

Indices (Exponents)

Chapter 7: Indices (Exponents) · Topic 1

Key Concept

The laws of indices include: $a^m \times a^n = a^{(m+n)}$, $a^m \div a^n = a^{(m-n)}$, $(a^m)^n = a^{(mn)}$, and $a^0 = 1$ (for non-zero a).

A negative index, like a^{-n} , equals $1/a^n$, representing a reciprocal rather than a negative value.

A fractional index, like $a^{(1/n)}$, represents the n th root of a , so $a^{(1/2)}$ means the square root of a .

Mastering index laws is essential for simplifying complex expressions and solving equations involving powers.

Quick Revision Notes

- $a^m \times a^n = a^{(m+n)}$.
- $a^m \div a^n = a^{(m-n)}$.
- $(a^m)^n = a^{(mn)}$.
- $a^0 = 1$ for non-zero a .
- Negative index: $a^{-n} = 1/a^n$.
- Fractional index: $a^{(1/n)}$ = n th root of a .
- $a^{(1/2)}$ means square root of a .
- Index laws simplify complex expressions.

Practice Questions

- 1 Simplify $3^4 \times 3^2$.
- 2 Simplify $5^6 \div 5^3$.
- 3 Calculate 4^0 .
- 4 Calculate 2^{-3} .
- 5 Calculate $16^{(1/2)}$.
- 6 Solve three index law problems.