

Algebraic Identities

Chapter 12: Algebraic Identities · Topic 1

Key Concept

The identity $(a+b)^2 = a^2 + 2ab + b^2$ helps us quickly expand squared binomials without multiplying term by term.

The identity $(a-b)^2 = a^2 - 2ab + b^2$ works similarly for subtraction, and $(a+b)(a-b) = a^2 - b^2$ is another useful identity.

These identities can simplify calculations, like finding 102^2 using $(100+2)^2 = 100^2 + 2(100)(2) + 2^2 = 10000 + 400 + 4 = 10404$.

Memorising and applying these identities saves time and helps solve algebra problems more efficiently.

Quick Revision Notes

- $(a+b)^2 = a^2 + 2ab + b^2$.
- $(a-b)^2 = a^2 - 2ab + b^2$.
- $(a+b)(a-b) = a^2 - b^2$.
- These identities expand expressions quickly.
- 102^2 can use $(100+2)^2 = 10404$.
- Identities simplify complex calculations.
- They save time in algebra.
- Memorising them helps solve problems efficiently.

Practice Questions

- 1 Expand $(a+4)^2$ using the identity.
- 2 Expand $(a-3)^2$ using the identity.
- 3 Calculate $(x+2)(x-2)$ using the identity.
- 4 Use an identity to calculate 99^2 easily.
- 5 Solve two identity-based problems.
- 6 Explain why identities save calculation time.