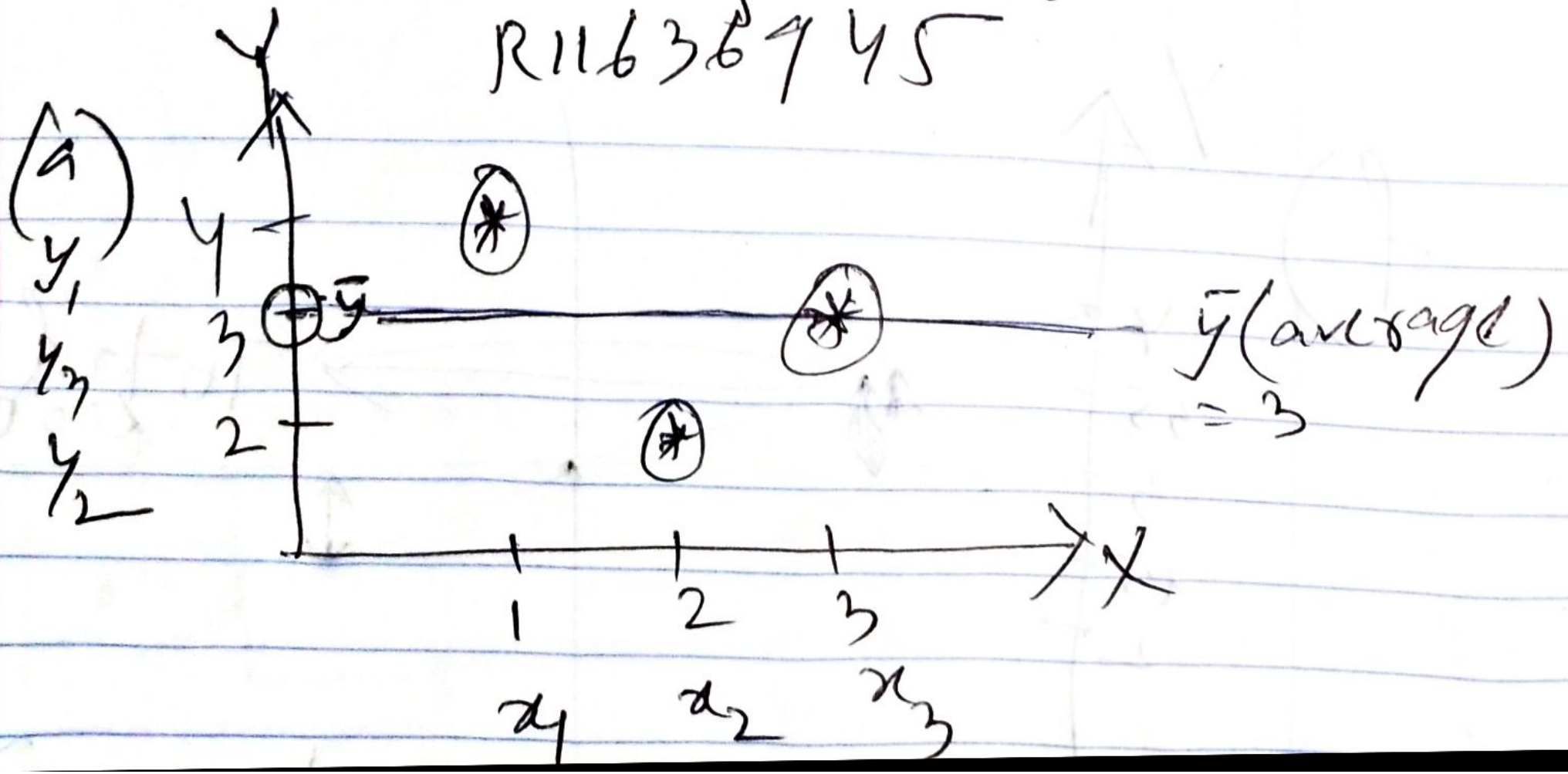
Md Ariful Haque Miah
R1163645

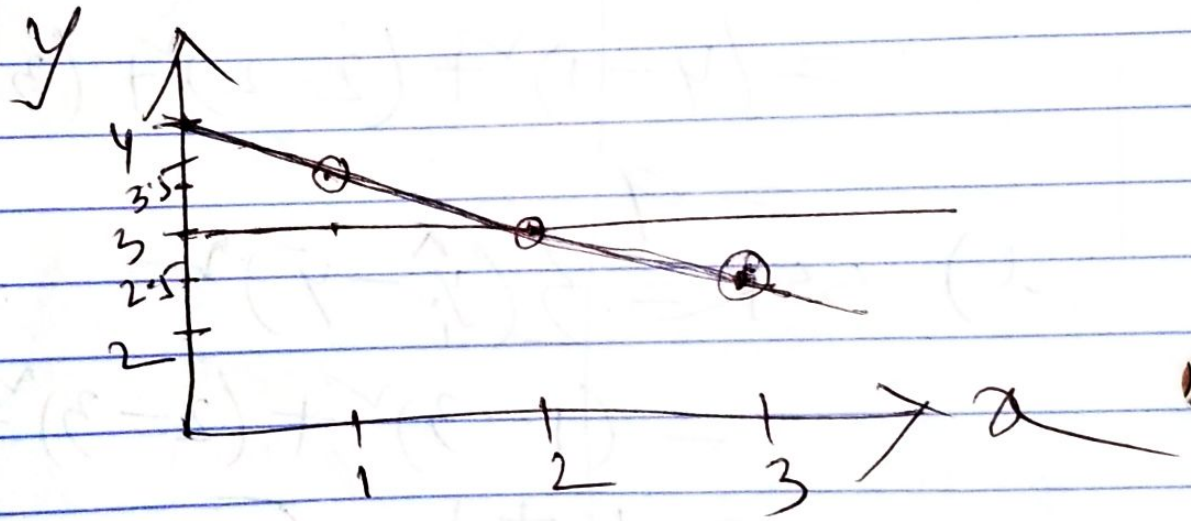


(b) $y = -\frac{1}{2}x + 4$

$4 \cdot \frac{3}{2}$

$= \frac{8-3}{2}$

x	y
1	3.5
2	3
3	2.5



b_0 = intercept $= \bar{y} - b_1\bar{x} = 3 - 2b_1 = 4$

~~$= 4$~~

$$b_1 = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sum (x_i - \bar{x})^2}$$

