RD SHARMA

Solutions

Class 8 Maths

Chapter *7*

Ex *7.7*

Q1. $x^2 + 12x - 45$

Soln:

To factories $x^2 + 12x - 45$, we will find two numbers p and q such that $p + q = 12$ and $pq = -45$.

Now,

$15 + (-3) = 12$

And

$15 \times (-3) = -45$

Splitting the middle term 12x in the given quadratic as -3x + 15x, we get:

$x^2 + 12x - 45$

$= x^2 - 3x + 15x - 45$

$= (x^2 - 3x) + (15x - 45)$

$= x(x - 3) + 15(x - 3)$

$= (x - 3)(x + 15)$

Q2. $40 + 3x - x^2$

Soln:

We have:

$40 + 3x - x^2$

$= -(x^2 - 3x - 40)$

To factories $(x^2 - 3x - 40)$, we fill find two number p and q such $p + q = -3$ and $pq = -40$

Now,

$5 + (-8) = -3$

And

$5 \times (-8) = -40$

Splitting the middle term -3x in the given quadratic as 5x - 8x, we get:

$40 + 3x - x^2 = -(x^2 - 3x - 40)$

$= -(x^2 + 5x - 8x - 40)$

$= -[(x^2 + 5x) - (8x + 40)]$

$= - [x(x + 5) - 8(x + 5)]$

$= -(x - 8)(x + 5)$

$= (x + 5)(-x + 8)$

Q3. $a^2 + 3a - 88$

Soln:

To factories $a^2 + 3a - 88$, we will find two numbers p and q such that $p + q = 3$ and $pq = -88$.

Now, $11 + (-8) = 3$

And $11 \times (-8) = -88$

Splitting the middle term 3a in the given quadratic as 11a - 8a, we get:

$a^2 + 3a - 88 = a^2 + 11a - 8a - 88$

$= (a^2 + 11a) - (8a + 88)$

$= a(a + 11) - 8(a + 11)$

$= (a - 8)(a + 11)$

Q4. $a^2 - 14a - 51$

Soln:

To factories $a^2 - 14a - 51$, we will find two numbers p and q such that p + q = -14 and pq = -51

Now,

3 + (-17) = -14

and

3 x (-17) = -51

Splitting the middle term -14a in the given quadratic as 3a – 17a, we get:

$a^2 - 14a - 51 = a^2 + 3a - 17a - 51$

$= (a^2 + 3a) - (17a + 51)$

$= a(a + 3) - 17(a + 3)3$

$= (a - 17) (a + 3)$

Q5. $x^2 + 14x + 45$

Soln:

To factories $x^2 + 14x + 45$, we will find two numbers p and q such that p + q = 14 and pq = 45

Now,

9 + 5 = 14

And

9 x 5 = 45

Splitting the middle term 14x in the given quadratic as 9x + 5x, we get:

$x^2 + 14x + 45 = x^2 + 9x + 5x + 45$

$= (x^2 + 9x) + (5x + 45)$

$= x(x + 9) + 5(x + 9)$

$= (x + 5)(x + 9)$

Q6. $x^2 - 22x + 120$

Soln:

To factories $x^2 - 22x + 120$, we will find two numbers p and q such that p + q = -22 and pq = 120

Now, (-12) + (-10) = -22

And

(-12) x (-10) = 120

Splitting the middle term -22x in the given quadratic as -12x – 10x, we get:

$x^2 - 22x + 12 = x^2 - 12x - 10x + 120$

$= (x^2 - 12x) + (-10x + 120)$

$= x(x - 12) - 10(x - 12)$

$= (x - 10)(x - 12)$

Q7. $x^2 - 11x - 42$

Soln:

To factories $x^2 - 11x - 42$, we will find two numbers p and q such that p + q = -11 and pq = -42

Now,

3 + (-14) = -22

And

3 x (-14) = 42

Splitting the middle term -11x in the given quadratic as -14x + 3x, we get:

$x^2 - 11x - 42 = x^2 - 14x + 3x - 42$

$= (x^2 - 14x) + (3x - 42)$

$= x(x - 14) + 3(x - 14)$

$= (x - 14)(x + 3)$

Q8. $a^2 - 2a - 3$

Soln:

