1302

Binomial distribution

X - number of experiments cover the corresponding constant

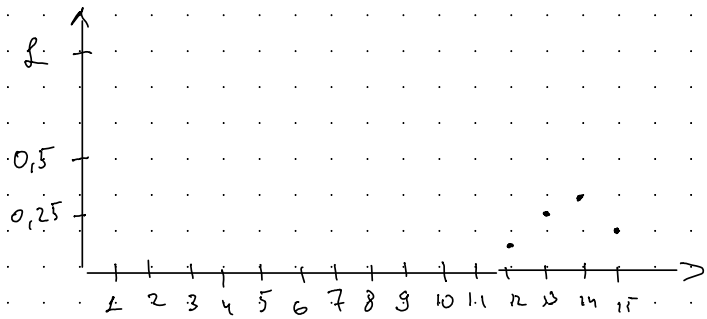
p - 0,9 conf level

$X \sim Bin(15, p)$

a)

$P(X=15) = p^{15} \cdot q^0 = 0,205$

b)



1302

X - life time of el. bulb $x = 1000$

$f_X(x) = \frac{1}{\theta} e^{\frac{-x}{\theta}}$ $x \geq 0$

θ - mean life time

conf. level 0,95

$\alpha = 0,05$

$$P\left(b_1(\theta) < X < b_2(\theta)\right)$$

$b_1(\theta) = \theta(1 - 0,025)$

$b_2(\theta) = \theta(1 + 0,025)$

$a_1(X) = \frac{X}{1-0,025}$ $b_2^{-1}(\cdot)$

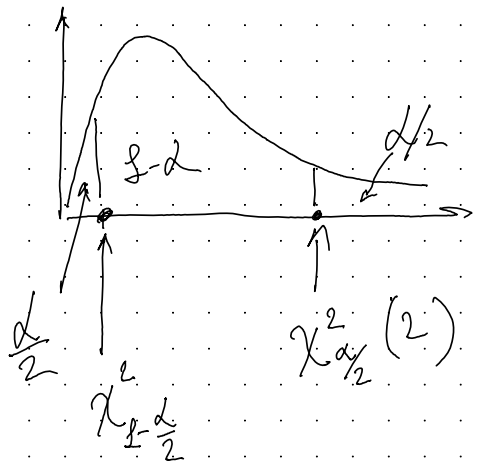
$a_2(X) = \frac{X}{1+0,025}$ $b_1^{-1}(\cdot)$

$$P\left(a_2(x) < \theta < a_1(X)\right) = 0,95$$

$I_\theta = (975,61 ; 1025,64$

Chi-squared for $f=0$ is exponential

$\alpha = 0{,}05$



$\chi^2_{0,97.5}(2) = 0{,}05$

$\chi^2_{0,025}(2) = 7{,}38$