

$$S_x^2 = \frac{(-5)^2 + 0^2 + 5^2}{3} = \frac{50}{3} = 16,67 \rightarrow S_x = \sqrt{16,67} = 4,082$$

2

$$S_y^2 = \frac{2^2 + 0^2 + (-2)^2}{3} = \frac{8}{3} = 2,67 \rightarrow S_y = \sqrt{2,67} = 1,634$$

$$\beta = \frac{\sum (x - \bar{x}) \cdot (y - \bar{y})}{\sum (x - \bar{x})^2}$$

$$= \frac{(-5) \cdot 2 + 0 \cdot 0 + 5 \cdot (-2)}{(-5)^2 + 0^2 + 5^2} = \frac{-10 - 10}{50} = \frac{-20}{50} = -0,4$$

$$\hat{y} = \alpha - 0,4x \rightarrow \alpha = \hat{y} + 0,4x$$
$$\alpha = \bar{y} + 0,4\bar{x}$$
$$\alpha = 3 + 0,4 \cdot 5$$
$$\alpha = 5$$

$$r = \beta \frac{S_x}{S_y}$$

$$= 0,4 \frac{4,082}{1,634} = 0,4 \cdot 2,5 = 1$$

9.7

x = PIL pro capite

y = emissioni CO₂

$$\hat{y} = 1,26 + 0,346x$$

$$a) \text{ i) } x = 0,8 \rightarrow \hat{y} = 1,26 + 0,346 \cdot 0,8 = 1,54$$

$$\text{ii) } x = 34,3 \rightarrow \hat{y} = 1,26 + 0,346 \cdot 34,3 = 13,13$$

$$b) x = 34,3 \quad y = 19,7$$

$$E_1 = y - \hat{y}$$
$$= 19,7 - 13,13 = 6,57$$