

NCERT SOLUTIONS OF Algebraic Exercise 4

Question 1

Multiply the binomials.

i) $(2x + 5)$ and $(4x - 3)$

(ii) $(y - 8)$ and $(3y - 4)$

(iii) $(2.5l - 0.5m)$ and $(2.5l + 0.5m)$

(iv) $(a + 3b)$ and $(x + 5)$

(v) $(2pq + 3q^2)$ and $(3pq - 2q^2)$

Answer:

Let $(a+b)(c+d)$ to be done

then

$$(a+b)(c+d) = a(c+d) + b(c+d)$$

$$= (a \times c) + (a \times d) + (b \times c) + (b \times d)$$

We will use the same concept in all the question below

i) $(2x + 5)(4x - 3)$

$$= 2x \times 4x - 2x \times 3 + 5 \times 4x - 5 \times 3$$

$$= 8x^2 - 6x + 20x - 15$$

$$= 8x^2 + 14x - 15$$

$$\text{ii) } (y - 8)(3y - 4)$$

$$= y \times 3y - 4y - 8 \times 3y + 32$$

$$= 3y^2 - 4y - 24y + 32$$

$$= 3y^2 - 28y + 32$$

$$\text{iii) } (2.5l - 0.5m)(2.5l + 0.5)$$

$$\text{Using } (a+b)(a-b) = a^2 - b^2$$

$$\text{We get } = 6.25l^2 - 0.25m^2$$

$$\text{iv) } ax + 5a + 3bx + 15b$$

$$\text{v) } 2pq \times 3pq - 2pq \times 2q^2 + 3q^2 \times 3pq - 3q^2 \times 2q^2$$

$$= 6p^2q^2 - 4pq^3 + 9pq^3 - 6q^4$$

$$= 6p^2q^2 - 5pq^3 - 6q^4$$

Question 2

Find the product.

$$\text{(i) } (5 - 2x)(3 + x)$$

$$\text{(ii) } (x + 7y)(7x - y)$$

$$\text{iii) } (a^2 + b)(a + b^2)$$

$$\text{(iv) } (p^2 - q^2)(2p + q)$$

Answer:

$$\text{i) } 15 + 5x - 6x - 2x^2$$

$$= 15 - x - 2x^2$$

$$\text{ii) } 7x^2 - xy + 49xy - 7y^2$$

$$= 7x^2 - 7y^2 + 48xy$$

$$\text{iii) } a^2 \times a + a^2 \times b + a \times b + b^3$$

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

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

$$\text{iv) } 2p^3 + p^2q - 2pq^2 - q^3$$

$$= 2p^3 - q^3 + p^2q - 2pq^2$$

Question 3

Simplify.

$$\text{(i) } (x^2 - 5)(x + 5) + 25$$

$$\text{(ii) } (a^2 + 5)(b^3 + 3) + 5$$

$$\text{(iii) } (a + b)(c - d) + (a - b)(c + d) + 2(ac + bd)$$

$$\text{(iv) } (x + y)(2x + y) + (x + 2y)(x - y)$$

$$\text{(v) } (x + y)(x^2 - xy + y^2)$$

$$\text{(vi) } (1.5x - 4y)(1.5x + 4y + 3) - 4.5x + 12y$$

$$\text{(vii) } (a + b + c)(a + b - c)$$

Answer:

$$\text{i) } x^3 + 5x^2 - 5x - 25 + 25$$

$$= x^3 + 5x^2 - 5x$$

$$\text{ii) } a^2b^3 + 3a^2 + 5b^3 + 15 + 5$$

$$= a^2b^3 + 5b^3 + 3a^2 + 20$$

$$\text{iii) } (ac - ad + bc - bd) + (ac + ad - bc - bd) + (2ac + 2bd)$$

$$= ac - ad + bc - bd + ac + ad - bc - bd + 2ac + 2bd$$

$$= 4ac$$

$$\text{iv) } 2x^2 + xy + 2xy + y^2 + x^2 - xy + 2xy - 2y^2$$

$$= 3x^2 + 4xy - y^2$$

$$\text{v) } x^3 - x^2y + xy^2 + x^2y - xy^2 + y^3$$

$$= x^3 + y^3$$

$$\text{vi) } 2.25x^2 + 6xy + 4.5x - 6xy - 16y^2 - 12y - 4.5x + 12y$$

$$= 2.25x^2 - 16y^2$$

$$\text{vii) } a^2 + ab - ac + ab + b^2 - bc + ac + bc - c^2$$

$$= a^2 + b^2 - c^2 + 2ab$$