

**RD SHARMA**  
**Solutions**  
**Class 8 Maths**  
**Chapter 7**  
**Ex 7.6**

**Solve:**

**Q1.  $4x^2 + 12xy + 9y^2$**

**Soln.**

$$= (2x)^2 + 2 \times 2x \times 3y + (3y)^2$$

$$= (2x + 3y)^2$$

$$= (2x + 3y)(2x + 3y)$$

**Q2.  $9a^2 - 24ab + 16b^2$**

**Soln.**

$$9a^2 - 24ab + 16b^2$$

$$= (3a)^2 - 2 \times 3a \times 4b + (4b)^2$$

$$= (3a - 4b)^2$$

$$= (3a - 4b)(3a - 4b)$$

**Q3.  $p^2q^2 - 6qr + 9r^2 = (pq)^2 - 2 \times pq \times 3r + (3r)^2$**

**Soln.**

$$p^2q^2 - 6qr + 9r^2 = (pq)^2 - 2 \times pq \times 3r + (3r)^2$$

$$= (pq - 3r)^2$$

$$= (pq - 3r)(pq - 3r)$$

**Q4.  $36a^2 + 36a + 9$**

**Soln.**

$$36a^2 + 36a + 9$$

$$= 9(4a^2 + 4a + 1) = 9\{(2a)^2 + 2 \times 2a \times 1 + 1^2\}$$

$$= 9(2a + 1)^2$$

$$= 9(2a + 1)(2a + 1)$$

**Q5.  $a^2 + 2ab + b^2 - 16$**

**Soln.**

$$a^2 + 2ab + b^2 - 16$$

$$= a^2 + 2 \times a \times b + b^2 - 16$$

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

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

**Q6.  $9z^2 - x^2 + 4xy - 4y^2$**

**Soln.**

$$9z^2 - x^2 + 4xy - 4y^2$$

$$= 9z^2 - (x^2 - 4xy + 4y^2)$$

$$= 9z^2 - [x^2 - 2 \times x \times 2y + (2y)^2]$$

$$= (3z)^2 - (x - 2y)^2$$

$$= [3z - (x - 2y)][3z + (x - 2y)]$$

$$= (3z - x + 2y)(3z + x - 2y)$$

$$= (x - 2y + 3z)(-x + 2y + 3z)$$

**Q7.  $9a^4 - 24a^2b^2 + 16b^4 - 256$**

**Soln.**

$$\begin{aligned} & 9a^4 - 24a^2b^2 + 16b^4 - 256 \\ &= (9a^4 - 24a^2b^2 + 16b^4) - 256 \\ &= [(3a^2)^2 - 2 \times 3a^2 \times 4b^2 + (4b^2)^2] - 16^2 \\ &= (3a^2 - 4b^2)^2 - 16^2 \\ &= [(3a^2 - 4b^2) - 16][(3a^2 - 4b^2) + 16] \\ &= (3a^2 - 4b^2 - 16)(3a^2 - 4b^2 + 16) \end{aligned}$$

**Q8.  $16 - a^6 + 4a^3b^3 - 4b^6$**

**Soln.**

$$\begin{aligned} & 16 - a^6 + 4a^3b^3 - 4b^6 \\ &= 16 - (a^6 - 4a^3b^3 + 4b^6) \\ &= 4^2 - [(a^3)^2 - 2 \times a^3 \times 2b^3 + (2b^3)^2] \\ &= 4^2 - (a^3 - 2b^3)^2 \\ &= [4 - (a^3 - 2b^3)][4 + (a^3 - 2b^3)] \\ &= (4 - a^3 + 2b^3)(4 + a^3 - 2b^3) \\ &= (a^3 - 2b^3 + 4)(-a^3 + 2b^3 + 4) \end{aligned}$$

**Q9.  $a^2 - 2ab + b^2 - c^2$**

**Soln.**

$$\begin{aligned} & a^2 - 2ab + b^2 - c^2 \\ &= (a^2 - 2ab + b^2) - c^2 \\ &= (a^2 - 2 \times a \times b + b^2) - c^2 \\ &= (a - b)^2 - c^2 \\ &= [(a - b) - c][(a - b) + c] \\ &= (a - b - c)(a - b + c) \end{aligned}$$

