A35A00310 Tuotantotalouden perusteet **Kaavoja (Krajewski)**

$$\frac{\sum_{i=1}^{n} x_i}{n} \quad \sqrt{\frac{\sum(x_i-\bar{x})^2}{n-1}} \quad \bar{\bar{x}}+z\sigma_{\bar{x}} \quad \bar{\bar{x}}-z\sigma_{\bar{x}} \quad \frac{\sigma}{\sqrt{n}} \quad \bar{\bar{x}}+A_2\bar{R} \quad \bar{\bar{x}}-A_2\bar{R} \quad D_4\bar{R} \quad D_3\bar{R}$$

$$\bar{p}+z\sigma_p \quad \bar{p}-z\sigma_p \quad \sqrt{\frac{\bar{p}\,(1-\bar{p})}{n}}$$

$$\bar{c}+z\sigma_c \quad \bar{c}-z\sigma_c \quad \sqrt{\bar{c}}$$

$$\text{Min.}\left(\frac{\bar{\bar{x}}-\text{LTL}}{3\sigma}, \frac{\text{UTL}-\bar{\bar{x}}}{3\sigma}\right) \quad \frac{\text{UTL}-\text{LTL}}{6\sigma}$$

n	A_2	D_3	D_4
2	1,880	0	3,267
3	1,023	0	2,575
4	0,729	0	2,282
5	0,577	0	2,115
6	0,483	0	2,004
7	0,419	0,076	1,924
8	0,373	0,136	1,864
9	0,337	0,184	1,816
10	0,308	0,223	1,777

$$\sqrt{\frac{2DS}{H}} \quad \frac{EOQ}{D \text{ tai } d} \quad dL \quad OH+SR-BO \quad \frac{Q}{2}(H)+\frac{D}{Q}(S) \quad dL+z\sigma_L \quad z\sigma_L \quad \sigma_t\sqrt{L}$$

$$\frac{Q}{2}(H)+\frac{D}{Q}(S)+Hz\sigma_L \quad z\sqrt{\bar{L}\sigma^2_{\text{kysyntä(t)}}+\bar{d}^2\sigma^2_{\text{toimitusaika}}} \quad \frac{Q}{2}(H)+\frac{D}{Q}(S)+PD$$

$$\sqrt{\frac{2DS}{H}}\sqrt{\frac{p}{p-d}} \quad \frac{Q}{2}\left(\frac{p-d}{p}\right)(H)+\frac{D}{Q}(S) \quad \frac{ELS}{D \text{ tai } d} \quad \frac{ELS}{p} \quad Q\left(\frac{p-d}{p}\right)$$

$$\frac{EOQ}{D \text{ tai } d} \quad d(P+L)+z\sigma_{P+L} \quad z\sigma_{P+L} \quad \sigma_t\sqrt{P+L} \quad T-IP \quad \frac{dP}{2}(H)+\frac{D}{dP}(S)+Hz\sigma_{P+L}$$

$$\rho=\frac{\lambda}{\mu} \quad \rho=\frac{\lambda}{s\mu} \quad \rho=1-P_0 \quad P_0=1-\rho \quad P_0=\left[\sum_{n=0}^{s-1}\frac{(\lambda/\mu)^n}{n!}+\frac{(\lambda/\mu)^s}{s!}\left(\frac{1}{1-\rho}\right)\right]^{-1}$$

$$P_0=\left[\sum_{n=0}^{N}\frac{N!}{(N-n)!}\left(\frac{\lambda}{\mu}\right)^n\right]^{-1} \quad L=\frac{\lambda}{\mu-\lambda} \quad L=\lambda W \quad L=N-\frac{\mu}{\lambda}(1-P_0) \quad L_q=\rho L$$

$$L_q=\frac{P_0\left(\frac{\lambda}{\mu}\right)^s\rho}{s!\,(1-\rho)^2} \quad L_q=N-\frac{\lambda+\mu}{\lambda}(1-P_0) \quad W=\frac{1}{\mu-\lambda} \quad W=W_q+\frac{1}{\mu}$$

$$W=\frac{L}{(N-L)\lambda} \quad W_q=\rho W \quad W_q=\frac{L_q}{\lambda} \quad W_q=\frac{L_q}{(N-L)\lambda}$$