

## 1. Allgemeine Form

$$n = 10, p = 0.2$$

$$P(X = 3) = B_{10;0.2}(3)$$

$$P(X \leq 3) = F_{10;0.2}(3)$$

$$P(X > 1) = F_{10;0.2}(10) - F_{10;0.2}(3)$$

$$P(5 \leq x \leq 8) = F_{10;0.2}(8) - F_{10;0.2}(4)$$

## 2. S. 289 Nr. 3

a)

$$B_{20;0.5}(10) \approx 20\%$$

$$B_{20;0.5}(11) \approx 15\%$$

$$B_{20;0.8}(15) \approx 20\%$$

$$F_{20;0.5}(10) \approx 50\%$$

$$F_{20;0.5}(11) \approx 70\%$$

$$F_{20;0.8}(15) \approx 30\%$$

## 3. S. 289 Nr. 5

Erwartungswert  $n = 10 \wedge p = 0.6$  :

$$\mu = n \cdot p$$

$$\mu = 10 \cdot 0.6$$

$$\mu = 6$$

Standardabweichung  $n = 10 \wedge p = 0.6$  :

$$\sigma = \sqrt{n \cdot p \cdot (1 - p)}$$

$$\sigma = \sqrt{10 \cdot 0.6 \cdot 0.4}$$

$$\sigma = \sqrt{2.4}$$

$$\sigma \approx 1.549$$

$2\sigma$ -Intervall :

$$P(\mu - 2\sigma \leq X \leq \mu + 2\sigma)$$

$$\Rightarrow P(6 - 2 \cdot \sqrt{2.4} \leq X \leq 6 + 2 \cdot \sqrt{2.4})$$

$$\Rightarrow P(2.9 \leq X \leq 9.09)$$

$$\Rightarrow P(3 \leq X < 9)$$

$$\Rightarrow P(3 \leq X < 9) \approx 98.165\%$$

**Erwartungswert**  $n = 20 \wedge p = 0.6$  :

$$\begin{aligned}\mu &= n \cdot p \\ \mu &= 20 \cdot 0.6 \\ \mu &= 12\end{aligned}$$

**Standardabweichung**  $n = 20 \wedge p = 0.6$  :

$$\begin{aligned}\sigma &= \sqrt{n \cdot p \cdot (1 - p)} \\ \sigma &= \sqrt{20 \cdot 0.6 \cdot 0.4} \\ \sigma &= \sqrt{4.8} \\ \sigma &\approx 2.19\end{aligned}$$

**2 $\sigma$ -Intervall** :

$$\begin{aligned}P(\mu - 2\sigma \leq X \leq \mu + 2\sigma) \\ \Rightarrow P(12 - 2 \cdot \sqrt{4.8} \leq X \leq 12 + 2 \cdot \sqrt{4.8}) \\ \Rightarrow P(7.618 \leq X \leq 16.38) \\ \Rightarrow P(7 < X < 17) \\ \Rightarrow P(7 < X < 17) \approx 98.99\%\end{aligned}$$

#### 4. S. 289 Nr. 6

a)