Aufgabe 7

a) Median $\frac{x_{25}+x_{26}}{2} = \frac{3,25+3.26}{2} = 3,255$

unteres Quartil: $n \cdot p = 50 \cdot 0.25 = 12.5$

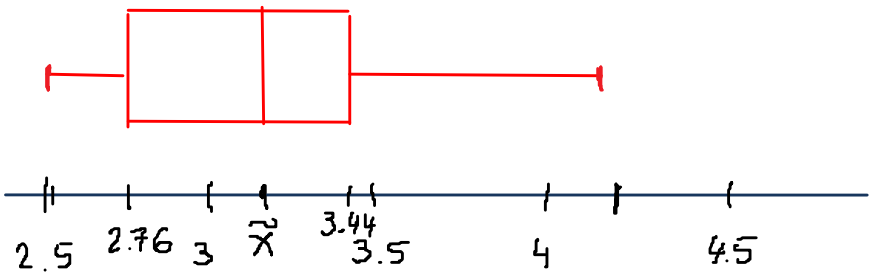
$\Rightarrow x_{13} = 2.76$

oberes Quartil: $n \cdot p = 50 \cdot 0.75 = 37.5$

$\Rightarrow x_{38} = 3.44$

Min: 2.53

Max: 4.20



b) $p = \frac{10}{50} = \frac{1}{5}$ $n = 5$ Binomialverteilung

$P(X \geq 2) = 1 - P(X < 2)$

$= 1 - [P(X=0) + P(X=1)]$

$= 1 - \left[\binom{5}{0} \cdot \frac{1}{5}^0 \cdot \frac{4}{5}^5 + \binom{5}{1} \cdot \frac{1}{5}^1 \cdot \frac{4}{5}^4\right]$

$$= 1 - \left[1 \cdot 1 \cdot 0{,}32768 + 5 \cdot 0.2 \cdot 0.4096 \right]$$

$$= 1 - 0.32768 - 0.4096$$

$$\approx 0.26272$$

c) $P(X > 58{,}8) = 0{,}33$

$$P(X > 58.8) = 1 - P(X < 58.8) = 0.33$$

$$\Rightarrow P(X < 58.8) = 1 - 0.33 = 0.67$$

$$\Phi\left(\frac{X-\mu}{\sigma}\right) = 0.67$$

Tabelle "rückwärts":

$$\frac{X-\mu}{\sigma} = 0.44$$

$X = 58.8 \quad \mu = 50$

$$\frac{58.8 - 50}{\sigma} = 0.44\sigma$$

$$\Leftrightarrow \quad 8.8 = 0{,}44\sigma$$

$$\Leftrightarrow \quad \sigma = 20$$