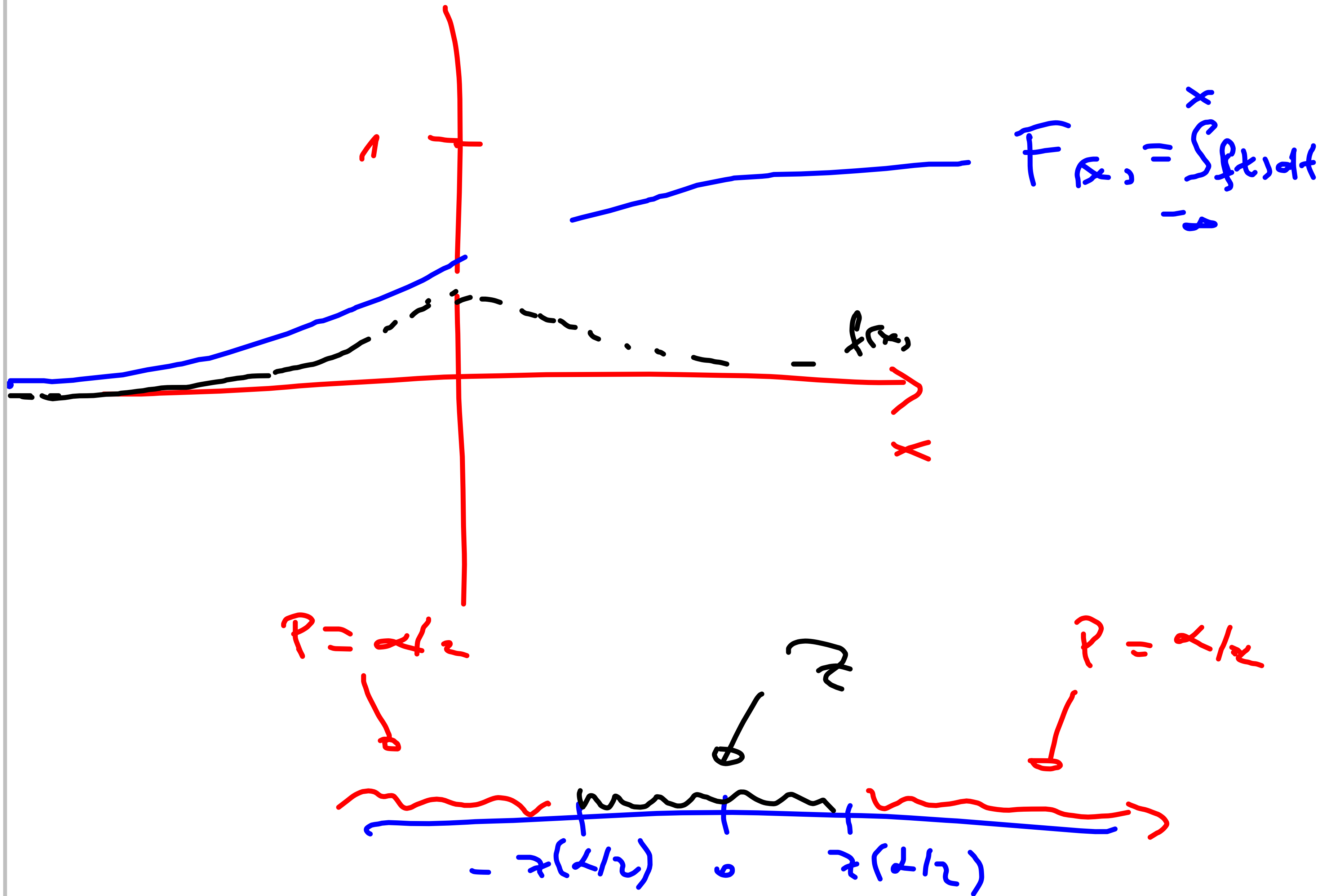
$$\underbrace{P(X \leq a)} = \int_{-\infty}^{a} f(x)\,dx = \underbrace{F(x)}$$