$$= \frac{(1-2)(4-3) + (2-2)(2-3) + (3-2)(3-3)}{(1-2)^2 + (2-2)^2 + (3-2)^2}$$

$= -1/2 =$ Slope

$y = f(x) = mx + b = -x/2 + 4$

(c) $SST = \sum (y_i - \bar{y})^2$

$= (4-3)^2 + (2-3)^2 + (3-3)^2$

$= 1 + 1 = 2$

(d) $SSE = \sum (y_i - \hat{y}_i)^2$

$= (4-3.5)^2 + (2-3)^2 + (3-2.5)^2$

$= 0.25 + 1 + 0.25$

$= 1.5$

(e) $SSR = \sum (\hat{y}_i - \bar{y})^2$

$= (3.5-3)^2 + (3-3)^2 + (2.5-3)^2$

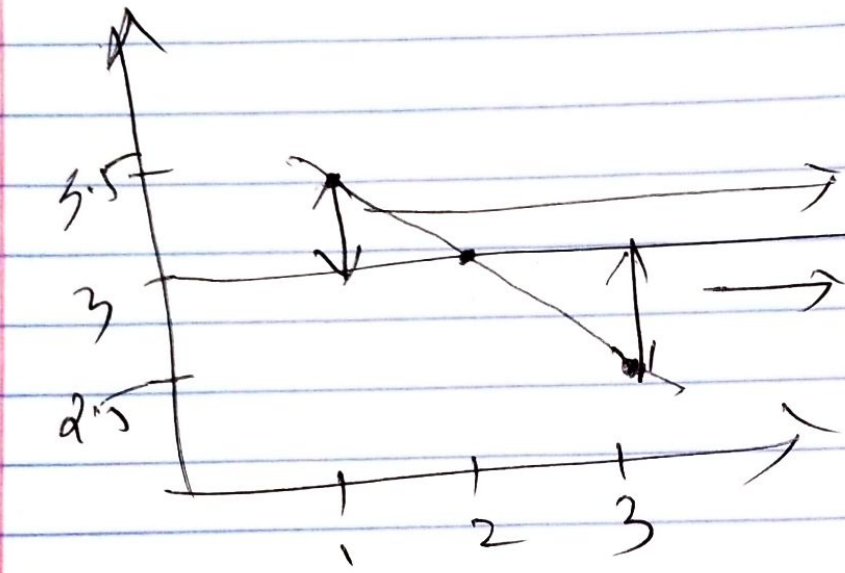
$= 0.25 + 0.25$

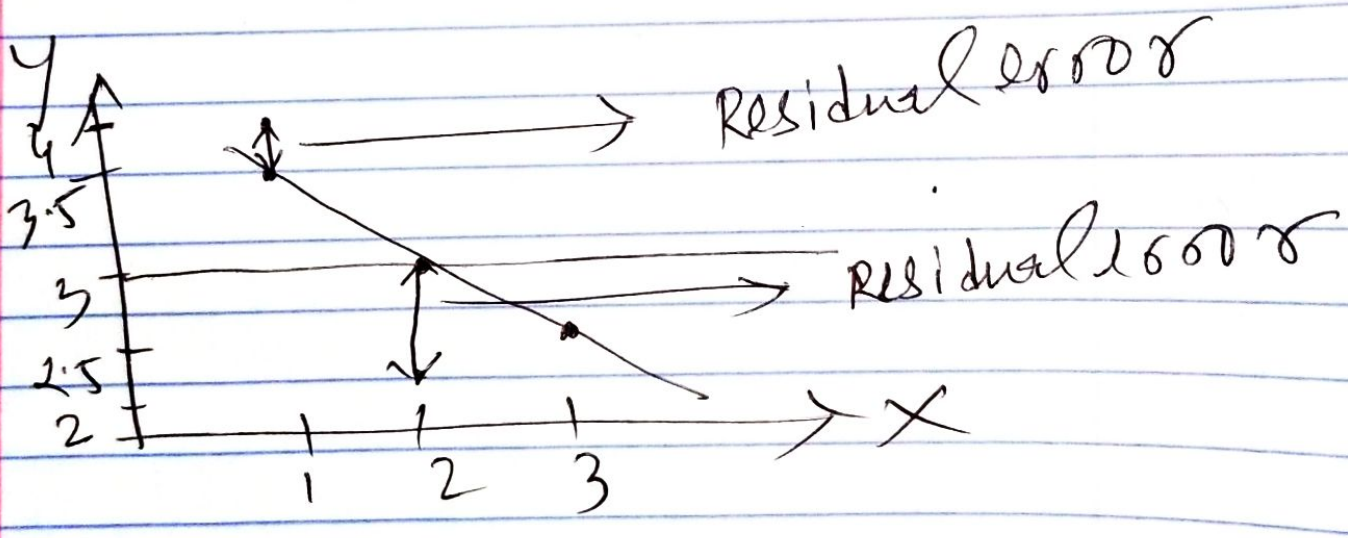
$= 0.5$

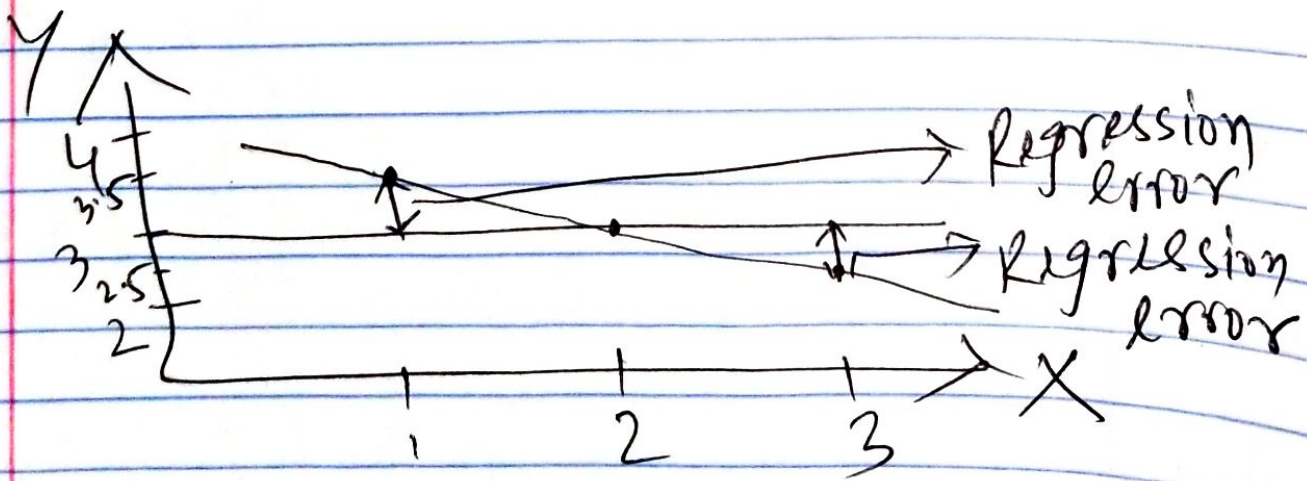
$SST = SSE + SSR$

$\Rightarrow 2 = 1.5 + 0.5$

i)


3.5
3
2.5
1
2
3
total error
total error


Y
4
3.5
3
2.5
2
1
2
3
X
Residual error
Residual error


Y
4
3.5
3
2.5
2
1
2
3
X
Regression error
Regression error