T=TTT (Total Time on Test)
r=number of failures

	I, fixed t_0	II, fixed r
one-sided (lower) $P(MTTF > \vartheta_1) = \alpha$  	$\vartheta_1 = \dfrac{2T}{\chi^2_\alpha(2r+2)}$ #of degrees of freedom percentile	$\vartheta_1 = \dfrac{2T}{\chi^2_\alpha(2r)}$
two-sided (lower and upper)	$(\vartheta_1, \vartheta_2) = \left(\dfrac{2T}{\chi^2_{\frac{1+\alpha}{2}}(2r+2)}, \dfrac{2T}{\chi^2_{\frac{1-\alpha}{2}} 2r}\right)$	$(\vartheta_1, \vartheta_2) = \left(\dfrac{2T}{\chi^2_{\frac{1+\alpha}{2}}(2r)}, \dfrac{2T}{\chi^2_{\frac{1-\alpha}{2}}(2r)}\right)$

$P(\vartheta_1 < MTTF < \vartheta_2) = \alpha$

α Percentile values of the $\chi^2(f)$ distribution

f \ α	0.005	0.025	0.050	0.900	0.950	0.975	0.990	0.995	0.999
1	0.0439	0.03982	0.02393	2.71	3.84	5.02	6.63	7.88	10.8
2	0.0100	0.0506	0.103	4.61	5.99	7.38	9.21	10.6	13.8
3	0.0717	0.216	0.352	6.25	7.81	9.35	11.3	12.S	16.3
4	0.207	0.484	0.711	7.78	9.49	11.1	13.3	14.9	18.5
5	0.412	0.831	1.15	9.24	11.1	12.8	15.1	16.7	20.5
6	0.676	1.24	1.64	10.6	12.6	14.4	16.8	18.5	22.5
7	0.989	1.69	2.17	12.0	14.1	16.0	18.5	20.3	24.3
8	1.34	2.18	2.73	13.4	15.5	17.5	20.1	22.0	26.1
9	1.73	2.70	3.33	14.7	16.9	19.0	21.7	23.6	27.9
10	2.16	3.25	3..94	16.0	18.3	20.5	23.2	25.2	29.6
11	2.60	3.82	4.57	17.3	19.7	21.9	24.7	26.&	31.3
12	3.07	4.40	5.23	18.5	21.0	23.3	26.2	28.3	32.9
13	3.57	5.01	5.89	19.8	22.4	24.7	27.7	29.8	34.5
14	4.07	5.63	6.57	21-1	23.7	26.1	29.1	31.3	36.1
15	4.60	6.26	7.26	22.3	25.0	27.5	30.6	32.8	37.7
16	5.14	6.91	7.96	23.5	26.3	28.8	32.0	34.3	39.3
17	5.70	7.56	8.67	24.8	27.6	30.2	33.4	35.7	40.8
18	6.26	8.23	9.39	26.0	28.9	31.5	34.8	37.2	42.3
19	6.84	8.91	10.1	27.2	30.1	32.9	36.2	38.6	43.8
20	7.43	9.59	10.9	28.4	31.4	34.2	37.6	40.0	45.3
21	8.03	10.3	11.6	29.6	32.7	35.5	38.9	41.4	46.8
22	8.64	11.0	12.3	30.8	33.9	36.8	40.3	42.8	48.3
23	9.26	11.7	13.1	32.0	35.2	38.1	41.6	44.2	19.7
24	9.89	12.4	13.8	33.2	36.4	39.4	43.0	45.6	51.2
25	10.5	13.1	14.6	34.4	37.7	40.6	44.3	46.9	52.6
26	11.2	13.8	15.4	35.6	38.9	41.9	45.6	48.3	54.1
27	11.8	14.6	16.2	36.7	40.1	43.2	47.0	49.6	55.5
28	12.5	15.3	16.9	37.9	41.3	44.5	48.3	51-0	56.9
29	13.1	16.0	17.7	39.1	42.6	45.7	49.6	52.3	58.3
30	13.8	16.8	18.5	40.3	43.8	47.0	50.9	53.7	59.7
35	17.2	20.6	22.5	46.1	49.8	53.2	57.3	60.3	66.6
40	20.7	24.4	26.5	51.8	55.8	59.3	63.7	66.8	73.4
45	24.3	28.4	30.6	57.5	61.7	65.4	70.0	73.2	80.1
50	28.0	32.4	34.8	63.2	67.5	71.4	76.2	79.5	86.7