N ... počet jednotek v populaci

W_i, $i = 1, \ldots, N$

$$X \cong N(\mu, \operatorname{var} X)$$

$$\longrightarrow Z \cong N(0, 1)$$


1
$F(x) = \int_{-\infty}^{x} f(t)\,dt$
$f(x)$
x
$P = \alpha/2$
z
$P = \alpha/2$
$-z(\alpha/2)$
0
$z(\alpha/2)$

$$X \simeq N(\underset{\text{neznámé}}{\boxed{\mu}}, \underset{\text{známé}}{\sigma})$$

$\varepsilon > 0$ libovolné pevné.

Čebyšev nerovnost:

$$\underbrace{P(|X-EX|\geq\varepsilon)}\leq\frac{\operatorname{var}X}{\varepsilon^2}$$

Dk. $\operatorname{var}X = \int_{-\infty}^{\infty}(x-\mu)^2 f(x)\,dx$

$$= \int_{|x-\mu|\geq\varepsilon}\underbrace{(x-\mu)^2}_{\geq\varepsilon^2} f(x)\,dx + \underbrace{\int_{|x-\mu|<\varepsilon}(x-\mu)^2 f(x)\,dx}_{\geq 0}$$

$$\geq \int_{|x-\mu|\geq\varepsilon}\varepsilon^2 f(x)\,dx = \varepsilon^2\underbrace{P(|X-\mu|\geq\varepsilon)}.$$

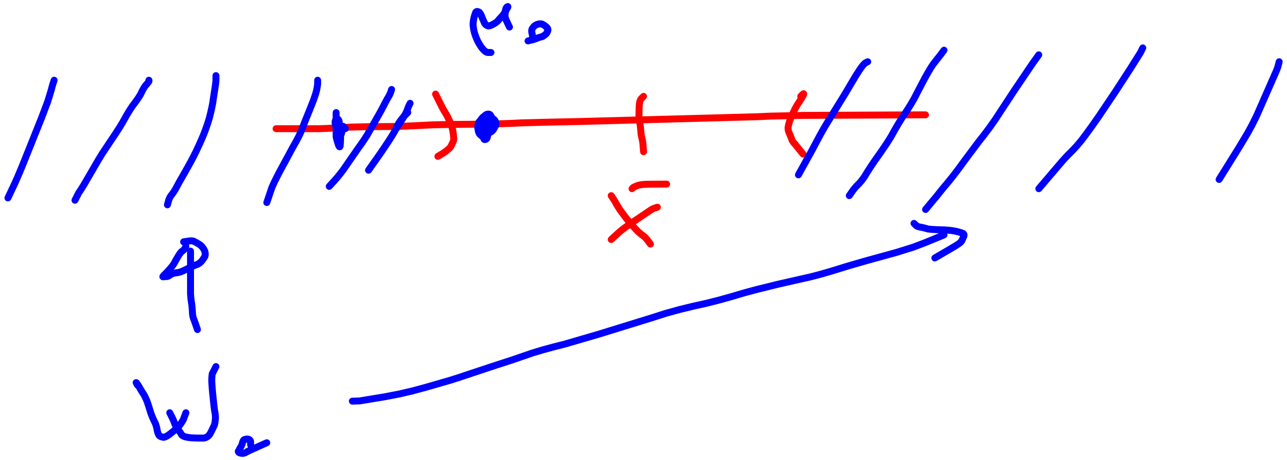
$$\Rightarrow \quad P\left(|T_n - ET_n| < \varepsilon/2\right) \geq 1 - \frac{\boxed{\operatorname{var} T_n} \to 0}{(\varepsilon/2)^2}$$

