# Nevezetes eloszlások

## *Diszkrét*

| Név | Eloszlás | | Várható érték | Szórás |
|---|---|---|---|---|
| **Bernoulli**<br>(indikátor változó)<br>$X \sim I(p)$ | $P(X=1)=p$<br>$P(X=0)=1-p$ | | $p$ | $\sqrt{p\cdot(1-p)}$ |
| **Binomiális**<br>(visszatevéses mintavétel)<br>$X \sim B_n(p)$ | $P(X=k)=\binom{n}{k}\cdot p^k(1-p)^{n-k}$, | k = 0, 1, 2, …, n | $np$ | $\sqrt{np\cdot(1-p)}$ |
| **Geometriai**<br>(k-adikra következik be A)<br>$X \sim G(p)$ | $P(X=k)=p\cdot(1-p)^{k-1}$, | k = 1, 2, … | $\frac{1}{p}$ | $\frac{\sqrt{1-p}}{p}$ |
| **Negatív binomiális vagy Pascal**<br>(k-adikra következik be m-edszer A)<br>$X \sim Nb_m(p)$ | $P(X=k)=\binom{k-1}{m-1}\cdot p^m(1-p)^{k-m}$, | k = m, m+1, … | $\frac{m}{p}$ | $\sqrt{m}\cdot\frac{\sqrt{1-p}}{p}$ |
| **Hipergeometriai**<br>(visszatevés nélküli mintavétel)<br>$X \sim Hg(N, M, n)$<br>$M<N,\ n\le \min\{M, N-M\}$ | $P(X=k)=\frac{\binom{M}{k}\binom{N-M}{n-k}}{\binom{N}{n}}$, | k = 0, 1, 2, …, n | $n\frac{M}{N}$ | $\sqrt{n\frac{M}{N}\left(1-\frac{M}{N}\right)\left(1-\frac{M-1}{N-1}\right)}$ |
| **Poisson**<br>$X \sim P(\lambda)$ | $P(X=k)=\frac{\lambda^k}{k!}\cdot e^{-\lambda}$, | k = 0, 1, 2, … | $\lambda$ | $\sqrt{\lambda}$ |
| {1, 2, …, n}-en **Egyenletes**<br>$X \sim E(1, 2, \dots, n)$ | $P(X=k)=\frac{1}{n}$, | k = 1, 2, …, n | $\frac{n+1}{2}$ | $\frac{\sqrt{n^2-1}}{2\sqrt{3}}$ |

