Factorizations Ex 7.8 Q1

Answer :

The given expression is $2x^2+5x+3$.

$(\text{Coefficient of } x^2=2,\ \text{coefficient of } x=5 \text{ and constant term}=3)$

We will split the coefficient of x into two parts such that their sum is 5 and their product equals the product of the coefficient of x^2 and the constant term, i.e., $2\times 3=6$.

Now,

$2+3=5$

and

$2\times 3=6$

Replacing the middle term $5x$ by $2x+3x$, we have :

$$\begin{aligned}2x^2+5x+3&=2x^2+2x+3x+3\\&=(2x^2+2x)+(3x+3)\\&=2x(x+1)+3(x+1)\\&=(x+1)(2x+3)\end{aligned}$$

Factorizations Ex 7.8 Q2

Answer :

The given expression is $2x^2-3x-2$.

$(\text{Coefficient of } x^2=2,\ \text{coefficient of } x=-3 \text{ and constant term}=-2)$

We will split the coefficient of x into two parts such that their sum is -3 and their product equals the product of the coefficient of x^2 and the constant term, i.e., $2\times(-2)=-4$.

Now,

$(-4)+1=-3$

and

$(-4)\times 1=-4$

Replacing the middle term $3x$ by $-4x+x$, we have :

$$\begin{aligned}2x^2-3x-2&=2x^2-4x+x-2\\&=(2x^2-4x)+(x-2)\\&=2x(x-2)+(x-2)\\&=(2x+1)(x-2)\end{aligned}$$

Factorizations Ex 7.8 Q3

Answer :

The given expression is $3x^2+10x+3$. $(\text{Coefficient of } x^2=3,\ \text{coefficient of } x=10 \text{ and constant term}=3)$

We will split the coefficient of x into two parts such that their sum is 10 and their product equals the product of the coefficient of x^2 and the constant term, i.e., $3\times 3=9$.

Now,

$9+1=10$

and

$9\times 1=9$

Replacing the middle term $10x$ by $9x+x$, we have :

$$\begin{aligned}3x^2+10x+3&=3x^2+9x+x+3\\&=(3x^2+9x)+(x+3)\\&=3x(x+3)+(x+3)\\&=(3x+1)(x+3)\end{aligned}$$

Factorizations Ex 7.8 Q4

Answer :

The given expression is $7x-6-2x^2$.

$\left(\text{Coefficient of } x^2=-2,\ \text{coefficient of } x=7 \text{ and constant term}=-6\right)$

We will split the coefficient of x into two parts such that their sum is 7 and their product equals the product of the coefficient of x^2 and the constant term, i.e., $(-2)\times(-6)=12$.

Now,

$4+3=7$

and

$4\times 3=12$

Replacing the middle term $7x$ by $4x+3x$, we have :

$$\begin{aligned}7x-6-2x^2 &= -2x^2+4x+3x-6\\ &= (-2x^2+4x)+(3x-6)\\ &= 2x(2-x)-3(2-x)\\ &= (2x-3)(2-x)\end{aligned}$$

Factorizations Ex 7.8 Q5

Answer :

The given expression is $7x^2-19x-6$. $\left(\text{Coefficient of } x^2=7,\ \text{coefficient of } x=-19 \text{ and constant term}=-6\right)$

We will split the coefficient of x into two parts such that their sum is -19 and their product equals the product of the coefficient of x^2 and the constant term, i.e., $7\times(-6)=-42$.

Now,

$(-21)+2=-19$

and

$(-21)\times 2=-42$

Replacing the middle term $-19x$ by $-21x+2x$, we have :

$$\begin{aligned}7x^2-19x-6 &= 7x^2-21x+2x-6\\ &= (7x^2-21x)+(2x-6)\\ &= 7x(x-3)+2(x-3)\\ &= (7x+2)(x-3)\end{aligned}$$

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