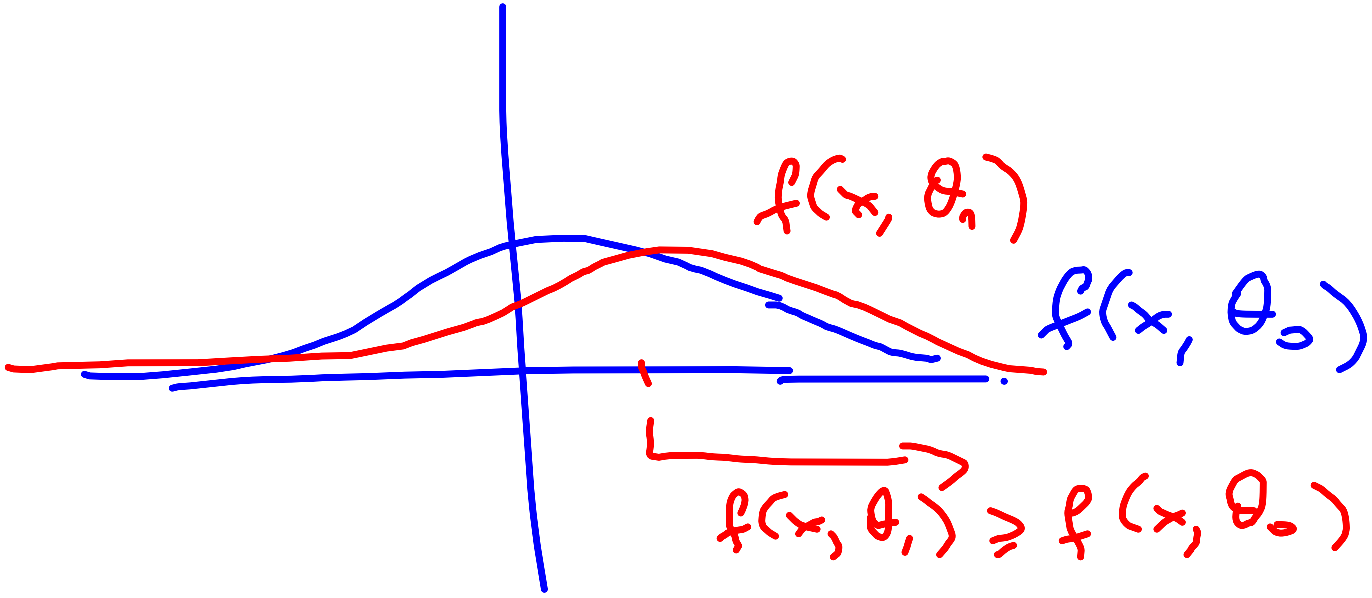
a zároveň pro velké $n > n_0$

$$P(|T_n - \theta| < \varepsilon) \geq P\big(|T_n - ET_n| < \varepsilon/2, \ \underbrace{|ET_n - \theta| < \varepsilon/2}_{\text{už jistě pro } n > n_0}\big)$$

$$= P(|T_n - ET_n) < \varepsilon/2) \xrightarrow{} 1$$

rozhodnutí	skutečnost	
	H_0 platí	H_0 neplatí
zamítnout H_0	chyba 1. druhu	—
nezamítnout H_0	—	chyba 2. druhu




$f(x, \theta_1)$
$f(x, \theta_0)$
$f(x, \theta_1) > f(x, \theta_0)$

W, W_c :

$$W = (W - W_c) \cup (W \cap W_c)$$

$$W_c = \underline{(W_c - W)} \cup \underline{(W \cap W_c)}$$ disjunkt:

$$\Delta := \int_{W_c} f(x,\theta_1) - \int_{W} f(x,\theta_1)$$

$$= \int_{W_c - W} f(x,\theta_1) + \cancel{\int_{W \cap W_c} f(x,\theta_1)} - \cancel{\int_{W \cap W_c} f(x,\theta_1)} - \int_{W - W_c} f(x,\theta_1)$$

$$\geq c \int_{\underset{W_c}{\cancel{W_c - W}}} f(x,\theta_0) - c \int_{\underset{W}{\cancel{W - W_c}}} f(x,\theta_0) = c(\alpha - \alpha) = 0$$