Factorisation of Algebraic Expressions Ex 5.1 Q7

Answer:

The given expression to be factorized is

$6ab - b^2 + 12ac - 2bc$

Take common b from the first two terms and $2c$ from the last two terms. That is

$6ab - b^2 + 12ac - 2bc = b(6a - b) + 2c(6a - b)$

Finally, take common $(6a - b)$ from the two terms. That is

$6ab - b^2 + 12ac - 2bc = b(6a - b) + 2c(6a - b)$
$\qquad\qquad\qquad\qquad\qquad\ = (6a - b)(b + 2c)$

We cannot further factorize the expression.

So, the required factorization of $6ab - b^2 + 12ac - 2bc$ is $\boxed{(6a - b)(b + 2c)}$.

Factorisation of Algebraic Expressions Ex 5.1 Q8

Answer:

The given expression to be factorized is

$$\left(x^2 + \frac{1}{x^2}\right) - 4\left(x + \frac{1}{x}\right) + 6$$

We have

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

$$\Rightarrow \left(x + \frac{1}{x}\right)^2 = x^2 + 2 + \frac{1}{x^2}$$

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

Use the above result in the original expression to get

$$\left(x^2 + \frac{1}{x^2}\right) - 4\left(x + \frac{1}{x}\right) + 6 = \left(x + \frac{1}{x}\right)^2 - 2 - 4\left(x + \frac{1}{x}\right) + 6$$

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

Substituting $a = \left(x + \frac{1}{x}\right)$ in the above, we get

$$a^2 - 4a + 4 = (a)^2 - 2.a.2 + (2)^2$$
$$= (a-2)^2$$

Put $a = \left(x + \dfrac{1}{x}\right)$.

$$\left(x^2 + \dfrac{1}{x^2}\right) - 4\left(x + \dfrac{1}{x}\right) + 6 = (x + \dfrac{1}{x} - 2)^2$$

We cannot further factorize the expression.

So, the required factorization of $\left(x^2 + \dfrac{1}{x^2}\right) - 4\left(x + \dfrac{1}{x}\right) + 6$ is $\boxed{(x + \dfrac{1}{x} - 2)^2}$.

Factorisation of Algebraic Expressions Ex 5.1 Q9

Answer :

The given expression to be factorized is

$$x(x-2)(x-4) + 4x - 8$$

Take common 4 from the last two terms. That is

$$x(x-2)(x-4) + 4x - 8 = x(x-2)(x-4) + 4(x-2)$$

Again take common $(x-2)$ from the two terms of the above expression.

$$x(x-2)(x-4) + 4x - 8 = x(x-2)(x-4) + 4(x-2)$$
$$= (x-2)\{x(x-4) + 4\}$$
$$= (x-2)\{(x^2 - 4x) + 4\}$$
$$= (x-2)\{(x)^2 - 2.x.2 + (2)^2\}$$
$$= (x-2)(x-2)^2$$
$$= (x-2)^3$$

We cannot further factorize the expression.

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

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