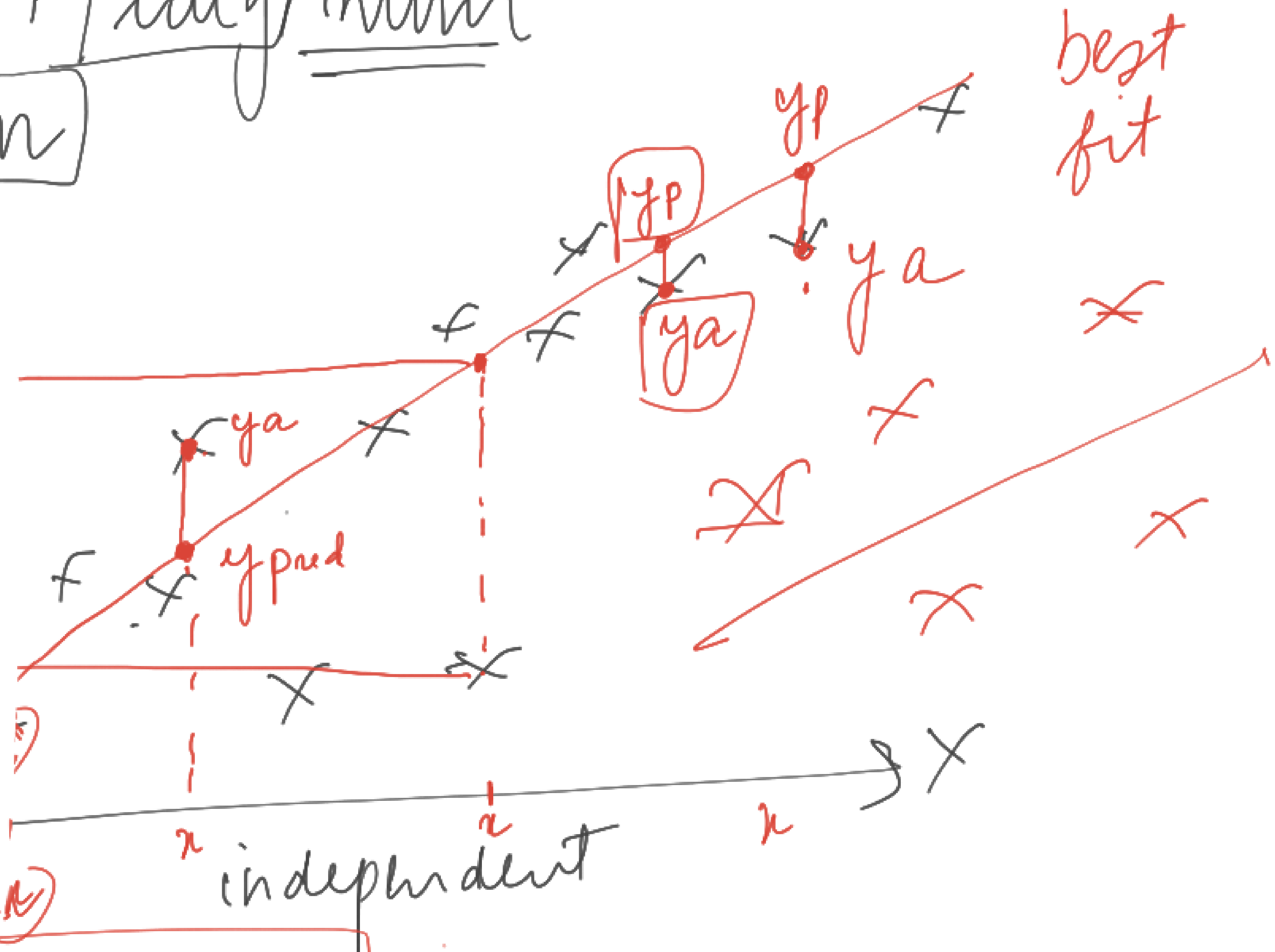
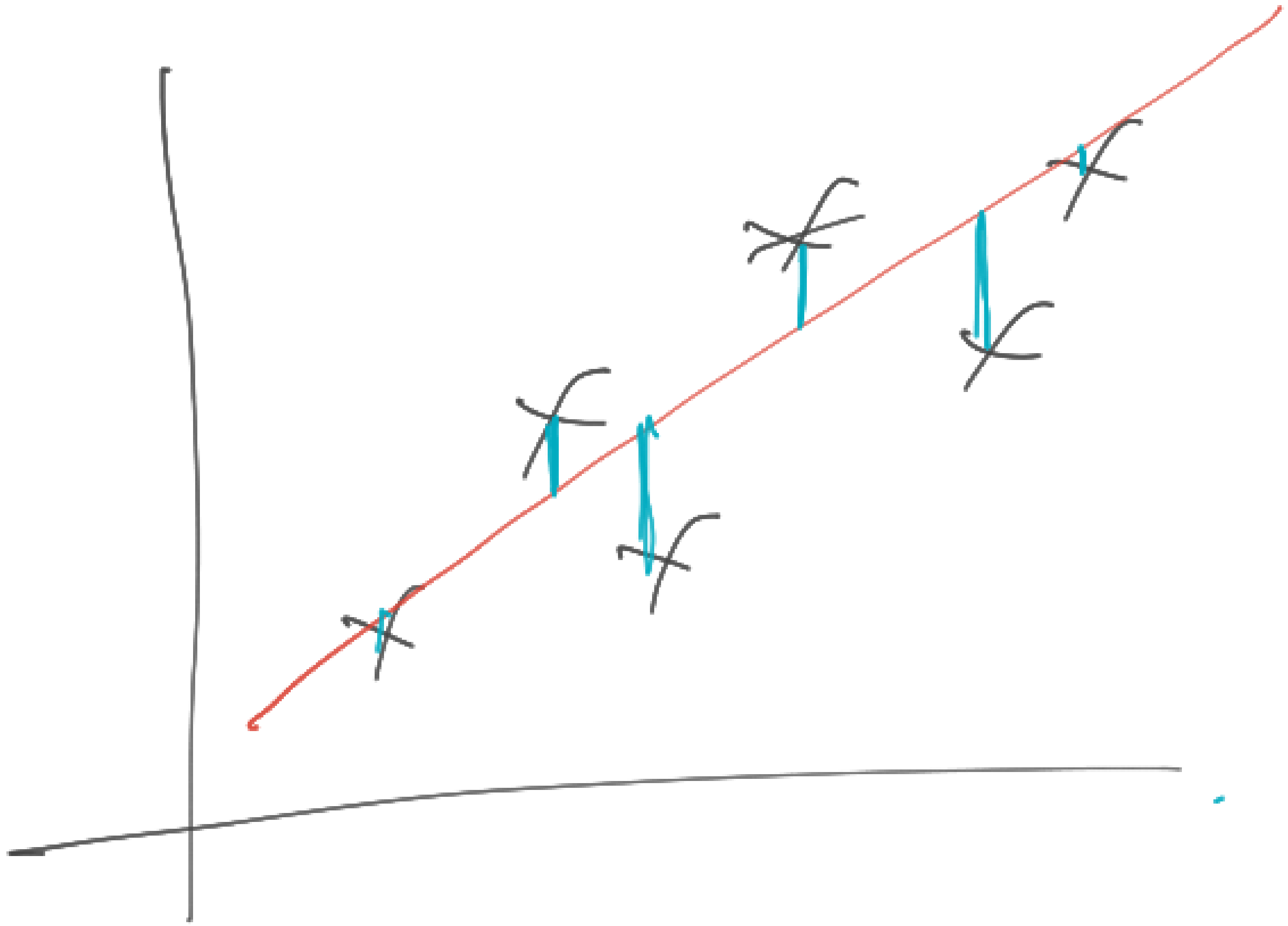
$\boxed{x} \rightarrow$ multiple, $\boxed{\text{catg}}$ num

