$$i2 := 0 .. 25 \qquad N_0 := 26$$

$$N_{i2+1} := N_{i2} - 1 \qquad N1_{i2} := \frac{N_{i2} + N_{i2+1}}{2}$$

$$P_{i2} := 1 - \frac{i2}{N_0} \qquad f_{i2} := \frac{1}{N_0 \cdot \Delta tt_{i2}} \qquad \lambda_{i2} := \frac{1}{N1_{i2} \cdot \Delta tt_{i2}}$$

$$\Delta tt := \begin{pmatrix} 130 \\ 136 \\ 141 \\ 148 \\ 154 \\ 163 \\ 170 \\ 180 \\ 190 \\ 203 \\ 214 \\ 228 \\ 247 \\ 267 \\ 290 \\ 316 \\ 350 \\ 391 \\ 444 \\ 513 \\ 606 \\ 741 \\ 950 \\ 1330 \\ 2222 \\ 6660 \end{pmatrix}$$

P_{i2} =	f_{i2} =	λ_{i2} =
1	2.959·10-4	3.017·10-4
0.962	2.828·10-4	3.001·10-4
0.923	2.728·10-4	3.018·10-4
0.885	2.599·10-4	3.003·10-4
0.846	2.498·10-4	3.02·10-4
0.808	2.36·10-4	2.993·10-4
0.769	2.262·10-4	3.017·10-4
0.731	2.137·10-4	3.003·10-4
0.692	2.024·10-4	3.008·10-4
0.654	1.895·10-4	2.986·10-4
0.615	1.797·10-4	3.015·10-4
0.577	1.687·10-4	3.025·10-4
0.538	1.557·10-4	2.999·10-4
0.5	1.441·10-4	2.996·10-4
0.462	1.326·10-4	2.999·10-4
...	...	...

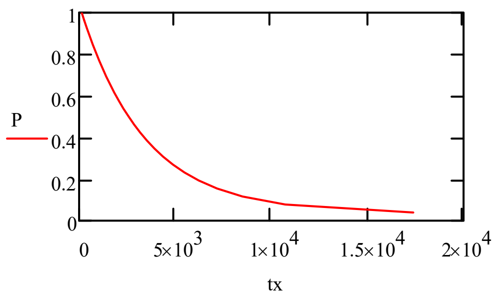
$$tx_{i2} := \sum_{i1=0}^{i2} \Delta tt_{i1}$$

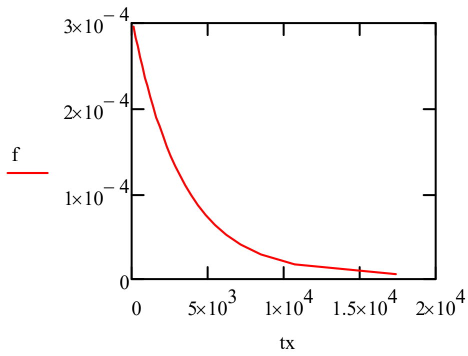
tx =

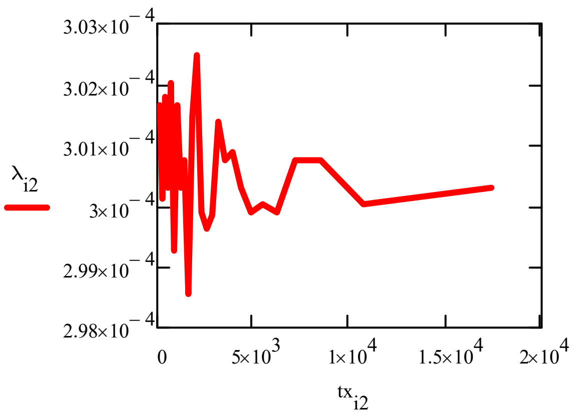
	0
0	130
1	266
2	407
3	555
4	709
5	872
6	1.042·103
7	1.222·103
8	1.412·103
9	1.615·103
10	1.829·103
11	2.057·103
12	2.304·103
13	2.571·103
14	2.861·103
15	...

Δtt =

	0
0	130
1	136
2	141
3	148
4	154
5	163
6	170
7	180
8	190
9	203
10	214
11	228
12	247
13	267
14	290
15	...







