

**Lösungen zur Klausur vom 2. September 2015**

Disclaimer: Schreibfehler sind nicht auszuschließen.

**A1:** A.  $4 \cdot 4 \cdot 9^3 = \underline{\underline{11\,664}}$ .

**A2:** A.  $(3/10)(5/9)(2/8) = \underline{\underline{0.04167}}$ .

**A3:** C.  $(3 \cdot 9 \cdot 8)/(10 \cdot 9 \cdot 8) = \underline{\underline{0.3}}$ .

**A4:** D. Venndiagramme zeichnen ...

**A5:** B.  $P(W) = 0.6$ ,  $P(B) = 0.4$ ,  $P(W \cap B) = 0.25$ .  $P(B \setminus W) = 0.4 - 0.25 = \underline{\underline{0.15}}$ .

**A6:** D.  $P(W \cup B) = 0.6 + 0.4 - 0.25 = \underline{\underline{0.75}}$ .

**A7:** C.  $P(A \cap B) = 0 \neq P(A)P(B)$ .

**A8:** B.  $0.95 \cdot 0.9^2 + 0.05 \cdot 0.9^2 + 0.95 \cdot 0.1 \cdot 0.9 \cdot 2 = \underline{\underline{0.981}}$ .

**A9:** D.  $0.7 - 0.5 = \underline{\underline{0.2}}$ .

**A10:** A.  $E(X) = \underline{\underline{5}}$ .

**A11:** A.  $Var(X) = \underline{\underline{12}}$ .

**A12:** A.  $q_{0.4} = \underline{\underline{2}}$ .

**A13:** C.  $\int_{0.5}^3 f(x)dx = \underline{\underline{0.7523}}$ .

**A14:** B.  $\int_0^3 x \cdot f(x)dx = \underline{\underline{1.125}}$ .

**A15:** C.  $E(X^2) = \int_0^3 x^2 \cdot f(x)dx = 1.8$ .  $Var(X) = \underline{\underline{0.5344}}$ .

**A16:** D.  $Y = 3 - X \geq 2$  g.d.w.  $X \leq 1$ .

**A17:** B.  $Y = 3 - X$ .

**A18:** A.

**A19:** C.  $T_X = [2, 3]$ .

**A20:** A.  $B = Y + X_1 + X_2 + X_3$ ,  $E(B) = 5 + 3 \cdot 8 = \underline{\underline{29}}$ .

**A21:** C.  $Var(B) = 0.2^2 + 3 \cdot 0.5^2 = 0.79$ ,  $\sigma_B = \sqrt{0.79} \approx \underline{\underline{0.89}}$ .

**A22:** A.  $0 \leq Var(X^2) = E(X^4) - (E(X^2))^2$ .

**A23:** D.  $X \sim B(10, 0.6)$ ,  $P(X = 8) = \underline{\underline{0.1209}}$ .

**A24:** A.  $P(Y \geq 0) = 1 - e^{-2} \approx \underline{\underline{0.8647}}$ .

**A25:** A.  $\Phi((4-3)/1.5) - \Phi((1-3)/1.5) \approx \underline{\underline{0.6568}}$ .

**A26:** D.  $3 + 1.5 \cdot 1.28 = \underline{\underline{4.92}}$ .

- A27:** D. 1.96.
- A28:** A. 3.62.
- A29:** B.  $P(X = 0, Y = 0) \neq P(X = 0)P(Y = 0)$ .
- A30:** C. Einzelwahrscheinlichkeiten vergleichen.
- A31:** C.  $E(X|Y = 0) = \underline{0.3898}$ .
- A32:** D.  $E(X_i) = 0.5$ ,  $P(|0.5| > 0.001) = 1$ .
- A33:** B.  $Var(X_i) \approx 2.083$ ,  $E(X_i^2) \approx \underline{2.333}$ .
- A34:** C.  $P(S > 263) \approx 1 - \Phi((263 - 250)/\sqrt{100}) \approx \underline{0.0968}$ .
- A35:** B.
- A36:** C.
- A37:** B.  $\mu = E(X_i) = 2\theta + 0.6$ ,  $\theta = 0.5\mu - 0.3$ .
- A38:** D.  $s_X^2 = \underline{0.16675}$ .
- A39:** D.  $2.82 + 4.6041\sqrt{0.1668/5} \approx \underline{3.661}$ .
- A40:** A.  $0.55 + 1.96 \cdot \sqrt{0.55 \cdot 0.45/200} \approx \underline{0.6189}$ .
- A41:** B.  $2 = 2z_{1-\alpha/2} \cdot 5/12$ ,  $\alpha \approx \underline{0.0164}$ .
- A42:** A.
- A43:** B.  $\hat{\alpha} = 20/400 = \underline{0.05}$ .
- A44:** C.  $\hat{\beta} = 1 - 120/400 = \underline{0.7}$ .
- A45:** D. 0.0707.
- A46:** A.  $t_{24,0.95} = \underline{1.7109}$ .
- A47:** B.
- A48:** C.
- A49:** B.  $t = (59 - 200 \cdot 0.25)/\sqrt{200 \cdot 0.25 \cdot 0.75} \approx \underline{1.47}$ .
- A50:** B.  $t \not> 1.64$ .
- A51:** B.
- A52:** B.  $(0.2 - 0.1)/\sqrt{0.2 \cdot 0.8/100 + 0.1 \cdot 0.9/100} = \underline{2}$ .
- A53:** B.  $t > 1.64$ .
- A54:** D.  $\chi^2 = 18^2(1/60 + 1/30 + 1/40 + 1/20) = \underline{40.5}$ .
- A55:** A.  $q_{1,0.95} \approx \underline{3.8415}$ .

**A56:** A.  $s_X^2 = 2.5$ ,  $s_Y^2 = 12.7$ ,  $s_{XY} = 4.5$ ,  $r \approx \underline{\underline{0.799}}$ .

**A57:** D.  $(7.6 - 5)/0.5033 \approx \underline{\underline{5.166}}$ .

**A58:** C.  $t_{3,0.95} = \underline{\underline{2.3534}}$ .

**A59:** C.  $8.6 + 6 \cdot 7.60 = \underline{\underline{54.2}}$ .

**A60:** C.  $0.5033 \cdot \sqrt{55 - 5 \cdot 3^2} \approx \underline{\underline{1.5916}}$ .