## *Abszolút folytonos*

| Név | Sűrűségfüggvény | Eloszlásfüggvény | Várható érték | Szórás |
|---|---|---|---|---|
| [a,b]-n **Egyenletes**<br>$X \sim U[a,b]$ | $f(x)=\frac{1}{b-a}$, $a\le x\le b$ | $F(x)=\frac{x-a}{b-a}$, $a\le x\le b$ | $\frac{a+b}{2}$ | $\frac{b-a}{2\sqrt{3}}$ |
| **Exponenciális**<br>$X \sim Exp(\lambda)$ | $f(x)=\lambda e^{-\lambda x}$, x>0 | $F(x)=1-e^{-\lambda x}$, x>0 | $\frac{1}{\lambda}$ | $\frac{1}{\lambda}$ |
| **Cauchy**<br>$X \sim C(\vartheta,\sigma),\ \sigma>0$ | $f(x)=\frac{1}{\pi\sigma}\frac{1}{1+(\frac{x-\vartheta}{\sigma})^2}$ | $F(x)=\frac{1}{2}+\frac{1}{\pi}arctg\frac{x-\vartheta}{\sigma}$ | *nem létezik* | *nem létezik* |
| **Gamma**<br>$\Gamma_\alpha(\lambda), \alpha, \lambda>0$ | $f(x)=\frac{\lambda^n x^{n-1}e^{-\lambda x}}{\Gamma(\alpha)}$ x>0 | $F(x)=\frac{\lambda^n}{(n-1)!}\cdot\int_0^x t^{n-1}e^{-\lambda t}dt$ x>0 | $\frac{\alpha}{\lambda}$ | $\frac{\sqrt{\alpha}}{\lambda}$ |
| **Gauss - Normális**<br>$X \sim N(\mu, \sigma^2)$ | $f(x)=\frac{1}{\sqrt{2\pi}\sigma}\cdot e^{-\frac{(x-\mu)^2}{2\sigma^2}}$ | $F(x)=\int_{-\infty}^x f(t)dt$ | $\mu$ | $\sigma$ |
| **Standard normális**<br>$X \sim N(0, 1)$ | $\varphi(x)=\frac{1}{\sqrt{2\pi}}\cdot e^{-\frac{x^2}{2}}$ | $\Phi(x)=$ *lásd a táblázatot!* | *0* | *1* |
| **Pareto**<br>$X \sim P(\alpha, \beta)$ $\alpha>0, \beta>0$ | $f(x)=\beta\alpha^\beta / x^{\beta+1}$ ha $x\ge\alpha$ | $F(x)=\int_\alpha^x f(t)dt$ | $\frac{\alpha\beta}{\beta-1}$ $\beta>1$ | $\sqrt{\frac{\alpha^2\beta}{(\beta-1)(\beta-2)}}$ $\beta>2$ |
| **Beta**<br>$X \sim B(a, b)$ a>0, b>0 | $f(x)=\frac{1}{B(a,b)}\cdot x^{a-1}(1-x)^{b-1}$, $0\le x\le 1$ | $F(x)=\int_0^x f(t)dt$ | $\frac{a}{a+b}$ | $\sqrt{\frac{ab}{(a+b)^2(a+b+1)}}$ |
| $\chi^2(n) \equiv \Gamma_{\frac{n}{2}}\left(\frac{1}{2}\right)$<br>$X=\sum_{i=1}^n X_i^2$<br>$X_1 \dots X_n \sim N(0, 1)$ fae. | $f(x)=x^{\frac{n}{2}-1}\cdot\frac{e^{-\frac{x}{2}}}{2^{\frac{n}{2}}\Gamma\left(\frac{n}{2}\right)}$ | $F(x)=\int_0^x f(t)dt,\ x>0$ | $n$ | $\sqrt{2n}$ |
| **Student t**<br>$X=\frac{Y}{\sqrt{Z/n}} \sim t(n)$<br>$Y \sim N(0, 1)$<br>$Z \sim \chi^2(n)$ fgtn! | $f(x)=\frac{1}{\sqrt{\pi\cdot n}}\frac{\Gamma\left(\frac{n+1}{2}\right)}{\Gamma\left(\frac{n}{2}\right)}\left(1+\frac{x^2}{n}\right)^{-\frac{n+1}{2}}$ | | 0 , ha n ≥2 | $\sqrt{\frac{n}{n-2}}$ , ha n ≥3 |
| **Fisher F**<br>$X=\frac{Y/n}{Z/m} \sim F(n, m)$<br>$Y \sim \chi^2(n)$<br>$Z \sim \chi^2(m)$ fgtn! | $f(x)=\frac{n\Gamma\left(\frac{n+m}{2}\right)\left(\frac{n}{m}x\right)^{\frac{n}{2}-1}}{m\Gamma\left(\frac{n}{2}\right)\Gamma\left(\frac{m}{2}\right)\left(1+\frac{n}{m}x\right)^{\frac{n+m}{2}}}$, $x>0$ | | $\frac{m}{m-2}$ ha m>2 | $\sqrt{\frac{2m^2(m+n-2)}{n(m-2)^2(m-4)}}$ m>4 |

$$\Gamma(\alpha)=\int_0^\infty x^{\alpha-1}e^{-x}dx,\ \alpha>0;\quad \Gamma(n)=(n-1)!,\quad B(a,b)=\frac{\Gamma(a)\cdot\Gamma(b)}{\Gamma(a+b)}.$$

