

$$a) \text{ Median } \tilde{x} = \frac{x_{20} + x_{21}}{2} = \frac{127 + 128}{2} = 127.5$$

$$\text{unteres Quartil: } q_{0,25} = \frac{x_{10} + x_{11}}{2} = \frac{118 + 119}{2} = 118.5$$

$$\text{oberes Quartil: } q_{0,75} = \frac{x_{30} + x_{31}}{2} = \frac{135 + 136}{2} = 135.5$$

$$\text{Interquartilsabstand: } 135.5 - 118.5 = 17$$

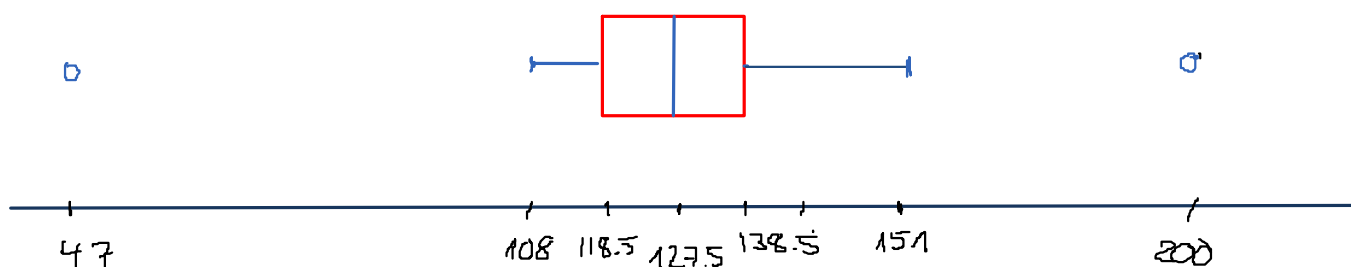
$$\text{Länge Whisker: } 1.5 \cdot 17 = 25.5$$

$$\begin{array}{r} 135.5 \\ + 25.5 \\ \hline 161 \end{array}$$

→ man nehme 151

$$\begin{array}{r} 118.5 \\ - 25.5 \\ \hline 93 \end{array}$$

→ man nehme 108



$$b) p(\text{Fehler}) = 1\% = 0.01 \quad n = 225$$

$$P(X \leq 3) = P(X=0) + P(X=1) + P(X=2) + P(X=3)$$

$$= \binom{225}{0} \cdot 0.01^0 \cdot 0.99^{225}$$

$$+ \binom{225}{1} \cdot 0.01^1 \cdot 0.99^{224}$$

$$+ \binom{225}{2} \cdot 0.01^2 \cdot 0.99^{223}$$

$$+ \binom{225}{3} \cdot 0.01^3 \cdot 0.99^{222}$$

$$= 0.10421 + 0.23684 + 0.26794 + 0.20118$$

$$= 0.81017 \approx 81\%$$

c) 0.5 Promille  $\hat{=} p = 0.0005$

$$P(X \geq 1) = 0.5 \quad n \text{ gesucht}$$

$$\Leftrightarrow 1 - P(X=0) = 0.5$$

$$\Leftrightarrow 1 - \binom{n}{0} \cdot 0.0005^0 \cdot 0.9995^n = 0.5$$

$$\Leftrightarrow 1 - 0.9995^n = 0.5$$

$$\Leftrightarrow 1 - 0.5 = 0.9995^n$$

$$\Leftrightarrow 0.5 = 0.9995^n$$

$$\Leftrightarrow \lg 0.5 = n \cdot \lg 0.9995$$

$$\Leftrightarrow n = \frac{\lg 0.5}{\lg 0.9995} \hat{=} 1385.94$$

1386 mal wiederholen!

d)  $\mu = 800 \text{ mm}$        $\sigma = 5 \text{ mm}$        $5\% \hat{=} 0.5$

$$P(800-t \leq X \leq 800+t) = 0.95$$

$$\text{Normieren: } \Phi\left(\frac{800+t-800}{6}\right) - \Phi\left(\frac{800-t-800}{6}\right) = 0.95$$

$$\Leftrightarrow \Phi\left(\frac{t}{6}\right) - \Phi\left(-\frac{t}{6}\right) = 0.95$$

$$\Leftrightarrow \Phi\left(\frac{t}{6}\right) - \left(1 - \Phi\left(\frac{t}{6}\right)\right) = 0.95$$

$$\Leftrightarrow 2\Phi\left(\frac{t}{6}\right) = 1.95$$

$$\Leftrightarrow \Phi\left(\frac{t}{6}\right) = 0.975$$

$$\text{Tabelle: } \Phi(1.96) = 0.975$$

$$\text{daher: } \frac{t}{6} = 1.96$$

$$\Rightarrow t = 9.8$$

Also: Intervall:

$$[790.2; 809.8]$$