Factorizations Ex 7.8 Q11

Answer :

The given expression is $12x^2 - 17xy + 6y^2$.
$(\text{Coefficient of } x^2 = 12,\ \text{coefficient of } x = -17y \text{ and constant term} = 6y^2)$
We willsplit the coefficient of x into two parts such that their sum is $-17y$ and their product equals the product of the coefficient of x^2 and the constant term i.e., $12 \times 6y^2 = 72y^2$.
Now,
$(-9y) + (-8y) = -17y$
and
$(-9y) \times (-8y) = 72y^2$
Replacing the middle term $-17xy$ by $-9xy - 8xy$, we get :

$$\begin{aligned} 12x^2 - 17xy + 6y^2 &= 12x^2 - 9xy - 8xy + 6y^2 \\ &= (12x^2 - 9xy) - (8xy - 6y^2) \\ &= 3x(4x - 3y) - 2y(4x - 3y) \\ &= (3x - 2y)(4x - 3y) \end{aligned}$$

Factorizations Ex 7.8 Q12

Answer :

The given expression is $6x^2 - 5xy - 6y^2$.
$(\text{Coefficient of } x^2 = 6,\ \text{coefficient of } x = -5y \text{ and constant term} = -6y^2)$
We will split the coefficient of x into two parts such that their sum is $-5y$ and their product equals the product of the coefficient of x^2 and the constant term, i.e., $6 \times (-6y^2) = -36y^2$.
Now,
$(-9y) + 4y = -5y$
and
$(-9y) \times 4y = -36y^2$
Replacing the middle term $-5xy$ by $-9xy + 4xy$, we get :

$$\begin{aligned} 6x^2 - 5xy - 6y^2 &= 6x^2 - 9xy + 4xy - 6y^2 \\ &= (6x^2 - 9xy) + (4xy - 6y^2) \\ &= 3x(2x - 3y) + 2y(2x - 3y) \\ &= (3x + 2y)(2x - 3y) \end{aligned}$$

Factorizations Ex 7.8 Q13

Answer :

The given expression is $6x^2 - 13xy + 2y^2$.
$(\text{Coefficient of } x^2 = 6,\ \text{coefficient of } x = -13y \text{ and constant term} = 2y^2)$
We will split the coefficient of x into two parts such that their sum is $-13y$ and their product equals the product of the coefficient of x^2 and the constant term, i.e., $6 \times (2y^2) = 12y^2$.
Now,
$(-12y) + (-y) = -13y$
and
$(-12y) \times (-y) = 12y^2$
Replacing the middle term $-13xy$ by $-12xy - xy$, we get :

$$\begin{aligned} 6x^2 - 13xy + 2y^2 &= 6x^2 - 12xy - xy + 2y^2 \\ &= (6x^2 - 12xy) - (xy - 2y^2) \\ &= 6x(x - 2y) - y(x - 2y) \\ &= (6x - y)(x - 2y) \end{aligned}$$

Factorizations Ex 7.8 Q14

Answer :

The given expression is $14x^2 + 11xy - 15y^2$. (Coefficient of $x^2 = 14$, coefficient of $x = 11y$ and constant term $= -15y^2$)

Now, we will split the coefficient of x into two parts such that their sum is $11y$ and their product equals the product of the coefficient of x^2 and the constant term, i.e., $14 \times (-15y^2) = -210y^2$.

Now,

$21y + (-10y) = 11y$

and

$21y \times (-10y) = -210y^2$

Replacing the middle term $-11xy$ by $-10xy + 21xy$, we get :

$$\begin{aligned} 14x^2 + 11xy - 15y^2 &= 14x^2 - 10xy + 21xy - 15y^2 \\ &= (14x^2 - 10xy) + (21xy - 15y^2) \\ &= 2x(7x - 5y) + 3y(7x - 5y) \\ &= (2x + 3y)(7x - 5y) \end{aligned}$$

Factorizations Ex 7.8 Q15

Answer :

The given expression is $6a^2 + 17ab - 3b^2$. $\left(\text{Coefficient of } a^2 = 6, \text{ coefficient of } a = 17b \text{ and constant term} = -3b^2\right)$

Now, we will split the coefficient of a into two parts such that their sum is $17b$ and their product equals the product of the coefficient of a^2 and the constant term, i.e., $6 \times \left(-3b^2\right) = -18b^2$.

Now,

$18b + \left(-b\right) = 17b$

and

$18b \times \left(-b\right) = -18b^2$

Replacing the middle term $17ab$ by $-ab + 18ab$, we get :

$$\begin{aligned} 16a^2 + 17ab - 3b^2 = 6a^2 + -ab + 18ab - 3b^2 \\ &= \left(6a^2 - ab\right) + \left(18ab - 3b^2\right) \\ &= a\left(6a - b\right) + 3b\left(6a - b\right) \\ &= \left(a + 3b\right)\left(6a - b\right) \end{aligned}$$

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