To factories $a^2 - 2a - 3$, we will find two numbers p and q such that $p + q = 2$ and $pq = -3$

Now,

$3 + (-1) = 2$

And

$3 \times (-1) = -3$

Splitting the middle terms 2a in the given quadratic as $-a + 3a$, we get:

$a^2 + 2a - 3 = a^2 - a + 3a - 3$

$= (a^2 - a) + (3a - 3)$

$= a(a - 1) + 3(a - 1)$

Q9. $a^2 + 14a + 48$

Soln:

To factories $a^2 + 14a + 48$, we will find two numbers p and q such that $p + q = 14$ and $pq = 48$

Now,

$8 + 6 = 14$

And

$8 \times 6 = 48$

Splitting the middle terms 14a in the given quadratic as 8a + 6a, we get:

$a^2 + 14a + 48 = a^2 + 8a + 6a + 48$

$= (a^2 + 8a) + (6a + 48)$

$= a(a + 8) + 6(a + 8)$

$= (a + 6)(a + 8)$

Q10. $x^2 - 4x - 21$

Soln:

To factories $x^2 - 4x - 21$, we will find two numbers p and q such that $p + q = -4$ and $pq = -21$

Now,

$3 + (-7) = -4$

And

$3 \times (-7) = -21$

Splitting the middle terms -4x in the given quadratic as -7x + 3x, we get:

$x^2 - 4x - 21 = x^2 - 7x + 3x - 21$

$= (x^2 - 7x) + (3x - 21)$

$= x(x - 7) + 3(x - 7)$

$= (x - 7)(x + 3)$

Q11. $y^2 + 5y - 36$

Soln:

To factories $y^2 + 5y - 36$, we will find two numbers p and q such that $p + q = 5$ and $pq = -36$

Now,

$9 + (-4) = 5$

And

$9 \times (-4) = -36$

Splitting the middle terms 5y in the given quadratic as -7y + 9y, we get:

$y^2 + 5y - 36 = y^2 - 4y + 9y - 36$

$= (y^2 - 4y) + (9y - 36)$

$= y(y - 4) + 9(y - 4)$

$= (y - 4)(y - 4)$

Q12. $(a^2 — 54)^2 — 36$

Soln:

$(a^2 — 54)^2 — 36$

$= (a^2 — 5a)^2 — 6^2$

$= [(a^2 — 5a) — 6] [(a^2 - 5a) + 6]$

$= (a^2 — 5a — 6) (a^2 — 5a + 6)$

In order to factories $a^2 — 5a — 6$, we will find two numbers p and q such that $p+ q = —5$ and $pq = —6$

Now,

$(-6) + 1 = —5$

and

$(-6) \times 1 = —6$

Splitting the middle term -5 in the given quadratic as $-6a + a$, we get :

$a^2 — 5a — 6 = a^2 — 6a + a — 6$

$= (a^2 — 6a) + (a — 6)$

$= a(a — 6) + (a — 6)$

$= (a + 1) (a — 6)$

Now, In order to factories $a^2 — 5a + 6$, we will find two numbers p and q such that $p + q = —5$ and $pq = 6$

Clearly,

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

and

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

Splitting the middle term -5 in the given quadratic as $-2a - 3a$, we get :

$a^2 - 5a + 6 = a^2 - 2a - 3a + 6$

$= (a^2 - 2a) - (3a - 6)$

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

$\therefore$ $(a^2 - 5a - 6) (a^2 - 5a + 6)$

$= (a - 6) (a + 1) (a - 3) (a - 2)$

$= (a + 1) (a - 2) (a - 3) (a - 6)$

Q13. $(a + 7)(a - 10) + 16$

Soln:

$(a + 7)(a - 10) + 16$

$= a^2 - 10a + 7a - 70 + 16$

$= a^2 - 3a - 54$

To factories $a^2 - 3a - 54$, we will find two numbers p and q such that $p + q = -3$ and $pq = -54$

Now,

$6 + (-9) = -3$

And $6 \times (-9) = -54$

Splitting the middle term -3a in the given quadratic as $-9a + 6a$, we get:

$a^2 - 3a - 54 = a^2 - 9a + 6a - 54$

$= (a^2 - 9a) + (6a - 54)$

$= a(a - 9) + 6(a - 9)$

$= (a + 6)(a - 9)$