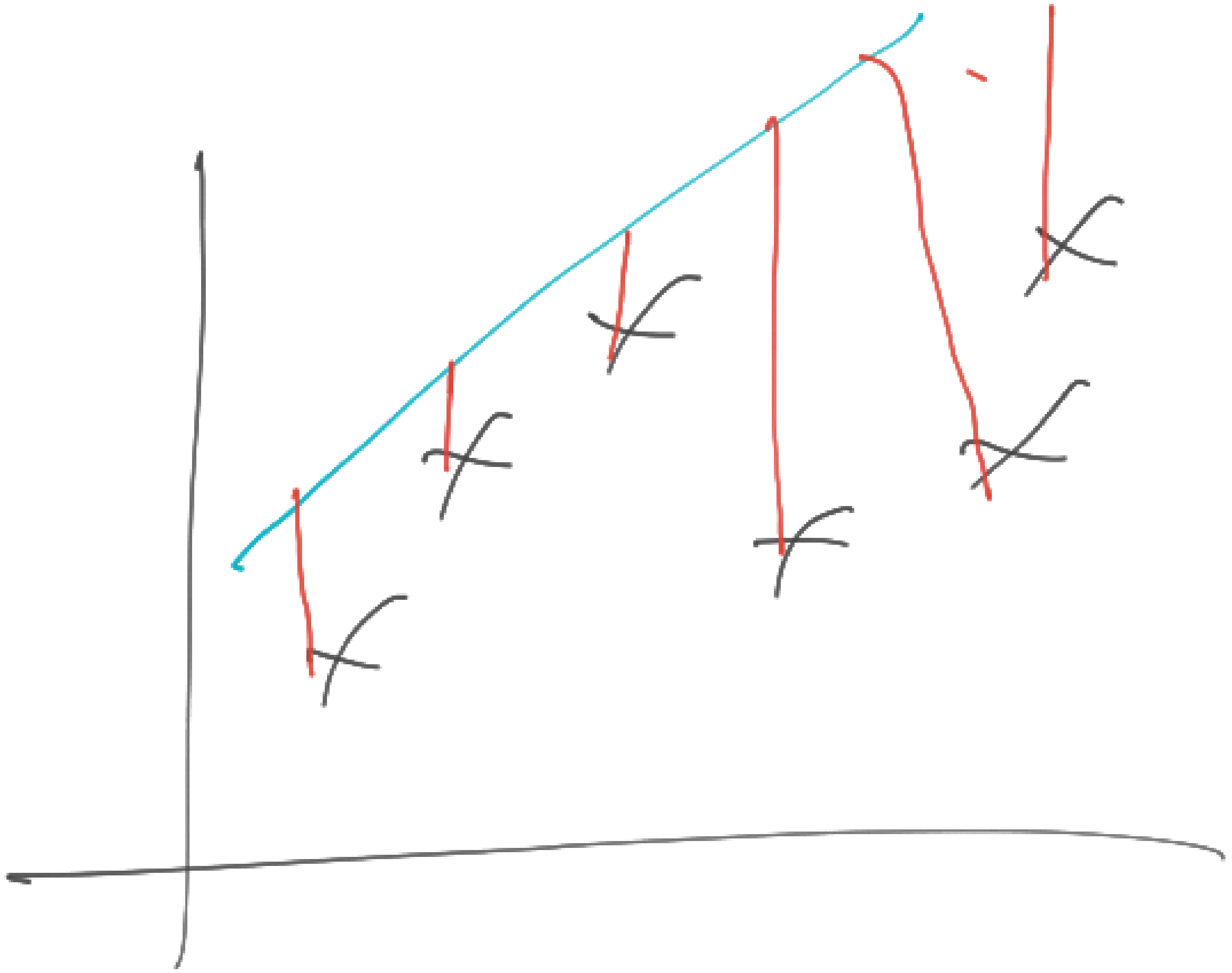
$y \rightarrow$ one $\boxed{\text{num}}$

