

Laws of Exponents

Chapter 2: Power Play · Topic 1

Key Concept

These laws only apply directly when the bases are the same — $2^3 \times 3^2$ cannot be simplified using these rules since the bases (2 and 3) differ. Understanding and correctly applying these laws avoids tedious repeated multiplication for large exponents and is foundational for algebra, scientific notation, and later topics like logarithms, where similar exponent relationships appear in more advanced forms.

Quick Revision Notes

- $a^m \times a^n = a^{(m+n)}$ — add exponents when multiplying same-base powers.
- $a^m \div a^n = a^{(m-n)}$ — subtract exponents when dividing same-base powers.
- $(a^m)^n = a^{(m \times n)}$ — multiply exponents when raising a power to another power.
- These laws only apply when the bases are the same.

Practice Questions

- 1 Simplify: $5^4 \div 5^2$.
- 2 Simplify: $(3^2)^3$.
- 3 Explain why the laws of exponents cannot directly simplify $2^3 \times 3^2$.