

Assignment 6

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May 25, 2022

Outline

1 Question

2 Solution

Question

(a) Show that if $y=ax+b$, then $\sigma_y = |a|\sigma_x$. (b) Find η , and σ , if $y = \frac{x-\eta_x}{\sigma_x}$

Solution

(a)

$$\eta_y = a\eta_x + b \quad (1)$$

$$\sigma_y^2 = E([ax + b - (a\eta_x + b)]^2) \quad (2)$$

$$\sigma_y^2 = E(a^2(x - \eta_x)^2) = a^2\sigma_x^2 \quad (3)$$

$$\sigma_y = |a|\sigma_x \quad (4)$$

(b)

$$y = \frac{x - \eta_x}{\sigma_x} \quad (5)$$

$$E(y) = 0 \quad (6)$$

$$\sigma_y^2 = \frac{\sigma_x^2}{\sigma_x^2} = 1 \quad (7)$$