x	y	y_{pred}
$x_1 \rightarrow$	ya_1	yp_1
x_2	ya_2	yp_2
x_3	ya_3	yp_3
	⋮	



$\boxed{y \text{ actual} \quad y \text{ pred}}$





y_{actual} − y_{pred} : 10 rows

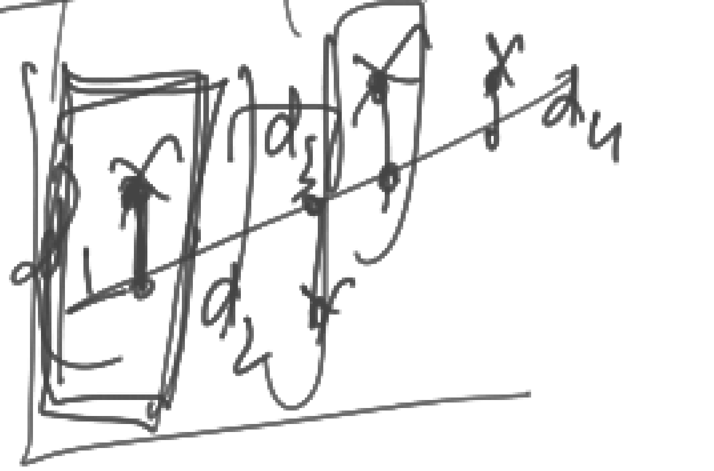
ya_1	ya_2	ya_3	...	ya_{10}
