



Factorizations Ex 7.8 Q16

Answer :

The given expression is $36a^2 + 12abc - 15b^2c^2$.

(Coefficient of $a^2 = 36$, coefficient of $a = 12bc$ and constant term $= -15b^2c^2$)

Now, we will split the coefficient of a into two parts such that their sum is $12bc$ and their product equals the product of the coefficient of a^2 and the constant term, i.e., $36 \times (-15b^2c^2) = -540b^2c^2$.

Now,

$$(-18bc) + 30bc = 12bc$$

and

$$(-18bc) \times 30bc = -540b^2c^2$$

Replacing the middle term $12abc$ by $-18abc + 30abc$, we get :

$$\begin{aligned} 36a^2 + 12abc - 15b^2c^2 &= 36a^2 - 18abc + 30abc - 15b^2c^2 \\ &= (36a^2 - 18abc) + (30abc - 15b^2c^2) \\ &= 18a(2a - bc) + 15bc(2a - bc) \\ &= (18a + 15bc)(2a - bc) \\ &= 3(6a + 5bc)(2a - bc) \end{aligned}$$

Factorizations Ex 7.8 Q17

Answer :

The given expression is $15x^2 - 16xyz - 15y^2z^2$.

(Coefficient of $x^2 = 15$, coefficient of $x = -16yz$ and constant term $= -15y^2z^2$)

Now, we will split the coefficient of x into two parts such that their sum is $-16yz$ and their product equals the product of the coefficient of x^2 and the constant term, i.e.,

$$15 \times (-15y^2z^2) = -225y^2z^2.$$

Now,

$$(-25yz) + 9yz = -16yz$$

and

$$(-25yz) \times 9yz = -225y^2z^2$$

Replacing the middle term $-16xyz$ by $-25xyz + 9xyz$, we have :

$$\begin{aligned} 15x^2 - 16xyz - 15y^2z^2 &= 15x^2 - 25xyz + 9xyz - 15y^2z^2 \\ &= (15x^2 - 25xyz) + (9xyz - 15y^2z^2) \\ &= 5x(3x - 5yz) + 3yz(3x - 5yz) \\ &= (5x + 3yz)(3x - 5yz) \end{aligned}$$

Factorizations Ex 7.8 Q18

Answer :

The given expression is $a^2 - 5a + 6$.

Assuming $a = x - 2y$, we have :

$$(x - 2y)^2 - 5(x - 2y) + 6 = a^2 - 5a + 6 \quad (\text{Coefficient of } a^2 = 1, \text{ coefficient of } a = -5 \text{ and constant term} = 6)$$

Now, we will split the coefficient of a into two parts such that their sum is -5 and their product equals the product of the coefficient of a^2 and the constant term, i.e., $1 \times 6 = 6$.

Clearly,

$$(-2) + (-3) = -5$$

and

$$(-2) \times (-3) = 6$$

Replacing the middle term $-5a$ by $-2a - 3a$, we have :

$$\begin{aligned} a^2 - 5a + 6 &= a^2 - 2a - 3a + 6 \\ &= (a^2 - 2a) - (3a - 6) \\ &= a(a - 2) - 3(a - 2) \\ &= (a - 3)(a - 2) \end{aligned}$$

Replacing a by $(x - 2y)$, we get :

$$(a - 3)(a - 2) = (x - 2y - 3)(x - 2y - 2)$$

Factorizations Ex 7.8 Q19

Answer :

Assuming $x = 2a - b$, we have :

$$(2a - b)^2 + 2(2a - b) - 8 = x^2 + 2x - 8$$

The given expression becomes $x^2 + 2x - 8$. (Coefficient of $x^2 = 1$ and that of $x = 2$; constant term $= -8$)

Now, we will split the coefficient of x into two parts such that their sum is 2 and their product equals the product of the coefficient of x^2 and the constant term, i.e., $1 \times (-8) = -8$.

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

and

$$(-2) \times 4 = -8$$

Replacing the middle term $2x$ by $-2x + 4x$, we get :

$$\begin{aligned} x^2 + 2x - 8 &= x^2 - 2x + 4x - 8 \\ &= (x^2 - 2x) + (4x - 8) \\ &= x(x - 2) + 4(x - 2) \\ &= (x + 4)(x - 2) \end{aligned}$$

Relacing x by $2a - b$, we get :

$$(x + 4)(x - 2) = (2a - b + 4)(2a - b - 2)$$

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