# HIPOTÉZISVIZSGÁLAT

$s_n^2 = \frac{1}{n}\sum_{i=1}^n x_i^2 - \bar{x}^2$, $\quad s_n^{*2} = \frac{n}{n-1}s_n^2$, $\quad \hat{r} = \frac{\overline{xy} - \bar{x}\bar{y}}{s_X s_Y}$

$y = ax + b$ lineáris regresszió: $\hat{a} = \hat{r}\frac{s_Y}{s_X} = \frac{\overline{xy} - \bar{x}\bar{y}}{s_X^2}$, $\quad \hat{b} = \bar{y} - \hat{a}\cdot\bar{x}$.

u-próba:

1. Kétoldali, egymintás: $u = \frac{\bar{x}-\mu}{\sigma}\sqrt{n}$, $\quad u_{\epsilon/2} = \Phi^{-1}(1-\epsilon/2)$.
   konfidenciaintervallum $\mu$-re: $[\bar{x} - u_{\epsilon/2}\frac{\sigma}{\sqrt{n}}, \bar{x} + u_{\epsilon/2}\frac{\sigma}{\sqrt{n}}]$.
2. Egyoldali, egymintás: $u = \frac{\bar{x}-\mu}{\sigma}\sqrt{n}$, $\quad u_\epsilon = \Phi^{-1}(1-\epsilon)$.
3. Kétoldali, kétmintás: $u = \frac{\bar{x}-\bar{y}}{\sqrt{\sigma_1^2/n_1 + \sigma_2^2/n_2}}$, $\quad u_{\epsilon/2} = \Phi^{-1}(1-\epsilon/2)$.
4. Egyoldali, kétmintás: $u = \frac{\bar{x}-\bar{y}}{\sqrt{\sigma_1^2/n_1 + \sigma_2^2/n_2}}$, $\quad u_\epsilon = \Phi^{-1}(1-\epsilon)$.

t-próba:

1. Kétoldali, egymintás: $t = \frac{\bar{x}-\mu}{s_n^*}\sqrt{n}$, $\quad t_{\epsilon/2} =$ a $t_{n-1}$-eloszlás $1-\epsilon/2$-kvantilise.
   konfidenciaintervallum $\mu$-re: $[\bar{x} - t_{\epsilon/2}\frac{s_n^*}{\sqrt{n}}, \bar{x} + t_{\epsilon/2}\frac{s_n^*}{\sqrt{n}}]$.
2. Egyoldali, egymintás: $t = \frac{\bar{x}-\mu}{s_n^*}\sqrt{n}$, $\quad t_\epsilon =$ a $t_{n-1}$-eloszlás $1-\epsilon$-kvantilise.
3. Kétoldali, kétmintás: $t = \frac{\bar{x}-\bar{y}}{\sqrt{\frac{(n_1-1)\sigma_1^{*2} + (n_2-1)\sigma_2^{*2}}{n_1+n_2-2}}}\sqrt{\frac{n_1 n_2}{n_1+n_2}}$. $\quad t_{\epsilon/2} =$ a $t_{n_1+n_2-2}$-eloszlás $1-\epsilon/2$-kvantilise.
4. Egyoldali, kétmintás: $t = \frac{\bar{x}-\bar{y}}{\sqrt{\frac{(n_1-1)\sigma_1^{*2} + (n_2-1)\sigma_2^{*2}}{n_1+n_2-2}}}\sqrt{\frac{n_1 n_2}{n_1+n_2}}$. $\quad t_\epsilon =$ a $t_{n_1+n_2-2}$-eloszlás $1-\epsilon$-kvantilise.

