The Practise Ground

Class 11-12 Maths

Limits & Continuity

Four standard limits and two key rules

1

$$\frac{\sin x}{x} = 1$$

As x tends to 0
Also tan x / x = 1, with x in radians

2

$$\frac{e^x - 1}{x} = 1$$

As x tends to 0
The derivative of e^x at 0 is 1

3

$$\frac{\ln(1 + x)}{x} = 1$$

As x tends to 0
Natural logarithm

4

$$\left(1 + \frac{1}{n}\right)^n = e$$

As n tends to ∞
e is about 2.718

Two key rules

L'Hôpital's rule: for 0/0 or ∞/∞, differentiate the top and bottom separately, then take the limit.

A function is continuous at a if the left limit, the right limit and f(a) are all equal.

Quick example

Find the limit of sin 3x / x as x tends to 0.

= 3 × (sin 3x / 3x)

= 3 × 1 = 3

Think you've got it? Test yourself.

Scan for a free Class 11 Maths quiz.

thepractiseground.in

Free for every class. Print and display it anywhere.