## Factorizations Ex 7.8 Q16

**Answer :**

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

$\left(\text{Coefficient of } a^2 = 36,\ \text{coefficient of } a = 12bc \text{ and constant term} = -15b^2c^2\right)$

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., $36 \times \left(-15b^2c^2\right) = -540b^2c^2$.

Now,

$\left(-18bc\right) + 30bc = 12bc$

and

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

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

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

## Factorizations Ex 7.8 Q17

**Answer :**

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

$\left(\textit{Coefficient of } x^2 = 15,\ \textit{coefficient of } x = -16yz \textit{ and constant term} = -15y^2z^2\right)$

*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.,* $15 \times \left(-15y^2z^2\right) = -225y^2z^2$.

*Now,*

$\left(-25yz\right) + 9yz = -16yx$

*and*

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

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

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

## Factorizations Ex 7.8 Q18

**Answer :**

The given expression is $a^2 - 5a + 6$.
Assuming $a = x - 2y$, we have :
$(x - 2y)^2 - 5(x - 2y) + 6 = a^2 - 5a + 6$ (Coefficient of $a^2 = 1$, coefficient of $a = -5$ 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.,* $1 \times (-8) = -8$.
*Clearly,*
$(-2) + 4 = 2$
*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 :*
$(x + 4)(x - 2) = (2a - b + 4)(2a - b - 2)$

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