$$P(B_{21} \mid E) = \frac{0.0075}{0.0975} = \frac{1}{13} \approx 0{,}077$$

Ab hier nur für ALTE POs:

3) i) $R^2 = 1 \iff y_i = \hat{m} x_i + \hat{b}$ für alle $i = 1, 2, \dots, n$, $\underline{\underline{\hat{m} \neq 0}}$

$\Rightarrow y_5 - y_2 = \hat{m} x_5 + \hat{b} - (\hat{m} x_2 + \hat{b}) = \hat{m}(x_5 - x_2)$

$\Rightarrow \hat{m} = \frac{y_5 - y_2}{x_5 - x_2} = \frac{2-1}{7-3} = \frac{1}{4} \Rightarrow \hat{b} = y_2 - \hat{m} x_2 = 1 - \frac{1}{4} \cdot 3 = \frac{1}{4}$

ODER $\hat{b} = y_5 - \hat{m} x_5 = 2 - \frac{1}{4} \cdot 7 = \frac{1}{4}$

($\hat{y} = \frac{1}{4} x + \frac{1}{4}$ ist Regressionsgerade von Y bzgl. X)

ii) $0 = R^2 = r_{xy}^2$ und $r_{xy} := \frac{s_{xy}}{s_x s_y} \Rightarrow s_{xy} = 0 \Rightarrow$

$0 = (n-1) s_{xy} = \sum_{i=1}^{5} x_i y_i - 5 \cdot \bar{x} \cdot \bar{y} \overset{(*)}{=} 4 y_1 + 6 \cdot 4 + 7 \cdot 5 + 5 \cdot 9 + 8 \cdot 10 -$

$- 5 \cdot 6 \cdot \frac{y_1 + 28}{5} = 4 y_1 + 184 - 168 - 6 y_1 = 16 - 2 y_1 \Rightarrow y_1 = \frac{16}{2} = \underline{\underline{8}}$

$(*)$ $\bar{x} = \frac{4+6+7+5+8}{5} = 6$, $\bar{y} = \frac{y_1 + 4 + 5 + 9 + 10}{5} = \frac{y_1 + 28}{5}$

iii) $$r_{xy}^{\text{Rang}} = 1 - \frac{6 \cdot \sum_{i=1}^{n} (R_i - R_i')^2}{n \cdot (n^2 - 1)} = 1 - \frac{6\left[(4-4)^2 + (6-1)^2 + (2-5)^2 + (5-2)^2 + (1-6)^2 + (3-3)^2\right]}{6 \cdot (6^2 - 1)}$$

$$= 1 - \frac{68}{35} = -\frac{33}{35} \approx -0.94$$

Es gilt: $R_i = x_i$ und $R_i' = y_i \Rightarrow r_{xy}^{\text{Rang}} := r_{RR'} = r_{xy}$

$\Rightarrow R^2 = r_{xy}^2 = (r_{xy}^{\text{Rang}})^2 = (-\frac{33}{35})^2 \approx 0.89$