−	−			
yp_1	yp_2	yp_3	..	yp_{10}

x	ya	yp	
x_1	ya_1	yp_1	d_1
x_2	ya_2	yp_2	d_2
x_3	ya_3	yp_3	d_3
x_4	ya_4	yp_4	d_4
⋮			
			d_{10}

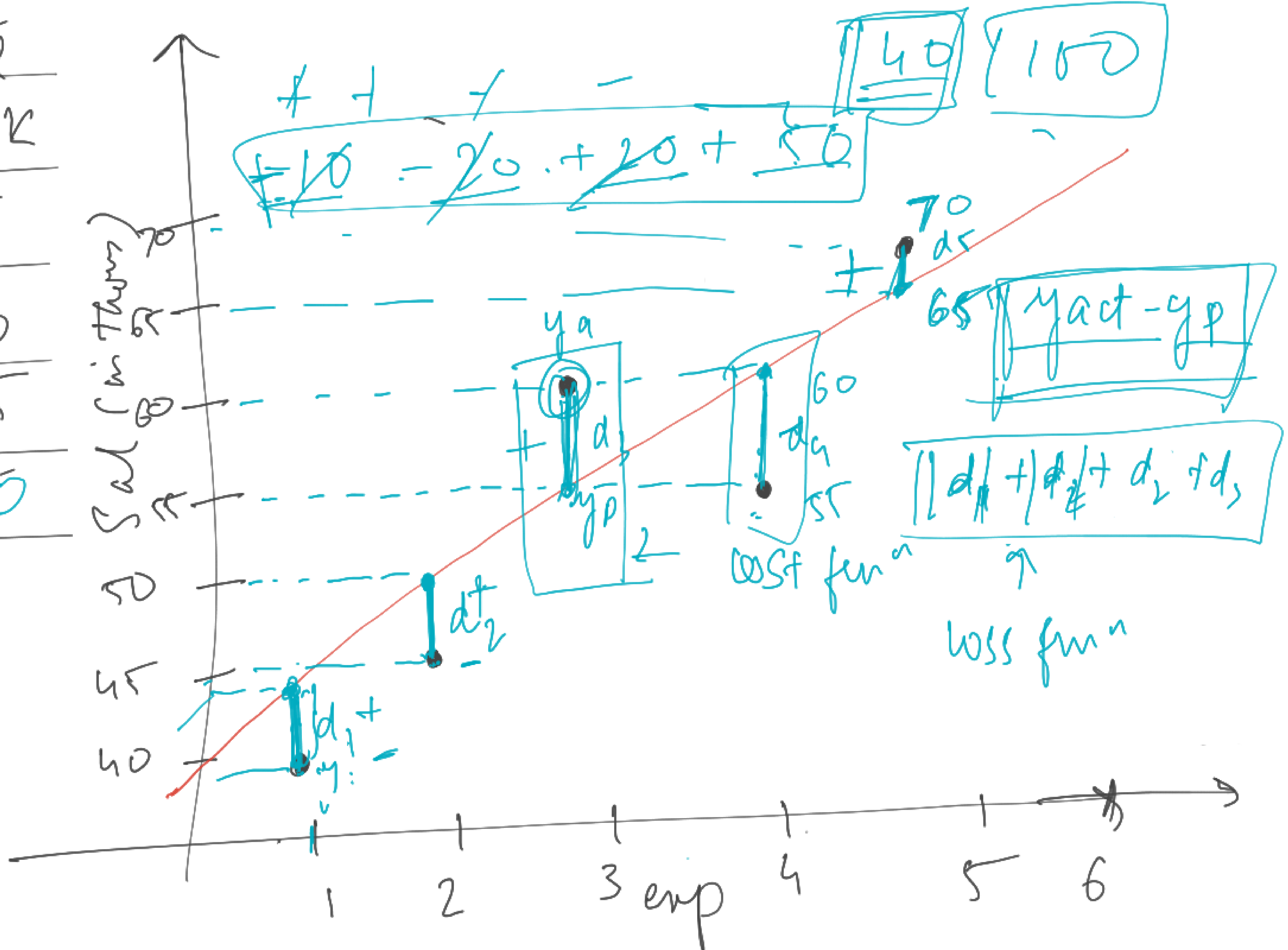
$$d_1 + d_2 + d_3 + d_4 + d_5 \;..\; d_{10}$$