$\chi^2$-próba:

1. Illeszkedésvizsgálat: $\chi^2 = \sum_{i=1}^r \frac{(\nu_i - np_i)^2}{np_i}$ összehasonlítva a $\chi_{r-1}$-eloszlás $(1-\epsilon)$-kvantilisével.
2. Homogenitásvizsgálat: $\chi^2 = nm\sum_{i=1}^r \frac{\left(\frac{\nu_i}{n} - \frac{\mu_i}{m}\right)^2}{\nu_i + \mu_i}$ összehasonlítva a $\chi_{r-1}$-eloszlás $(1-\epsilon)$-kvantilisével.
3. Függetlenségvizsgálat: $\chi^2 = n\sum_{i=1}^r\sum_{j=1}^s \frac{\left(\nu_{ij} - \frac{\nu_{i\cdot}\nu_{\cdot j}}{n}\right)^2}{\nu_{i\cdot}\nu_{\cdot j}}$ összehasonlítva a $\chi_{(r-1)(s-1)}$-eloszlás $(1-\epsilon)$-kvantilisével.

Typeset by $\mathcal{A}_\mathcal{M}\mathcal{S}$-TEX

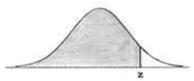


Welch: $t' = \frac{\bar{X} - \bar{Y}}{\sqrt{\frac{S_X^{*2}}{n_1} + \frac{S_Y^{*2}}{n_2}}}$, $\quad c = \frac{S_X^{*2}/n_1}{S_X^{*2}/n_1 + S_Y^{*2}/n_2}$, $\quad \frac{1}{f} = \frac{c^2}{n_1-1} + \frac{(1-c)^2}{n_2-1}$

