

# Notes : Calculus and Probability Theory 2021

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## Week 1: Intro to Calculus, and Limits

### Formal Defintion of a Limit

**Definition 1.** *Let  $f : D \mapsto \mathbb{R}$  be a function  
if  $f$  has a limit  $b$  when approaching  $a$  if*

$$\forall \epsilon > 0, \exists \delta > 0 \text{ such that } \forall x \in D \quad (1)$$

$$\text{if } 0 < |x - a| < \delta \text{ implies that } |f(x) - b| < \epsilon \quad (2)$$