

$$E[\bar{X}_n] = \mu$$

$$\text{Var}(\bar{X}_n) = \frac{\sigma^2}{n}$$

$$\text{SD}(\bar{X}_n) = \sqrt{\frac{\sigma^2}{n}} = \frac{\sigma}{\sqrt{n}}$$

$$\frac{\bar{X}_n - E[\bar{X}_n]}{\sqrt{\text{Var}(\bar{X}_n)}} = \frac{\bar{X}_n - \mu}{\sigma/\sqrt{n}}$$

$$\frac{\sqrt{n}(\bar{X}_n - \mu)}{\sigma} =: \bar{Y}_n$$

$$\left( \Pr\left( \frac{Y}{\sigma} \leq \underline{x} \right) \right) \quad \text{VARIÁVEL ALEATÓRIA}$$

$$\lim_{n \rightarrow \infty} \Rightarrow \Phi(x)$$

PADRONIZAR  
(STANDARDISE)

$$Y; \quad E[Y] = \mu$$

$$\text{Var}(Y) = \sigma^2$$

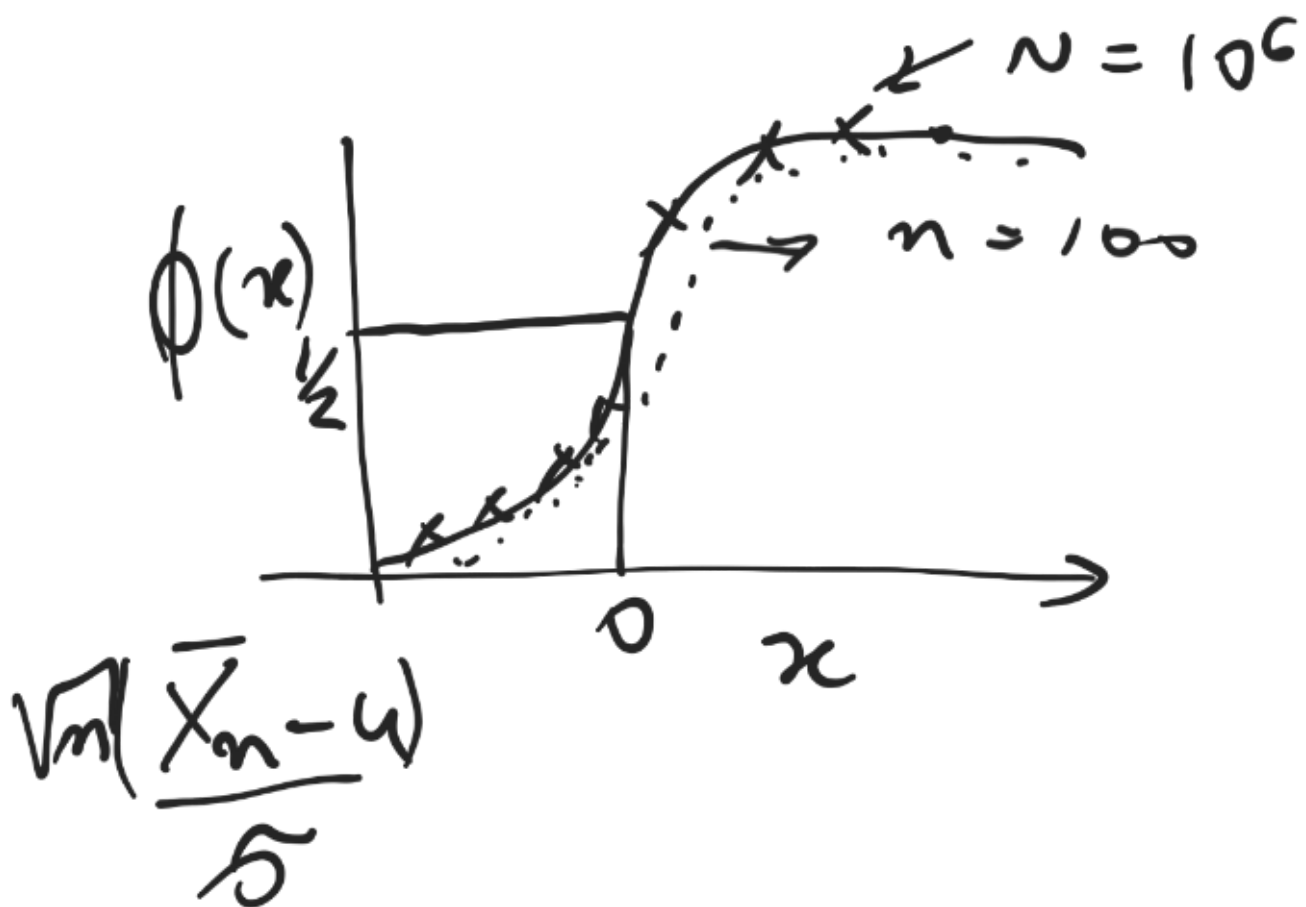
$$\tilde{Y} = \frac{Y - \mu}{\sqrt{\sigma^2}} = \frac{Y - \mu}{\sigma}$$

↗

PADRONIZADA

$$E[\tilde{Y}] = 0$$

$$\text{Var}(\tilde{Y}) = 1$$



# EXEMPLO CLT

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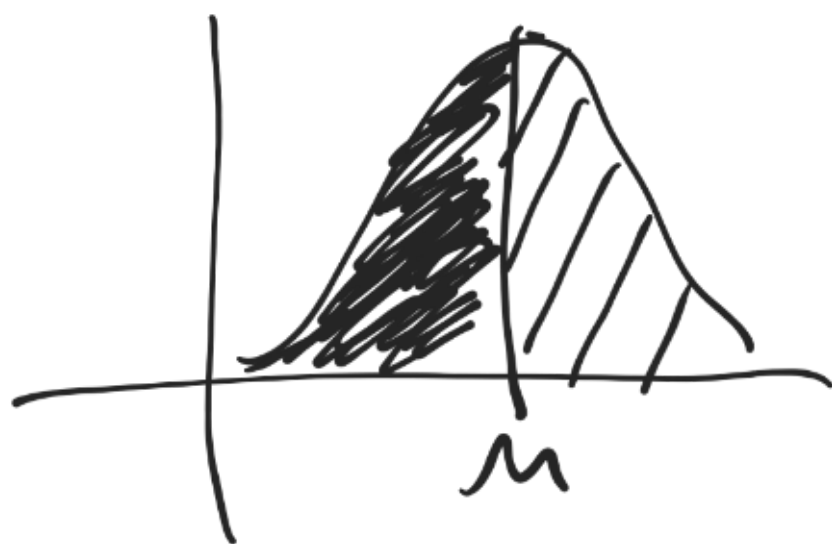
$$Y = \sum_{i=1}^n X_i ; X_i \sim U(0,1)$$

$Y$  TEM DISTRIBUIÇÃO

IRWIN-HALL

COM PARÂMETRO  $n$

$$\blacksquare = \square$$



$$X \sim N(\mu, \sigma^2)$$

$$Pr(X \geq u) = Pr(X < u)$$

$$Y \sim N(0, 1)$$

$$Pr(Y < 0) = Pr(Y \geq 0)$$

$$Pr(|Z| < 1.2) = 2 Pr(Z < 1.2)$$

↗  $Pr(|Z| < 1.2)$

NORMAL É SIMÉTRICA  
EM TORNO DA MÉDIA.