$Tcp := mean(tx)$ $\sigma := stdev(tx)$

$Tcp = 3.661 \times 10^3$ $\sigma = 3.815 \times 10^3$ $\frac{\sigma}{Tcp} = 1.042$

Из графиков видно, что распределение времени наработки до отказа изменяется по экспоненциальному закону.

$$\left(f_i - d\cdot e^{d\cdot t_i}\right)^2$$

$$\frac{d}{dg}\left(r - g\cdot e^{-g\cdot y}\right)^2 \rightarrow -2\cdot\left(r - g\cdot e^{-g\cdot y}\right)\cdot\left(e^{-g\cdot y} - g\cdot y\cdot e^{-g\cdot y}\right)$$

$$(r - g\cdot \exp(-g\cdot y))\cdot(-\exp(-g\cdot y) + g\cdot y\cdot \exp(-g\cdot y))$$

$$\sum_{r=1}^{25}\left(f_r\right)^2 = 6.963\times 10^{-7}$$

$$\frac{-1}{\exp(g\cdot y)}\cdot r + \frac{1}{\exp(g\cdot y)}\cdot r\cdot g\cdot y + \frac{1}{\exp(g\cdot y)^2}\cdot g - \frac{1}{\exp(g\cdot y)^2}\cdot g^2\cdot y$$

$g := 1$

$$s1 := \mathrm{root}\left[\sum_{i=0}^{N_0-1}\left(f_i\cdot tx_i\cdot g - f_i - g^2\cdot tx_i\cdot e^{-g\cdot tx_i} + g\cdot e^{-g\cdot tx_i}\right), g\right]$$

$s1 = 2.998\times 10^{-4}$

$g := 0.5$

Given

$$\sum_{i=0}^{N_0-1}\left(f_i\cdot tx_i\cdot g - f_i - g^2\cdot tx_i\cdot e^{-g\cdot tx_i} + g\cdot e^{-g\cdot tx_i}\right) = 0$$

$g := \mathrm{Find}(g)$ $\quad ff(t) := g\cdot e^{-g\cdot t}$ $\quad g = 2.998\times 10^{-4}$

$$\frac{1}{Tcp} = 2.731\times 10^{-4}$$

$$fff(t) := \frac{1}{Tcp}\cdot e^{-\frac{1}{Tcp}\cdot t}$$

ff(tx) =

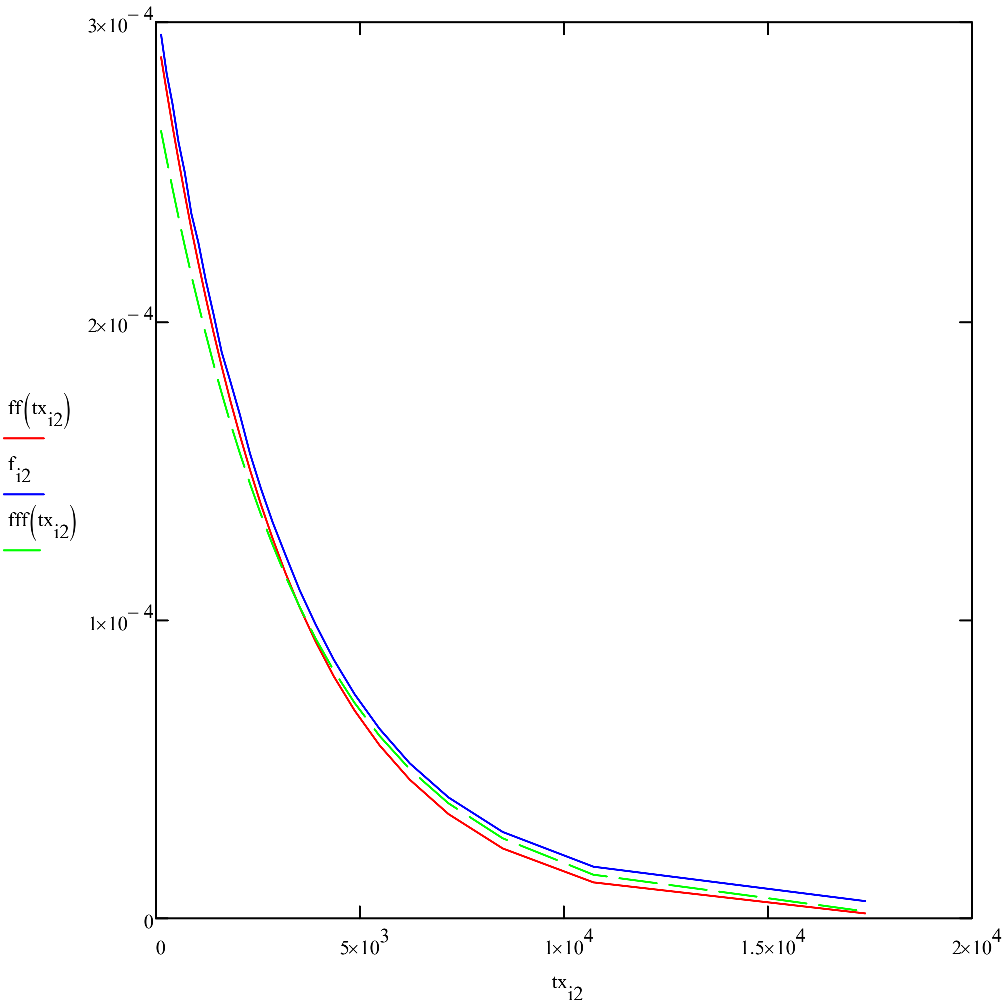
	0
0	$2.883 \cdot 10^{-4}$
1	$2.768 \cdot 10^{-4}$
2	$2.654 \cdot 10^{-4}$
3	$2.538 \cdot 10^{-4}$
4	$2.424 \cdot 10^{-4}$
5	$2.308 \cdot 10^{-4}$
6	$2.194 \cdot 10^{-4}$
7	$2.078 \cdot 10^{-4}$
8	$1.963 \cdot 10^{-4}$
9	$1.847 \cdot 10^{-4}$
10	$1.733 \cdot 10^{-4}$
11	$1.618 \cdot 10^{-4}$
12	$1.503 \cdot 10^{-4}$
13	$1.387 \cdot 10^{-4}$
14	$1.272 \cdot 10^{-4}$
15	...