$\mathcal{X}_k = \{(x,y) : |t'(x,y)| \geq t_{\epsilon/2}(f)\}$ 2-oldali

$\mathcal{X}_k = \{(x,y) : t'(x,y) \geq t_\epsilon(f)\}$ 1-oldali

# Standard normális eloszlás táblázat




Annak a valószínűsége, hogy a valószínűségi változó -oo és x közé esik

| x | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.5000 | 0.5040 | 0.5080 | 0.5120 | 0.5160 | 0.5199 | 0.5239 | 0.5279 | 0.5319 | 0.5359 |
| 0.1 | 0.5398 | 0.5438 | 0.5478 | 0.5517 | 0.5557 | 0.5596 | 0.5636 | 0.5675 | 0.5714 | 0.5753 |
| 0.2 | 0.5793 | 0.5832 | 0.5871 | 0.5910 | 0.5948 | 0.5987 | 0.6026 | 0.6064 | 0.6103 | 0.6141 |
| 0.3 | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 | 0.6368 | 0.6406 | 0.6443 | 0.6480 | 0.6517 |
| 0.4 | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.6700 | 0.6736 | 0.6772 | 0.6808 | 0.6844 | 0.6879 |
| 0.5 | 0.6915 | 0.6950 | 0.6985 | 0.7019 | 0.7054 | 0.7088 | 0.7123 | 0.7157 | 0.7190 | 0.7224 |
| 0.6 | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 | 0.7422 | 0.7454 | 0.7486 | 0.7517 | 0.7549 |
| 0.7 | 0.7580 | 0.7611 | 0.7642 | 0.7673 | 0.7704 | 0.7734 | 0.7764 | 0.7794 | 0.7823 | 0.7852 |
| 0.8 | 0.7881 | 0.7910 | 0.7939 | 0.7967 | 0.7995 | 0.8023 | 0.8051 | 0.8078 | 0.8106 | 0.8133 |
| 0.9 | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 | 0.8289 | 0.8315 | 0.8340 | 0.8365 | 0.8389 |
| 1.0 | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 | 0.8531 | 0.8554 | 0.8577 | 0.8599 | 0.8621 |
| 1.1 | 0.8643 | 0.8665 | 0.8686 | 0.8708 | 0.8729 | 0.8749 | 0.8770 | 0.8790 | 0.8810 | 0.8830 |
| 1.2 | 0.8849 | 0.8869 | 0.8888 | 0.8907 | 0.8925 | 0.8944 | 0.8962 | 0.8980 | 0.8997 | 0.9015 |
| 1.3 | 0.9032 | 0.9049 | 0.9066 | 0.9082 | 0.9099 | 0.9115 | 0.9131 | 0.9147 | 0.9162 | 0.9177 |
| 1.4 | 0.9192 | 0.9207 | 0.9222 | 0.9236 | 0.9251 | 0.9265 | 0.9279 | 0.9292 | 0.9306 | 0.9319 |
| 1.5 | 0.9332 | 0.9345 | 0.9357 | 0.9370 | 0.9382 | 0.9394 | 0.9406 | 0.9418 | 0.9429 | 0.9441 |
| 1.6 | 0.9452 | 0.9463 | 0.9474 | 0.9484 | 0.9495 | 0.9505 | 0.9515 | 0.9525 | 0.9535 | 0.9545 |
| 1.7 | 0.9554 | 0.9564 | 0.9573 | 0.9582 | 0.9591 | 0.9599 | 0.9608 | 0.9616 | 0.9625 | 0.9633 |
| 1.8 | 0.9641 | 0.9649 | 0.9656 | 0.9664 | 0.9671 | 0.9678 | 0.9686 | 0.9693 | 0.9699 | 0.9706 |
| 1.9 | 0.9713 | 0.9719 | 0.9726 | 0.9732 | 0.9738 | 0.9744 | 0.9750 | 0.9756 | 0.9761 | 0.9767 |
| 2.0 | 0.9772 | 0.9778 | 0.9783 | 0.9788 | 0.9793 | 0.9798 | 0.9803 | 0.9808 | 0.9812 | 0.9817 |
| 2.1 | 0.9821 | 0.9826 | 0.9830 | 0.9834 | 0.9838 | 0.9842 | 0.9846 | 0.9850 | 0.9854 | 0.9857 |
| 2.2 | 0.9861 | 0.9864 | 0.9868 | 0.9871 | 0.9875 | 0.9878 | 0.9881 | 0.9884 | 0.9887 | 0.9890 |
| 2.3 | 0.9893 | 0.9896 | 0.9898 | 0.9901 | 0.9904 | 0.9906 | 0.9909 | 0.9911 | 0.9913 | 0.9916 |
| 2.4 | 0.9918 | 0.9920 | 0.9922 | 0.9925 | 0.9927 | 0.9929 | 0.9931 | 0.9932 | 0.9934 | 0.9936 |
| 2.5 | 0.9938 | 0.9940 | 0.9941 | 0.9943 | 0.9945 | 0.9946 | 0.9948 | 0.9949 | 0.9951 | 0.9952 |
| 2.6 | 0.9953 | 0.9955 | 0.9956 | 0.9957 | 0.9959 | 0.9960 | 0.9961 | 0.9962 | 0.9963 | 0.9964 |
| 2.7 | 0.9965 | 0.9966 | 0.9967 | 0.9968 | 0.9969 | 0.9970 | 0.9971 | 0.9972 | 0.9973 | 0.9974 |
| 2.8 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 |
| 2.9 | 0.9981 | 0.9982 | 0.9982 | 0.9983 | 0.9984 | 0.9984 | 0.9985 | 0.9985 | 0.9986 | 0.9986 |
| 3.0 | 0.9987 | 0.9987 | 0.9987 | 0.9988 | 0.9988 | 0.9989 | 0.9989 | 0.9989 | 0.9990 | 0.9990 |

