



CENTRAL LIMIT THEOREM

Why

The sum of several independent and identically distributed random variables tends toward a normal distribution.¹

Result

Prop. 1. *Let (X, \mathcal{A}, μ) be a probability space. Let $(f_n)_n$ be a sequence of independent and identically distributed real-valued random variables on X with $\mathbf{E}(f_n) = \mu < \infty$ and $\text{var}(f_n) = \sigma^2 < \infty$ for all n . Define $s_n = \sum_{i=1}^n f_i$. For all real numbers t ,*

$$\lim_{n \rightarrow \infty} \mu \left(\left\{ x \in X \mid \frac{s_n(x) - n\mu}{\sigma\sqrt{n}} \leq t \right\} \right) = \Phi(t).$$

¹Future editions may modify this statement and further specify the word “tends”.

