a^3+125b^3+240a^2b+300ab^2=(4a)^3+(5b)^3+3.4a.5b(4a+5b)$

Recall the formula for the cube of the sum of two numbers

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

Using the above formula, we have

$64a^3+125b^3+240a^2b+300ab^2=(4a+5b)^3$

We cannot further factorize the expression.

So, the required factorization of $64a^3+125b^3+240a^2b+300ab^2$ is $\boxed{(4a+5b)^3}$.

Factorisation of Algebraic Expressions Ex 5.3 Q2

Answer :

The given expression to be factorized is $125x^3-27y^3-225x^2y+135xy^2$

This can be written in the form $125x^3-27y^3-225x^2y+135xy^2=(5x)^3-(3y)^3-225x^2y+135xy^2$

Take common $-45xy$ from the last two terms,. Then we get $125x^3-27y^3-225x^2y+135xy^2$

$=(5x)^3-(3y)^3-45xy(5x-3y)$

This can be written in the following form $125x^3-27y^3-225x^2y+135xy^2$

$=(5x)^3-(3y)^3-3.5x.3y(5x-3y)$

Recall the formula for the cube of the difference of two numbers $(a-b)^3=a^3-b^3-3ab(a-b)$

Using the above formula, we have

$125x^3-27y^3-225x^2y+135xy^2=(5x-3y)^3$

We cannot further factorize the expression.

So, the required factorization is of $125x^3-27y^3-225x^2y+135xy^2$ is $\boxed{(5x-3y)^3}$.

Factorisation of Algebraic Expressions Ex 5.3 Q3

Answer :

The given expression to be factorized is

$$\frac{8}{27}x^3+1+\frac{4}{3}x^2+2x$$

This can be written in the form

$$\frac{8}{27}x^3+1+\frac{4}{3}x^2+2x=\left(\frac{2}{3}x\right)^3+(1)^3+\frac{4}{3}x^2+2x$$

Take common $2x$ from the last two terms,. Then we get

$$\frac{8}{27}x^3+1+\frac{4}{3}x^2+2x=\left(\frac{2}{3}x\right)^3+(1)^3+2x(\frac{2}{3}x+1)$$

This can be written in the following form

$$\frac{8}{27}x^3+1+\frac{4}{3}x^2+2x=\left(\frac{2}{3}x\right)^3+(1)^3+3.\frac{2}{3}x.1(\frac{2}{3}x+1)$$

Recall the formula for the cube of the sum of two numbers

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

Using the above formula, we have

$$\frac{8}{27}x^3+1+\frac{4}{3}x^2+2x=(\frac{2}{3}x+1)^3$$

We cannot further factorize the expression.

So, the required factorization is of $\frac{8}{27}x^3+1+\frac{4}{3}x^2+2x$ is $\boxed{(\frac{2}{3}x+1)^3}$.

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