PERCENTAGE POINTS OF THE T DISTRIBUTION

| Tail Probabilities | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| One Tail | | 0.10 | 0.05 | 0.025 | 0.01 | 0.005 | 0.001 | 0.0005 | |
| Two Tails | | 0.20 | 0.10 | 0.05 | 0.02 | 0.01 | 0.002 | 0.001 | |
| D | 1 | 3.078 | 6.314 | 12.71 | 31.82 | 63.66 | 318.3 | 637 | 1 |
| E | 2 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 | 22.330 | 31.6 | 2 |
| G | 3 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 | 10.210 | 12.92 | 3 |
| R | 4 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 | 7.173 | 8.610 | 4 |
| E | 5 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 | 5.893 | 6.869 | 5 |
| E | 6 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 | 5.208 | 5.959 | 6 |
| S | 7 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 | 4.785 | 5.408 | 7 |
| | 8 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 | 4.501 | 5.041 | 8 |
| O | 9 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 | 4.297 | 4.781 | 9 |
| F | 10 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 | 4.144 | 4.587 | 10 |
| | 11 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 | 4.025 | 4.437 | 11 |
| F | 12 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 | 3.930 | 4.318 | 12 |
| R | 13 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 | 3.852 | 4.221 | 13 |
| E | 14 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 | 3.787 | 4.140 | 14 |
| E | 15 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 | 3.733 | 4.073 | 15 |
| D | 16 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 | 3.686 | 4.015 | 16 |
| O | 17 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 | 3.646 | 3.965 | 17 |
| M | 18 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 | 3.610 | 3.922 | 18 |
| | 19 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 | 3.579 | 3.883 | 19 |
| | 20 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 | 3.552 | 3.850 | 20 |
| | 21 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 | 3.527 | 3.819 | 21 |
| | 22 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 | 3.505 | 3.792 | 22 |
| | 23 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 | 3.485 | 3.768 | 23 |
| | 24 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 | 3.467 | 3.745 | 24 |
| | 25 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 | 3.450 | 3.725 | 25 |
| | 26 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 | 3.435 | 3.707 | 26 |
| | 27 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 | 3.421 | 3.690 | 27 |
| | 28 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 | 3.408 | 3.674 | 28 |
| | 29 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 | 3.396 | 3.659 | 29 |
| | 30 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 | 3.385 | 3.646 | 30 |
| | 32 | 1.309 | 1.694 | 2.037 | 2.449 | 2.738 | 3.365 | 3.622 | 32 |
| | 34 | 1.307 | 1.691 | 2.032 | 2.441 | 2.728 | 3.348 | 3.601 | 34 |
| | 36 | 1.306 | 1.688 | 2.028 | 2.434 | 2.719 | 3.333 | 3.582 | 36 |
| | 38 | 1.304 | 1.686 | 2.024 | 2.429 | 2.712 | 3.319 | 3.566 | 38 |
| | 40 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 | 3.307 | 3.551 | 40 |
| | 42 | 1.302 | 1.682 | 2.018 | 2.418 | 2.698 | 3.296 | 3.538 | 42 |
| | 44 | 1.301 | 1.680 | 2.015 | 2.414 | 2.692 | 3.286 | 3.526 | 44 |
| | 46 | 1.300 | 1.679 | 2.013 | 2.410 | 2.687 | 3.277 | 3.515 | 46 |
| | 48 | 1.299 | 1.677 | 2.011 | 2.407 | 2.682 | 3.269 | 3.505 | 48 |
| | 50 | 1.299 | 1.676 | 2.009 | 2.403 | 2.678 | 3.261 | 3.496 | 50 |
| | 55 | 1.297 | 1.673 | 2.004 | 2.396 | 2.668 | 3.245 | 3.476 | 55 |
| | 60 | 1.296 | 1.671 | 2.000 | 2.390 | 2.660 | 3.232 | 3.460 | 60 |
| | 65 | 1.295 | 1.669 | 1.997 | 2.385 | 2.654 | 3.220 | 3.447 | 65 |
| | 70 | 1.294 | 1.667 | 1.994 | 2.381 | 2.648 | 3.211 | 3.435 | 70 |
| | 80 | 1.292 | 1.664 | 1.990 | 2.374 | 2.639 | 3.195 | 3.416 | 80 |
| | 100 | 1.290 | 1.660 | 1.984 | 2.364 | 2.626 | 3.174 | 3.390 | 100 |
| | 150 | 1.287 | 1.655 | 1.976 | 2.351 | 2.609 | 3.145 | 3.357 | 150 |
| | 200 | 1.286 | 1.653 | 1.972 | 2.345 | 2.601 | 3.131 | 3.340 | 200 |

