

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

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

$$=(6a-b)(b+2c)$$

We cannot further factorize the expression.

So, the required factorization of $6ab - b^2 + 12ac - 2bc$ is (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

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

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

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

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

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

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

We cannot further factorize the expression.

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

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.

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

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

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

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

$$= (x-2)(x-2)^2$$

$$= (x-2)^3$$

We cannot further factorize the expression.

So, the required factorization of x(x-2)(x-4)+4x-8 is $(x-2)^3$

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