fff(tx) =

	0
0	$2.636 \cdot 10^{-4}$
1	$2.54 \cdot 10^{-4}$
2	$2.444 \cdot 10^{-4}$
3	$2.347 \cdot 10^{-4}$
4	$2.25 \cdot 10^{-4}$
5	$2.152 \cdot 10^{-4}$
6	$2.055 \cdot 10^{-4}$
7	$1.956 \cdot 10^{-4}$
8	$1.857 \cdot 10^{-4}$
9	$1.757 \cdot 10^{-4}$
10	$1.657 \cdot 10^{-4}$
11	$1.557 \cdot 10^{-4}$
12	$1.456 \cdot 10^{-4}$
13	$1.353 \cdot 10^{-4}$
14	$1.25 \cdot 10^{-4}$
15	...

f_{i2} =

$2.959 \cdot 10^{-4}$
$2.828 \cdot 10^{-4}$
$2.728 \cdot 10^{-4}$
$2.599 \cdot 10^{-4}$
$2.498 \cdot 10^{-4}$
$2.36 \cdot 10^{-4}$
$2.262 \cdot 10^{-4}$
$2.137 \cdot 10^{-4}$
$2.024 \cdot 10^{-4}$
$1.895 \cdot 10^{-4}$
$1.797 \cdot 10^{-4}$
$1.687 \cdot 10^{-4}$
$1.557 \cdot 10^{-4}$
$1.441 \cdot 10^{-4}$
$1.326 \cdot 10^{-4}$
...



$$\text{histogram}(3, tx) = \begin{pmatrix} 3.006 \times 10^{3} & 21 \\ 8.757 \times 10^{3} & 4 \\ 1.451 \times 10^{4} & 1 \end{pmatrix}$$

$$TЭ := \frac{\sum_{i=0}^{N_0-1} \Delta tt_i}{N_0}$$

$$TЭ = 668.615$$

$$CKO := \sqrt{\frac{\sum_{i=0}^{N_0-1} \left(\Delta tt_i - TЭ\right)^2}{N_0 - 1}}$$

$$tc := \sum_{i=0}^{N_0-1} \Delta tt_i$$

$$CKO = 1.306 \times 10^3$$

$$tc = 1.738 \times 10^4$$

$$dt\left(\alpha, N_0 - 1\right) = ■$$

$$Tn := tc - dt\left(\alpha, N_0 - 1\right) \cdot \frac{CKO}{N_0}$$

$$Tn = ■$$

$$Tв := tc - dt\left(1 - \alpha, N_0 - 1\right) \cdot \frac{CKO}{N_0}$$

$$Tв = ■$$