| khi-négyzet eloszlás farok percentilisei | | | | | |
|---|---|---|---|---|---|
| **df** | **0.1** | **0.05** | **0.025** | **0.01** | **0.005** |
| **1** | 2.706 | 3.841 | 5.024 | 6.635 | 7.879 |
| **2** | 4.605 | 5.991 | 7.378 | 9.210 | 10.597 |
| **3** | 6.251 | 7.815 | 9.348 | 11.345 | 12.838 |
| **4** | 7.779 | 9.488 | 11.143 | 13.277 | 14.860 |
| **5** | 9.236 | 11.070 | 12.833 | 15.086 | 16.750 |
| **6** | 10.645 | 12.592 | 14.449 | 16.812 | 18.548 |
| **7** | 12.017 | 14.067 | 16.013 | 18.475 | 20.278 |
| **8** | 13.362 | 15.507 | 17.535 | 20.090 | 21.955 |
| **9** | 14.684 | 16.919 | 19.023 | 21.666 | 23.589 |
| **10** | 15.987 | 18.307 | 20.483 | 23.209 | 25.188 |
| **11** | 17.275 | 19.675 | 21.920 | 24.725 | 26.757 |
| **12** | 18.549 | 21.026 | 23.337 | 26.217 | 28.300 |
| **13** | 19.812 | 22.362 | 24.736 | 27.688 | 29.819 |
| **14** | 21.064 | 23.685 | 26.119 | 29.141 | 31.319 |
| **15** | 22.307 | 24.996 | 27.488 | 30.578 | 32.801 |
| **16** | 23.542 | 26.296 | 28.845 | 32.000 | 34.267 |
| **17** | 24.769 | 27.587 | 30.191 | 33.409 | 35.718 |
| **18** | 25.989 | 28.869 | 31.526 | 34.805 | 37.156 |
| **19** | 27.204 | 30.144 | 32.852 | 36.191 | 38.582 |
| **20** | 28.412 | 31.410 | 34.170 | 37.566 | 39.997 |
| **21** | 29.615 | 32.671 | 35.479 | 38.932 | 41.401 |
| **22** | 30.813 | 33.924 | 36.781 | 40.289 | 42.796 |
| **23** | 32.007 | 35.172 | 38.076 | 41.638 | 44.181 |
| **24** | 33.196 | 36.415 | 39.364 | 42.980 | 45.559 |
| **25** | 34.382 | 37.652 | 40.646 | 44.314 | 46.928 |
| **26** | 35.563 | 38.885 | 41.923 | 45.642 | 48.290 |
| **27** | 36.741 | 40.113 | 43.195 | 46.963 | 49.645 |
| **28** | 37.916 | 41.337 | 44.461 | 48.278 | 50.993 |
| **29** | 39.087 | 42.557 | 45.722 | 49.588 | 52.336 |
| **30** | 40.256 | 43.773 | 46.979 | 50.892 | 53.672 |
| **40** | 51.805 | 55.758 | 59.342 | 63.691 | 66.766 |
| **50** | 63.167 | 67.505 | 71.420 | 76.154 | 79.490 |
| **60** | 74.397 | 79.082 | 83.298 | 88.379 | 91.952 |
| **70** | 85.527 | 90.531 | 95.023 | 100.425 | 104.215 |
| **80** | 96.578 | 101.879 | 106.629 | 112.329 | 116.321 |
| **90** | 107.565 | 113.145 | 118.136 | 124.116 | 128.299 |
| **100** | 118.498 | 124.342 | 129.561 | 135.807 | 140.169 |