loss funⁿ

total error ← error = $ya - yp$ → cost funⁿ



year (x)	sale (y)
1	40K
2	45
3	60
4	55
5	70



$\boxed{40-44}$

$y_{actual} - y_{pred} \rightarrow +ve$ a ↑ p ↓

$\rightarrow -ve$

-10×-10

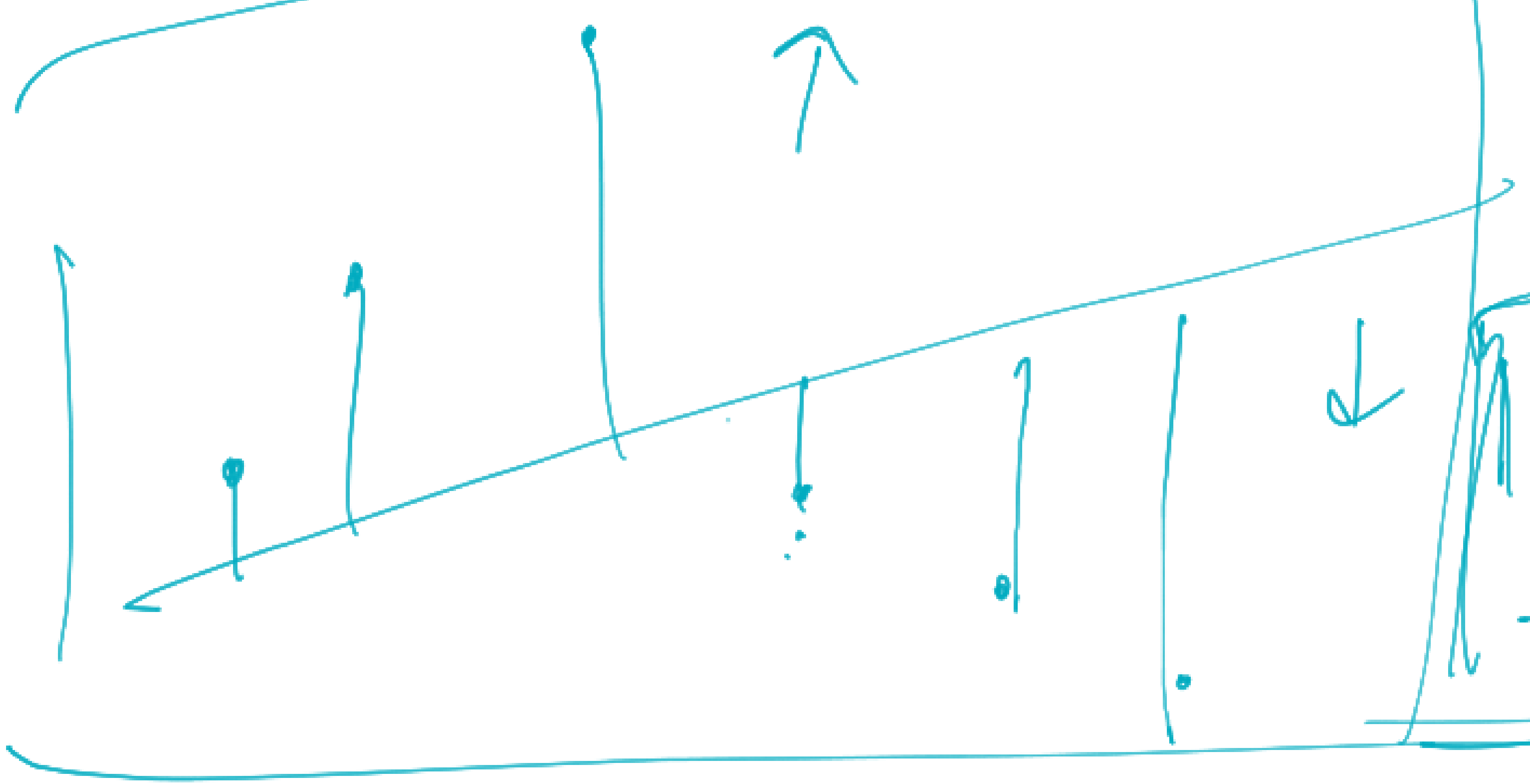
100

+ved

$d_1^2 + d_2^2 + d_3^2$

$\cancel{10} + \cancel{20} + \cancel{30} - \cancel{10} - \cancel{20} - \cancel{30} = 0$

