

Expansion and Factorisation of Algebraic Expressions

Expansion of Algebraic Expressions

- (i) $a(b \pm c) = ab \pm ac$
- (ii) $(a + b)(c + d) = ac + ad + bc + bd$
- (iii) $(a + b)(c + d + e) = ac + ad + ae + bc + bd + be$
- (iv) $(a + b)^2 = a^2 + 2ab + b^2$
- (v) $(-a - b)^2 = [-(a + b)]^2 = a^2 + 2ab + b^2$
- (vi) $(a - b)^2 = a^2 - 2ab + b^2$
- (vii) $(a + b)(a - b) = a^2 - b^2$



Tips $(a + b)^2$ and $(a - b)^2$ are called **perfect squares**.

$(a + b)(a - b)$ is called the **difference between two squares**.

Factorisation of Algebraic Expressions

- (i) Taking out all the common factors
 $6x - 8xy = 2x(3 - 4y)$
- (ii) Grouping terms to obtain common factors
 $2ax + 5ay - 6x - 15y = a(2x + 5y) - 3(2x + 5y)$
 $= (2x + 5y)(a - 3)$

Factorisation of Quadratic Expressions

Using multiplication frame to factorise quadratic expressions

X		
	2x	-1
x	2x ²	-x
3	6x	-3

$$2x^2 + 5x - 3 = (x + 3)(2x - 1)$$

Solving Quadratic Equations by Factorisation

(i) $a(a - 6) = 0$, then $a = 0$ or $a = 6$.

(ii) $(b - 7)(b + 8) = 0$, then $b = 7$ or $b = -8$.

(iii) $(3 - 2c)(4 + c) = 0$, then $c = \frac{3}{2}$ or $c = -4$.



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