Basic random variable	Parameter	Prior and posterior distributions of parameter	Mean and Variance of Parameter	Posterior Statistics
Binomial $p_X(x) = \binom{n}{x}\theta^x(1-\theta)^{n-x}$	θ	Beta $f_\Theta(\theta) = \frac{\Gamma(q+r)}{\Gamma(q)\Gamma(r)}\theta^{q-1}(1-\theta)^{r-1}$	$E(\Theta) = \frac{q}{q+r}$ $\mathrm{Var}(\Theta) = \frac{qr}{(q+r)^2(q+r+1)}$	$q'' = q' + x$ $r'' = r' + n - x$
Exponential $f_X(x) = \lambda e^{-\lambda x}$	λ	Gamma $f_\Lambda(\lambda) = \frac{\nu(\nu\lambda)^{k-1}e^{-\nu\lambda}}{\Gamma(k)}$	$E(\lambda) = \frac{k}{\nu}$ $\mathrm{Var}(\lambda) = \frac{k}{\nu^2}$	$\nu'' = \nu' + \sum_i x_i$ $k'' = k' + n$
Normal $f_X(x) = \frac{1}{\sqrt{2\pi}\sigma}\exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$ (with known σ)	μ	Normal $f_M(\mu) = \frac{1}{\sqrt{2\pi}\sigma_\mu}\exp\left[-\frac{1}{2}\left(\frac{\mu-\mu_\mu}{\sigma_\mu}\right)^2\right]$	$E(\mu) = \mu_\mu$ $\mathrm{Var}(\mu) = \sigma_\mu^2$	$\mu_\mu'' = \frac{\mu_\mu'(\sigma^2/n) + \bar{x}\sigma_\mu'^2}{\sigma^2/n + (\sigma_\mu')^2}$ $\sigma_\mu'' = \sqrt{\frac{(\sigma_\mu')^2(\sigma^2/n)}{(\sigma_\mu')^2 + \sigma^2/n}}$
Normal $f_X(x) = \frac{1}{\sqrt{2\pi}\sigma}\exp\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$	μ, σ	Gamma-Normal $f(\mu, \sigma)$ $= \left\{\frac{1}{\sqrt{2\pi}\sigma/n}\exp\left[-\frac{1}{2}\left(\frac{\mu-\bar{x}}{\sigma/\sqrt{n}}\right)^2\right]\right\}$ $\cdot\left\{\frac{[(n-1)/2]^{(n+1)/2}}{\Gamma[(n+1)/2]}\left(\frac{s^2}{\sigma^2}\right)^{(n-1)/2}\right.$ $\left.\cdot\exp\left(-\frac{n-1}{2}\frac{s^2}{\sigma^2}\right)\right\}$	$E(\mu) = \bar{x}$ $\mathrm{Var}(\mu) = s^2\left[\frac{n-1}{n(n-3)}\right]$ $E(\sigma) = s\sqrt{\frac{n-1}{2}}\frac{\Gamma[(n-2)/2]}{\Gamma[(n-1)/2]}$ $\mathrm{Var}(\sigma) = s^2\left(\frac{n-1}{n-3}\right) - E^2(\sigma)$	$n'' = n' + n$ $n''\bar{x}'' = n'\bar{x}' + n\bar{x}$ $(n''-1)s''^2 + n''\bar{x}''^2$ $= [(n'-1)s'^2 + n'\bar{x}'^2]$ $+ [(n-1)s^2 + n\bar{x}^2]$
Poisson $p_X(x) = \frac{(\mu t)^x}{x!}e^{-\mu t}$	μ	Gamma $f_M(\mu) = \frac{\nu(\nu\mu)^{k-1}e^{-\nu\mu}}{\Gamma(k)}$	$E(\mu) = \frac{k}{\nu}$ $\mathrm{Var}(\mu) = \frac{k}{\nu^2}$	$\nu'' = \nu' + t$ $k'' = k' + x$
Lognormal $f_X(x) = \frac{1}{\sqrt{2\pi}\zeta x}\cdot\exp\left[-\frac{1}{2}\left(\frac{\ln x - \lambda}{\zeta}\right)^2\right]$ (with known ζ)	λ	Normal $f_\Lambda(\lambda) = \frac{1}{\sqrt{2\pi}\sigma}\exp\left[-\frac{1}{2}\left(\frac{\lambda-\mu}{\sigma}\right)^2\right]$	$E(\lambda) = \mu$ $\mathrm{Var}(\lambda) = \sigma^2$	$\mu'' = \frac{\mu'(\zeta^2/n) + \sigma^2\overline{\ln x}}{\zeta^2/n + \sigma^2}$ $\sigma'' = \sqrt{\frac{\sigma^2(\zeta^2/n)}{\sigma^2 + \zeta^2/n}}$