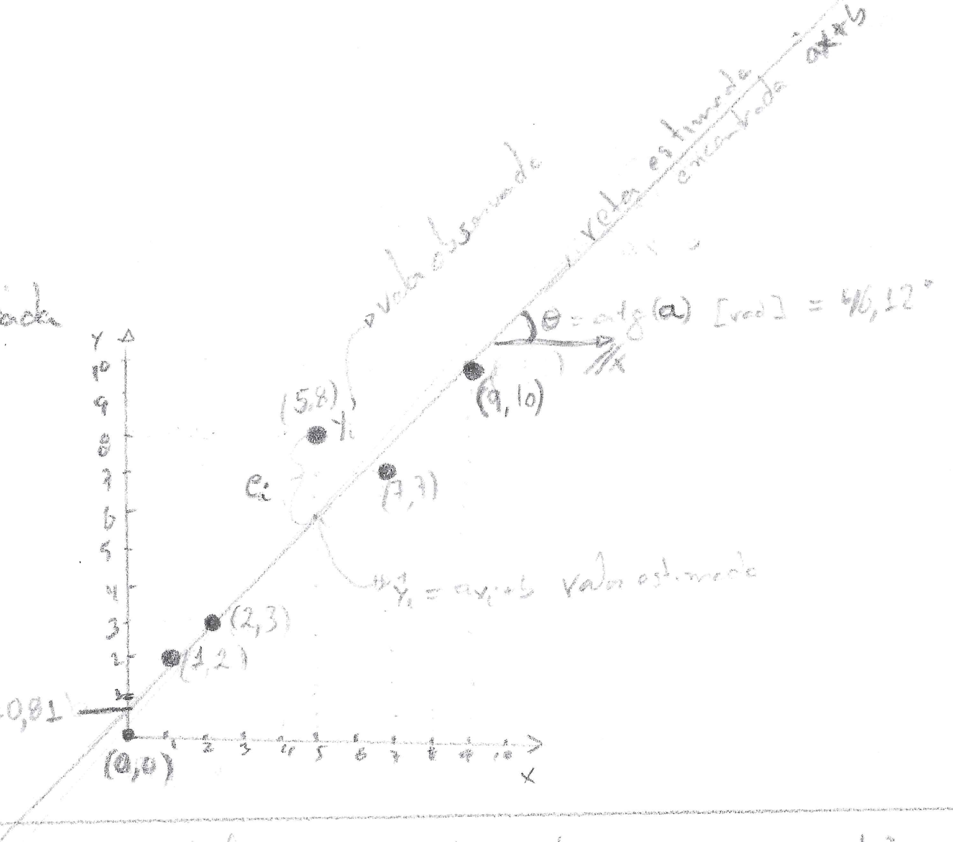
Q1

c)

a reta encontrada visa diminuir o erro de estimação no sentido do erro quadrático médio, e o faz de modo ótimo



a) e_i = erro, diferença entre observado e estimado

$$EQM \triangleq \frac{1}{n}\sum_i^n e_i^2 = \frac{1}{n}\sum_i^n \left(Y_{observado} - \hat{Y}\right)^2 = \frac{1}{n}\sum_i^n \left(Y_i - (ax_i + b)\right)^2$$

Por mínimos Quadrados (Técnica q garante o menor EQM)

b) $\bar{x} = \frac{1}{n}\sum_i^n x_i$; $\bar{Y} = \frac{1}{n}\sum_i^n Y_i$

$$S_{xx} = \sum_i^n (x_i - \bar{x})^2 = \sum_i^n (x_i - \bar{x})x_i = \sum_i^n x_i^2 - n\bar{x}^2$$

$$S_{xy} = \sum_i^n x_i y_i - n\bar{x}\bar{y}$$

Calc

$$a = \frac{S_{xy}}{S_{xx}} \qquad b = \bar{y} - a\bar{x}$$

$\rightarrow \bar{x} = (0+1+2+5+7+9)/6 = 4$

$\bar{y} = (0+2+3+8+7+10)/6 = 5$

$S_{xy} = 0.0 + 1.2 + 2.3 + 5.8 + 7.7 + 9.10 - 6.4.5 =$

$= 2 + 6 + 40 + 49 + 90 - 120 = 67$

$S_{xx} = 0.0 + 1.1 + 2.2 + 5.5 + 7.7 + 9.9 - 6.4^2 =$

$= 0 + 1 + 4 + 25 + 49 + 81 - 96 = 64$

$a = \frac{67}{64}$ $\qquad b = 5 - \frac{67}{64}.4$

$\boxed{a = 1{,}046875}$ $\boxed{b = 0{,}8125}$

do item a)

$$EQM = \frac{1}{n}\sum_i^n \left(Y_i - (ax_i + b)\right)^2 \Rightarrow \frac{1}{n}\left(\bar{Y} - \hat{\bar{Y}}\right)^2 = \frac{1}{6}\left([0\ 2\ 3\ 8\ 7\ 10] - [0{,}81\ 1{,}86\ 2{,}91\ 6{,}05\ 8{,}14\ 10{,}23]\right)^2$$

EQM = 0,98