3.1)

a) $a^* = s_{xy} / s_x^2$ $\quad b^* = \bar{y} - a^* \cdot \bar{x}$

$\bar{x} = \frac{-1+0+2+3}{4} = 1$ $\quad \bar{y} = \frac{1-2+2+6}{4} = 1,75$

$s_x^2 = \frac{1}{4} \cdot [(-1-1)^2 + (0-1)^2 + (2-1)^2 + (3-1)^2] = 2,5$

$s_{xy} = \frac{1}{4} \cdot [[(-1-1) \cdot (1-1,75)] + [(0-1) \cdot (-2-1,75)] +$
$[(2-1,[redacted]) \cdot (2-1,75)] + [(3-1) \cdot (6-1,75)]]$

$s_{xy} = 3,75$

$a^* = \frac{3,75}{2,5} = 1,5$ $\quad b^* = 1,75 - 1,5 \cdot 1 = 0,25$

$M_{1,5;0,25}(x) = 1,5x + 0,25$

~~b) $a^* = 1$ $b^* = 1,75 - 1 = 0,75$~~

~~$M_{1;0,75}(x) = x + 0,75$~~

3.11

b) ~~$f(a,b) = \sum_{i=1}^{4} (a + bx_i + y_i)^2$~~

$$\text{I}: a \cdot \sum_i x_i^2 + b \cdot \sum_i x_i - \sum_i x_i y_i = 0$$

$$\text{II}: a \cdot \sum_i x_i + b \cdot \sum_i 1 - \sum_i y_i = 0$$

$$\text{I}: 14a + 4b - 21 = 0 \quad \text{(LGS)}$$

$$\text{II}: 4a + 4b - 7 = 0$$

$$\Rightarrow a^* = 1{,}4$$
$$b^* = 0{,}35$$

$$\mu_{1.4;0.35}(x) = 1{,}4x + 0{,}35$$

$$a^* = 1 \Rightarrow b^* = 1{,}75$$

c)

3.3) a) $\Omega = \{C, V, N, S\}$ $\#\Omega = 4$ $\#\Sigma = 4^1 + 4^2 + 4^3 = 84$

b) A = Mindestens eine Schlumpf-Kugel

$P(A) = (1 + 3 + 6) / 84 \approx 11{,}9\%$

c) B = Becher mit 3 Kugeln

~~$P(A \wedge B) = \text{[illegible]}$~~ $P(A) \cdot P(B) = 11{,}9\%$.

$P(B|A) = \frac{P(A \wedge B)}{P(A)} = \frac{6/84}{0{,}119} = 0{,}6 = 60\%$