T_{10}

d) $x_{min} < C$

$$P(\vec{x}_n \in C \mid H_0) = \alpha$$

$$P(\vec{x}_n < C \mid H_0) = \alpha$$

$$H_0: \xi \sim R(0,1)$$

$$H_1: \xi \sim p(x) = \frac{e^{1-x}}{e-1} \{(0,1)\}$$

$$\alpha = P(x_{min} < C) = 1 - (1 - F_0(C))^n$$

$$(1 - F_0(C))^n = 1 - \alpha$$

$$1 - C = (1-\alpha)^{\frac{1}{n}}$$

$$C = 1 - (1-\alpha)^{\frac{1}{n}}$$

$$G_{kp}: \; x_{min} < 1 - (1-\alpha)^{\frac{1}{n}}$$

$$\alpha_1 = \alpha$$

$$W = P(\vec{x}_n \in G_{kp} \mid H_1) =$$

$$= P\left(x_{min} < 1-(1-\alpha)^{\frac{1}{n}} \mid H_1\right)$$

$$F_1 = \frac{e}{e-1}(1-e^{-x})$$

$$W = 1-(1-F_1(1-(1-\alpha)^{\frac{1}{n}}))^n =$$

$$= 1-\left(1-\frac{e}{e-1}\left(1-e^{-1+(1-\alpha)^{\frac{1}{n}}}\right)\right)^n$$

1) $e^{-1}\cdot e^{(1-\alpha)^{\frac{1}{n}}} = 1+\frac{\ln(1-\alpha)}{n}+o\left(\frac{1}{n}\right)$

2) $e^{e^{\frac{1}{n}\ln(1-\alpha)}} = e^{\left(1+\frac{\ln(1-\alpha)}{n}+o\left(\frac{1}{n}\right)\right)} = e\cdot e^{\frac{\ln(1-\alpha)}{n}+o\left(\frac{1}{n}\right)} =$

$$= e\left(1+\frac{\ln(1-\alpha)}{n}+o\left(\frac{1}{n}\right)\right)$$

3) $\left(1+\frac{e}{e-1}\frac{\ln(1-\alpha)}{n}+o\left(\frac{1}{n}\right)\right)^n = e^{\frac{e\ln(1-\alpha)}{e-1}}$

4) $1-e^{\frac{e\ln(1-\alpha)}{e-1}} \Rightarrow W \underset{n\to\infty}{\to} 1-e^{\frac{e\ln(1-\alpha)}{e-1}} \neq 1$ не сост

$\alpha_2 = 1-W$ $\alpha_2 \underset{n\to\infty}{\to} e^{\frac{e\ln(1-\alpha)}{e-1}}$

при $\alpha = 0,05$

$W = 0,078$

$\alpha_2 = 0,922$