Factorisation of Algebraic Expressions Ex 5.1 Q28

Answer :

The given expression to be factorized is

$$21x^2 - 2x + \frac{1}{21}$$

This can be written in the form

$$21x^2 - 2x + \frac{1}{21} = (\sqrt{21}x)^2 - 2x + \left(\frac{1}{\sqrt{21}}\right)^2$$

$$= (\sqrt{21}x)^2 - 2 \cdot \sqrt{21}x \cdot \frac{1}{\sqrt{21}} + \left(\frac{1}{\sqrt{21}}\right)^2$$

$$= \left(\sqrt{21}x - \frac{1}{\sqrt{21}}\right)^2$$

We cannot further factorize the expression.

So, the required factorization of $21x^2 - 2x + \frac{1}{21}$ is $\boxed{\left(\sqrt{21}x - \frac{1}{\sqrt{21}}\right)^2}$.

Factorisation of Algebraic Expressions Ex 5.1 Q29

Answer :

The given expression to be factorized is

$$5\sqrt{5}x^2 + 20x + 3\sqrt{5}$$

This can be written in the form

$$5\sqrt{5}x^2 + 20x + 3\sqrt{5} = 5\sqrt{5}x^2 + (15+5)x + 3\sqrt{5}$$

$$= 5\sqrt{5}x^2 + 15x + 5x + 3\sqrt{5}$$

Take common $5x$ from the first two terms and $\sqrt{5}$ from the last two terms,

$$5\sqrt{5}x^2 + 20x + 3\sqrt{5} = 5x(\sqrt{5}x + 3) + \sqrt{5}(\sqrt{5}x + 3)$$

Finally take common $(\sqrt{5}x + 3)$ from the above expression,

$$5\sqrt{5}x^2 + 20x + 3\sqrt{5} = (\sqrt{5}x + 3)(5x + \sqrt{5})$$

We cannot further factorize the expression.

So, the required factorization of $5\sqrt{5}x^2 + 20x + 3\sqrt{5}$ is $\boxed{(\sqrt{5}x + 3)(5x + \sqrt{5})}$.

Factorisation of Algebraic Expressions Ex 5.1 Q30

Answer :

The given expression to be factorized is

$$2x^2 + 3\sqrt{5}x + 5$$

This can be written in the form

$$2x^2 + 3\sqrt{5}x + 5 = 2x^2 + (2\sqrt{5} + \sqrt{5})x + 5$$
$$= 2x^2 + 2\sqrt{5}x + \sqrt{5}x + 5$$

Take common $2x$ from the first two terms and $\sqrt{5}$ from the last two terms,

$$2x^2 + 3\sqrt{5}x + 5 = 2x(x + \sqrt{5}) + \sqrt{5}(x + \sqrt{5})$$

Finally take common $(x + \sqrt{5})$ from the above expression,

$$2x^2 + 3\sqrt{5}x + 5 = (x + \sqrt{5})(2x + \sqrt{5})$$

We cannot further factorize the expression.

So, the required factorization of $2x^2 + 3\sqrt{5}x + 5$ is $\boxed{(x + \sqrt{5})(2x + \sqrt{5})}$.

Factorisation of Algebraic Expressions Ex 5.1 Q31

Answer :

The given expression to be factorized is

$$9(2a - b)^2 - 4(2a - b) - 13$$

Substituting $x = (2a - b)$ in the above expression, we get

$$9(2a - b)^2 - 4(2a - b) - 13 = 9x^2 - 4x - 13$$

This can be written in the form

$$9x^2 - 4x - 13 = 9x^2 - 13x + 9x - 13$$

Take common x from the first two terms and 1 from the last two terms,

$$9(2a - b)^2 - 4(2a - b) - 13 = x(9x - 13) + 1(9x - 13)$$

Finally take common $(9x - 13)$ from the above expression,

$$9(2a - b)^2 - 4(2a - b) - 13 = (9x - 13)(x + 1)$$

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

$$9(2a - b)^2 - 4(2a - b) - 13 = \{9(2a - b) - 13\}\{(2a - b) + 1\}$$
$$= \{(18a - 9b) - 13\}\{(2a - b) + 1\}$$
$$= (18a - 9b - 13)(2a - b + 1)$$

We cannot further factorize the expression.

So, the required factorization of $9(2a - b)^2 - 4(2a - b) - 13$ is $\boxed{(18a - 9b - 13)(2a - b + 1)}$.

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