$(X_i)_{i=1}^{\infty}$ н.е.р. сл.вел $E|X_1| < \infty$ и $EX_1 = \mu$ $\quad \sigma = \sqrt{DX_1}$

$$S_n = \sum_{j=1}^{n} X_j \Rightarrow \frac{S_n}{n} \xrightarrow[n\to\infty]{п.с.(\mathbb{P})} \mu$$

$$\frac{S_n}{n} - \mu \approx \frac{\sigma}{\sqrt{n}} \cdot H_n$$

Теорема (ЦГТ)

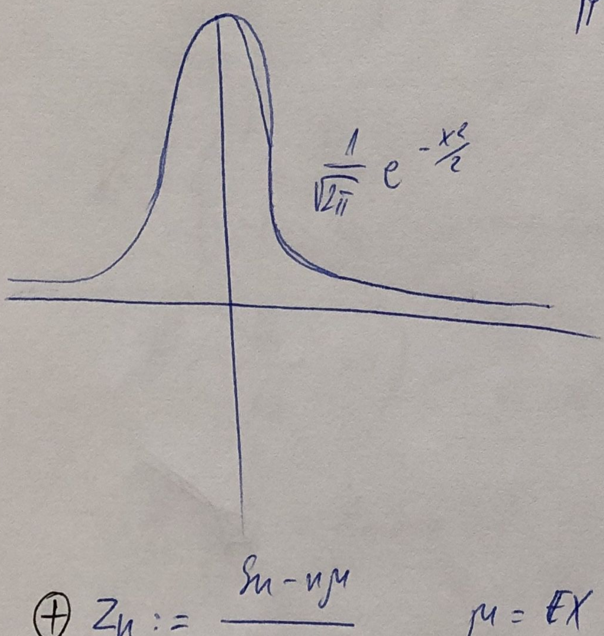
Нека $X = (X_i)_{i=1}^{\infty}$ е редица от н.е.р.сл.вел с $\sigma^2 = DX_1 < \infty$ и $\mu = EX_1$.

Тогава $Z_n \overset{деф}{:=} \dfrac{S_n - n\mu}{\sigma\sqrt{n}} = \dfrac{\frac{S_n}{n} - \mu}{\frac{\sigma}{\sqrt{n}}} \xrightarrow[n\to\infty]{d} Z \in N(0,1)$

$$f_Z(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}$$

$$\mathbb{P}(Z < x) = \Phi(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} e^{-\frac{y^2}{2}} dy$$

$$\mathbb{P}(Z \geq x) = 1 - \Phi(x) = \bar{\Phi}(x)$$



⊕ $Z_n := \dfrac{S_n - n\mu}{\sigma\sqrt{n}}$ $\quad \mu = EX \quad \sigma = \sqrt{DX_1}$ $\quad S_n = \sum_{j=1}^{n} X_j$

$$\mathbb{P}(Z_n \in (a,b)) = \mathbb{P}(S_n \in n\mu + a\sigma\sqrt{n};\ n\mu + b\sigma\sqrt{n}) \sim$$

$$\sim \mathbb{P}(Z \in (a,b)) = \Phi(b) - \Phi(a) = \frac{1}{\sqrt{2\pi}} \int_a^b e^{-y^2/2} dy$$