Stochastik-Aufgaben: Wahrscheinlichkeit 4

① $P(A) = 50/100$, $P(B) = 33/100$, $P(C) = 25/100$

a) $\underline{\underline{P_A(B)}} = \frac{P(A \cap B)}{P(A)} = \frac{16/100}{50/100} = \underline{\underline{\frac{16}{50}}}$, $|A \cap B| = 16$

b) $\underline{\underline{P_B(A)}} = \frac{P(B \cap A)}{P(B)} = \frac{16/100}{33/100} = \underline{\underline{\frac{16}{33}}}$

c) $\underline{\underline{P_A(C)}} = \frac{P(A \cap C)}{P(A)} = \frac{25/100}{50/100} = \underline{\underline{1/2}}$, $|A \cap C| = |C|$

d $\underline{\underline{P_C(A)}} = \frac{P(C \cap A)}{P(C)} = \frac{25/100}{25/100} = \underline{\underline{1}}$

② "Augensumme = 7": $1/6$

"Augensumme ungerade": $1/2$

"Augensumme prim": $15/36$

"Augensumme gerade": $1/2$

$\Rightarrow$

a) $\underline{\underline{P_u(7)}} = \frac{P(u \cap 7)}{P(u)} = \frac{1/6}{1/2} = \underline{\underline{\frac{1}{3}}}$ $(u \cap 7 = 7)$

b) $\underline{\underline{P_p(7)}} = \frac{P(p \cap 7)}{P(p)} = \frac{1/6}{15/36} = \underline{\underline{\frac{2}{5}}}$ $(p \cap 7 = 7)$

c) $\underline{\underline{P_g(7)}} = \frac{P(g \cap 7)}{P(g)} = \underline{\underline{0}}$ $(g \cap 7 = \{\})$

③ $A :=$ Augensumme ist 9, 10 oder 11.

$B_i :=$ Der 1. Wurf zeigt i Augen $(i = 1, \dots, 6)$, $P(B_i) = 1/6$.

i	$A \cap B_i$	$P(A \cap B_i)$	$P_{B_i}(A)$
1	$\{\}$	0	$\underline{\underline{0}}$
2	$\{\}$	0	$\underline{\underline{0}}$
3	$\{(3/6)\}$	$1/36$	$\frac{1/36}{1/6} = \underline{\underline{\frac{1}{6}}}$
4	$\{(4/5),(4,6)\}$	$2/36$	$\frac{2/36}{1/6} = \underline{\underline{\frac{1}{3}}}$
5	$\{(5/4),(5/5)/(5/6)\}$	$3/36$	$\frac{3/36}{1/6} = \underline{\underline{\frac{1}{2}}}$
6	$\{(6/3),(6/4),(6,5),\}$	$3/36$	$\frac{3/36}{1/6} = \underline{\underline{\frac{1}{2}}}$

(4) "F = Fehlerstand" $|\Omega| = 64.2$ Mio

"H = ♂"

Bekannte Größen: $P(H) = \frac{25.2}{64.2}$, $P_H(F) = 0.08$, $P_{\bar{H}}(F) = 0.006$

a) $\underline{P(H \cap F)} = P_H(F) \cdot P(H) = \underline{\underline{0.038}}$ $(= 3.817\%)$

b) $\underline{P(\bar{H} \cap F)} = P_{\bar{H}}(F) \cdot P(\bar{H}) = \underline{\underline{0.003}}$ $(= 0.314\%)$

c) $\underline{P(F)} = P_H(F) \cdot P(H) + P_{\bar{H}}(F) \cdot P(\bar{H}) = \underline{\underline{0.041}}$ (4.131%)

(5) R_i = Sprecher aus der R3Teilung i, mit $i = 1, 2$

F = f - Sprecher

$$P(F) = P_{R_1}(F) \cdot P(R_1) + P_{R_2}(F) \cdot P(R_2)$$

$$= \frac{5}{20} \cdot \frac{1}{2} + \frac{4}{12} \cdot \frac{1}{2} = \frac{7}{24} = \underline{\underline{0.292}}$$