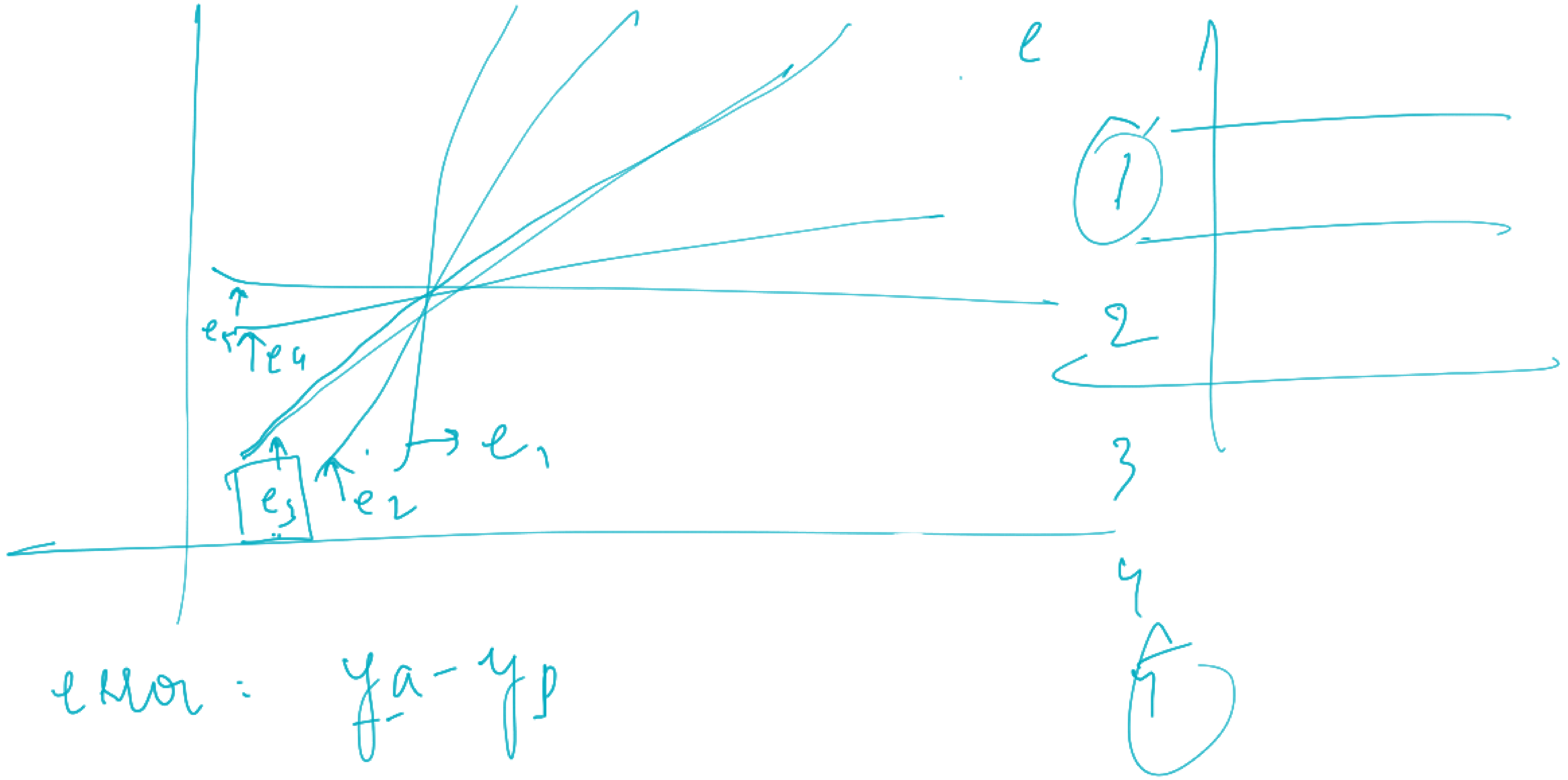
$10 + 20 + 30 + 10 + 20 + 30 = 120$



$= 0$

$|10| + |20| + |30| + |-10| + |-20| + |-30| \rightarrow$

Ordinary least square OLS



error : $y_a - y_p$

exp	ya	yp	ya - yp	$(ya-yp)^2$
1	40	45	-5	25
2	45	50	-5	25
3	60	55	+5	25
4	55	60	-5	25
5	70	65	+5	25
				125

9, 16, 25
4, 20,

$\frac{125}{5} = \boxed{25}$ sum

avg.

$\frac{125}{n=5}$

$\boxed{\text{total error}} = (ya_i - yp_i)^2 \quad i \to 1, 5$

$(ya_1 - yp_1)^2 + (ya_2 - yp_2)^2$

$\boxed{125} = \boxed{\sum_{i=1}^{n} (ya_i - yp_i)^2} \times \frac{1}{n}$

mean erro

$$\frac{\text{sum of marks got}}{\text{no. of std}} \qquad \frac{50+60+75+50+45}{5}$$

$\Rightarrow$ avg

$$\frac{\boxed{\text{total error}}^2}{2n} \Rightarrow \text{avg. error} \Rightarrow \text{mean error}$$

