

FACIT (Dugga 20091103)

$$\textcircled{1} E[X] = -1 \cdot \frac{1}{5} + 1 \cdot \frac{2}{5} = \frac{2}{5} - \frac{1}{5} = \underline{\underline{\frac{1}{5}}}$$

$$\textcircled{2} V(X) = E[X^2] - E[X]^2 = 4 - 1^2 = \underline{\underline{3}}$$

$$\textcircled{3} P(A \cap B) = P(A)P(B) = 0.3 \cdot 0.9 = \underline{\underline{0.27}}$$

$$\textcircled{4} \textcircled{a} P(E) = 0.6 ; P(K) = 0.5 \quad P(E \cup K) = 1$$

$$\textcircled{a} P(E \cup K) = P(E) + P(K) - \underline{P(E \cap K)}$$

$$\Rightarrow P(E \cap K) = P(E) + P(K) - P(E \cup K) = 0.5 + 0.6 - 1 = \underline{\underline{0.1}}$$

$$\textcircled{b} P(E|K) = \frac{P(E \cap K)}{P(K)} = \frac{0.1}{0.5} = \underline{\underline{0.2}}$$

$$\textcircled{5} X \sim \text{Bin}(n, p) \quad n=3, \quad p=\frac{1}{5}$$

$$P_X(2) + P_X(1) = \binom{3}{2} \left(\frac{1}{5}\right)^2 \frac{4}{5} + \binom{3}{1} \left(\frac{1}{5}\right)^3 =$$

$$= \frac{3 \cdot 2 \cdot 1}{2 \cdot 1 \cdot 1} \frac{4}{125} + \frac{1}{125} = \underline{\underline{\frac{13}{125}}}$$

Tabell: $1 - F_X(2) = 1 - 0.8960 = \underline{\underline{0.1040}} = \frac{13}{125}$ ~~125~~

$$\textcircled{6} E[Z] = E\left[\frac{X-\mu}{\sigma}\right] = \frac{1}{\sigma} (E[X] - \mu) = \underline{\underline{0}}$$

$$\textcircled{7} V(Z) = \frac{1}{\sigma^2} V(X) = \frac{3^2}{3^2} = \underline{\underline{1}}$$

$$\textcircled{7} X \sim \text{Geo}(p=0.2) \text{ sa}$$

$$P(X=3) = (1-p)^2 \cdot p = \left(\frac{4}{5}\right)^2 \cdot \frac{1}{5} = \underline{\underline{\frac{16}{125}}}$$

$$= 0.1280$$