Homework

Exercises 5–10 Bergner Bjo-02

5) 6 numbers out of 49

a) 3 of 6 winning numbers

$$\frac{C_3^6 \cdot C_3^{43}}{C_6^{49}} = \frac{\frac{6!}{3!3!} \cdot \frac{43!}{40!3!}}{\frac{49!}{6! \cdot 43!}} = \frac{20 \cdot 12,341}{13,983,816} \approx 0,0177$$

b) $$\frac{C_6^6 \cdot C_0^{43}}{C_6^{49}} = \frac{6! \cdot 43!}{49!}$$

6) $P = \frac{4}{32} + \frac{12}{32} = \frac{16}{32} = 0,5$

7) $P(A \cap B \cap C \cap D) = 0,5^4 = \frac{1}{2^4} = \frac{1}{16} = 0,0625$

8) $P = C_5^3 \cdot 0,51^3 \cdot 0,49^2 = \frac{5!}{3!2!} \cdot 0,51^3 \cdot 0,49^2 = 0,318$

9) $A = \frac{37930}{100.000}$ $B = \frac{82170}{100.000}$ ~~$P(A|B)$~~ ?

~~$P(B|A)$~~ ?

~~$P(A|B)$~~ ~~$P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{37930}{100000}$~~

$P(A|B)$ – ?

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{37930}{100.000} \cdot \frac{100.000}{82170} \approx 0,462$$

11) $P(H) = \frac{2}{3}$ $P(\bar{H}) = \frac{1}{3}$

$$P = C_4^4 \cdot \left(\frac{2}{3}\right)^4 \cdot \left(\frac{1}{3}\right)^3 = \frac{4!}{4!3!} \cdot \left(\frac{2}{3}\right)^4 \cdot \left(\frac{1}{3}\right)^3 \approx 0,256$$