Lesson 9

Exponent Rules

Lesson

An exponent tells you how many times to multiply a base by itself:

    x^3 = x * x * x

Key exponent rules:

    Product Rule: x^a * x^b = x^(a+b)
    Quotient Rule: x^a / x^b = x^(a-b)
    Power Rule: (x^a)^b   = x^(a*b)
    Zero Exponent: x^0 = 1   (when x is not 0)
    Negative Exp: x^(-n) = 1 / x^n

Example: Simplify (2x^3)(5x^4)

Step 1: Multiply the coefficients: 2 * 5 = 10

Step 2: Apply the product rule to x: x^3 * x^4 = x^(3+4) = x^7

Result: 10x^7

Practice Problems

1) Simplify: x^5 * x^3

2) Simplify: y^8 / y^2

3) Simplify: (a^3)^4

4) Simplify: (3x^2)(4x^5)

5) Simplify: (2^3)^2

6) Evaluate: 5^0 + 3^(-2)

7) Simplify: (6m^7) / (2m^3)