**Q10.  $X^2 + 2X + 1 - 9Y^2$**

**Soln.**

$$\begin{aligned} & X^2 + 2X + 1 - 9Y^2 \\ &= (X^2 + 2X + 1) - 9Y^2 \\ &= (X^2 + 2 \times X \times 1 + 1) - 9Y^2 \\ &= (X + 1)^2 - (3Y)^2 \\ &= [(X + 1) - 3Y][(X + 1) + 3Y] \\ &= (X + 1 - 3Y)(X + 1 + 3Y) \\ &= (X + 3Y + 1)(X - 3Y + 1) \end{aligned}$$

**Q11.  $a^2 + 4ab + 3b^2$**

**Soln.**

$$a^2 + 4ab + 3b^2$$

$$\begin{aligned}
&= a^2 + 4ab + 4b^2 - b^2 \\
&= [a^2 + 2 \times a \times 2b + (2b)^2] - b^2 \\
&= (a + 2b)^2 - b^2 \\
&= [(a + 2b) - b][(a + 2b) + b] \\
&= (a + 2b - b)(a + 2b + b) \\
&= (a + b)(a + 3b)
\end{aligned}$$

**Q12.  $96 - 4x - x^2$**

**Soln:**

$$\begin{aligned}
&96 - 4x - x^2 \\
&= 100 - 4 - 4x - x^2 \\
&= 100 - (x^2 + 4x + 4) \\
&= 100 - (x^2 + 2 \times x \times 2 + 2^2) \\
&= 10^2 - (x + 2)^2 \\
&= [10 - (x + 2)][10 + (x + 2)] \\
&= (10 - x - 2)(10 + x + 2) \\
&= (8 - x)(12 + x) \\
&= (x + 12)(-x + 8)
\end{aligned}$$

**Q13.  $a^4 + 3a^2 + 4$**

**Soln.**

$$\begin{aligned}
&a^4 + 3a^2 + 4 \\
&= a^4 + 4a^2 - a^2 + 4 \\
&= (a^4 + 4a^2 + 4) - a^2 \\
&= [(a^2)^2 + 2 \times a^2 \times 2 + 2^2] - a^2 \\
&= (a^2 + 2)^2 - a^2 \\
&= [(a^2 + 2) - a][(a^2 + 2) + a] \\
&= (a^2 - a + 2)(a^2 + a + 2)
\end{aligned}$$

**Q14.  $4x^4 + 1$**

**Soln.**

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

**Q15.  $4x^4 + y^4$**

**Soln.**

$$\begin{aligned}
&4x^4 + y^4 \\
&= 4x^4 + 4x^2 + y^4 - 4x^2y^2 \\
&= [(2x^2)^2 + 2 \times 2x^2 \times y + (y^2)^2] - (2xy)^2 \\
&= (2x^2 + y^2)^2 - (2xy)^2
\end{aligned}$$

