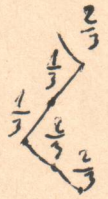
Übungszettel 5

1) a) i)



$\left(\frac{1}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^3 = 0{,}033 = \underline{3{,}3\%}$

ii) $\overline{P} = \left(\frac{2}{3}\right)^5$, $P = 1 - \overline{P} = 0{,}868 = \underline{86{,}8\%}$

iii) $P(X=3) = \binom{5}{3}\left(\frac{1}{3}\right)^3 \cdot \left(\frac{2}{3}\right)^2 = 10 \cdot 0{,}0165 = 0{,}165$

$P(X=4) = \binom{5}{4}\left(\frac{1}{3}\right)^4 \cdot \left(\frac{2}{3}\right)^1 = 5 \cdot 0{,}0082 = 0{,}041$

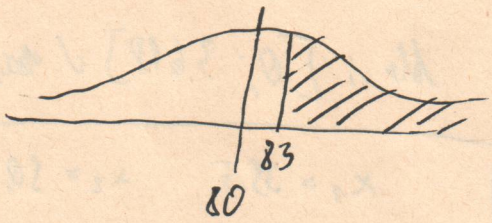
$P(X=5) = \binom{5}{5}\left(\frac{1}{3}\right)^5 \cdot \left(\frac{2}{3}\right)^0 = 0{,}004$

$0{,}210 = \underline{21\%}$

b) • Wahrsch., eine Lösung. Frage falsch und den Rest ri
• Wahrsch. eine Frage f.
• zwei

c) $p = 0{,}8$ $q = 0{,}2$ $\sigma = 4$ $\mu = 80$

i) Annahme: $[83; 100]$



$x_1 = 82{,}5$ $x_2 = 100{,}5$

$z_1 = 0{,}625$ $z_2 = 5{,}125$

$\Phi(z_1) = \Phi(0{,}62) = 0{,}73237$ $\Phi(0{,}625) = 0{,}73401$
$\Phi(0{,}63) = 0{,}73565$

$\Phi(z_2) = 1$

$P(83 \leq X \leq 100) = 0{,}266 = \underline{26{,}6\%}$

ii) $P(70 \leq X \leq 82)$ $x_1 = 69{,}5$ $x_2 = 82{,}5$ $z_1 = -2{,}625$ $z_2 = 0{,}625$

$\Phi(0{,}625) = 0{,}73401$ $\Phi(2{,}62) = 0{,}9956$ $\Phi(2{,}63) = 0{,}99573$ $\Phi(2{,}625) = 0{,}995665$

$1 - \Phi(2{,}625) = 0{,}004$ $P = 0{,}730 = 73{,}0\%$

Übungszettel 6

37% aller Frauen Raucherinnen

bei 1000 398

$n = 1000 \quad p = 0{,}37 \quad q = 0{,}63$

$\mu = 370 \quad \sigma = 15{,}27$

$2\Phi(z) - 1 = 0{,}95$

$\Phi(z) = 0{,}975 \quad z = 1{,}96$

$\varepsilon = z \cdot \sigma = 1{,}96 \cdot 15{,}27 = 29{,}9$

$x_1 = 340{,}1 \quad x_2 = 399{,}9$

Ml.: $[0; 340] \cup [400; 1000]$

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10 000 3 980

$n = 10000 \quad \mu = 3700 \quad \sigma = 48{,}28$

$\varepsilon = 1{,}96 \cdot 48{,}28 = 81{,}6$

$x_1 = 3618{,}4 \quad x_2 = 3781{,}5$

Ml.: $[0; 3618] \cup [3782; 10000]$

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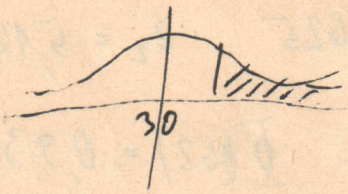
484) $x_1 = 39{,}5 \quad x_2 = 40{,}5$

$z_1 = 2{,}12$



Übungszettel 7