$$= [(2x^2 + y^2) - 2xy] [(2x^2 + y^2) + 2xy]$$

$$= (2x^2 - 2xy + y^2)(2x^2 + 2xy + y^2)$$

**Q16.  $(x + 2)^2 - 6(x + 2) + 9$**

**Soln.**

$$(x + 2)^2 - 6(x + 2) + 9$$

$$= (x + 2)^2 - 2 \times (x + 2) \times 3 + 3^2$$

$$= [(x + 2) - 3]^2$$

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

$$= (x - 1)^2$$

$$= (x - 1)(x - 1)$$

**Q17.  $25 - p^2 - q^2 - 2pq$**

**Soln.**

$$25 - p^2 - q^2 - 2pq$$

$$= 25 - (p^2 + 2pq + q^2)$$

$$= 5^2 - (p^2 + 2 \times p \times q + q^2)$$

$$= 5^2 - (p + q)^2$$

$$= [5 - (p + q)] [5 + (p + q)]$$

$$= (5 - p + q) (5 + p + q)$$

$$= -(p + q - 5)(p + q + 5)$$

**Q18.  $x^2 + 9y^2 - 6xy - 25a^2$**

**Soln.**

$$x^2 + 9y^2 - 6xy - 25a^2$$

$$= (x^2 - 6xy + 9y^2) - 25a^2$$

$$= [x^2 - 2 \times x \times 3y + (3y)^2] - 25a^2$$

$$= (x - 3y)^2 - (5a)^2$$

$$= [(x - 3y) - 5a][(x - 3y) + 5a]$$

$$= (x - 3y - 5a)(x - 3y + 5a)$$

**Q19.  $49 - a^2 + 8ab - 16b^2$**

**Soln.**

$$49 - a^2 + 8ab - 16b^2$$

$$= 49 - (a^2 - 8ab + 16b^2)$$

$$= 49 - [a^2 - 2 \times a \times 4b + (4b)^2]$$

$$= 7^2 - (a - 4b)^2$$

$$= [7 - (a - 4b)][7 + (a - 4b)]$$

$$= (7 - a + 4b)(7 + a - 4b)$$

$$= -(a - 4b - 7)(a - 4b + 7)$$

$$= -(a - 4b + 7)(a - 4b - 7)$$

**Q20.  $a^2 - 8ab + 16b^2 - 25c^2$**

**Soln.**

$$\begin{aligned} & a^2 - 8ab + 16b^2 - 25c^2 \\ &= (a^2 - 8ab + 16b^2) - 25c^2 \\ &= [a^2 - 2 \times a \times 4b + (4b)^2] - 25c^2 \\ &= (a - 4b)^2 - (5c)^2 \\ &= [(a - 4b) - 5c] [(a - 4b) + 5c] \\ &= (a - 4b - 5c)(a - 4b + 5c) \end{aligned}$$

**Q21.  $x^2 - y^2 + 6y - 9$**

**Soln.**

$$\begin{aligned} & x^2 - y^2 + 6y - 9 \\ &= x^2 - (y^2 + 6y - 9) \\ &= x^2 - (y^2 - 2 \times y \times 3 + 3^2) \\ &= x^2 - (y - 3)^2 \\ &= [x - (y - 3)] [x + (y - 3)] \\ &= (x - y + 3)(x + y - 3) \end{aligned}$$

**Q22.  $25x^2 - 10x + 1 - 36y^2$**

**Soln.**

$$\begin{aligned} & 25x^2 - 10x + 1 - 36y^2 \\ &= (25x^2 - 10x + 1) - 36y^2 \\ &= [(5x)^2 - 2 \times 5x \times 1 + 1] - 36y^2 \\ &= (5x - 1)^2 - (6y)^2 \\ &= [(5x - 1) - 6y] [(5x - 1) + 6y] \\ &= (5x - 1 - 6y)(5x - 1 + 6y) \\ &= (5x - 6y - 1)(5x + 6y - 1) \end{aligned}$$

**Q23.  $a^2 - b^2 + 2bc - c^2$**

**Soln.**

$$\begin{aligned} & a^2 - b^2 + 2bc - c^2 \\ &= a^2 - (b^2 - 2bc + c^2) \\ &= a^2 - (b^2 - 2 \times b \times c + c^2) \\ &= a^2 - (b - c)^2 \\ &= [a - (b - c)] [a + (b - c)] \\ &= (a - b + c)(a + b - c) \end{aligned}$$

**Q24.  $a^2 + 2ab + b^2 - c^2$**

**Soln.**

$$\begin{aligned} & a^2 + 2ab + b^2 - c^2 \\ &= (a^2 + 2ab + b^2) - c^2 \\ &= (a^2 + 2 \times a \times b + b^2) - c^2 \\ &= (a + b)^2 - c^2 \\ &= [(a + b) - c] [(a + b) + c] \\ &= (a + b - c)(a + b + c) \end{aligned}$$

**Q25.**  $49 - x^2 - y^2 + 2xy$

**Soln.**

$$\begin{aligned} & 49 - x^2 - y^2 + 2xy \\ &= 49 - (x^2 + 2xy - y^2) \\ &= 7^2 - (x - y)^2 \\ &= [7 - (x - y)] [7 + (x - y)] \\ &= (7 - x + y)(7 + x - y) \\ &= (x - y + 7)(y - x + 7) \end{aligned}$$

**Q26.**  $a^2 + 4b^2 - 4ab - 4c^2$

**Soln.**

$$\begin{aligned} & a^2 + 4b^2 - 4ab - 4c^2 \\ &= (a^2 + 4b^2 - 4ab) - 4c^2 \\ &= [a^2 - 2 \times a \times 2b + (2b)^2] - 4c^2 \\ &= (a - 2b)^2 - (2c)^2 \\ &= [(a - 2b) - 2c] [(a - 2b) + 2c] \\ &= (a - 2b - 2c)(a - 2b + 2c) \end{aligned}$$

**Q27.**  $x^2 - y^2 - 4xz + 4z^2$

**Soln.**

$$\begin{aligned} & x^2 - y^2 - 4xz + 4z^2 \\ &= (x^2 - 4xz + 4z^2) - y^2 \\ &= (x - 2z)^2 - y^2 \\ &= [(x - 2z) - y] [(x - 2z) + y] \\ &= (x - 2z - y)(x - 2z + y) \\ &= (x + y - 2z)(x - y - 2z) \end{aligned}$$