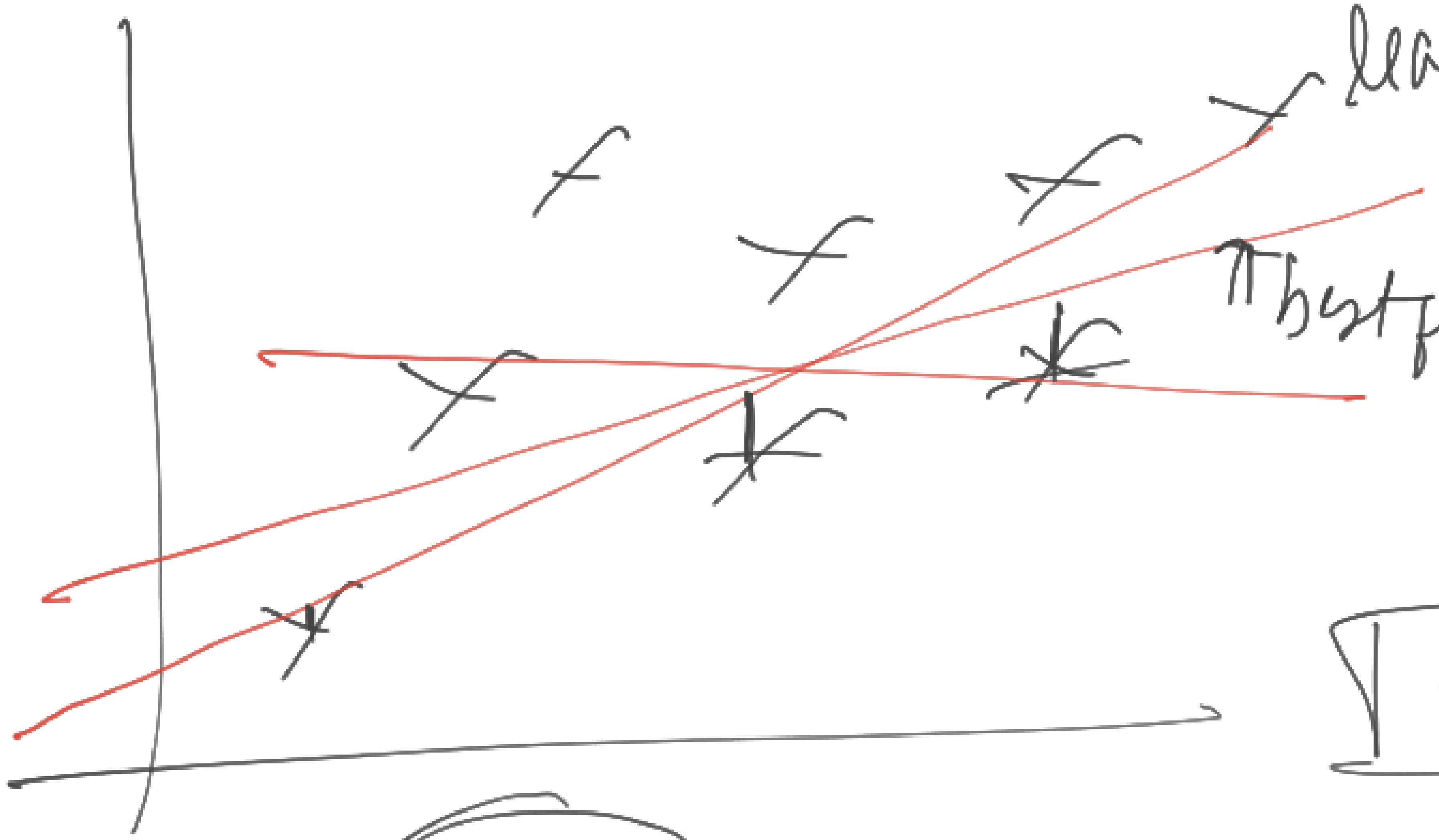
$\boxed{10{,}000}$

$\boxed{1000}$ $45 \rightarrow 46$

$\searrow 44$

mean error : $\frac{1 \times \text{total error}}{2n}$

$$\sum_{i=1}^{n} (y_a - y_p)^2$$



least $\boxed{\text{error}}$

best fit

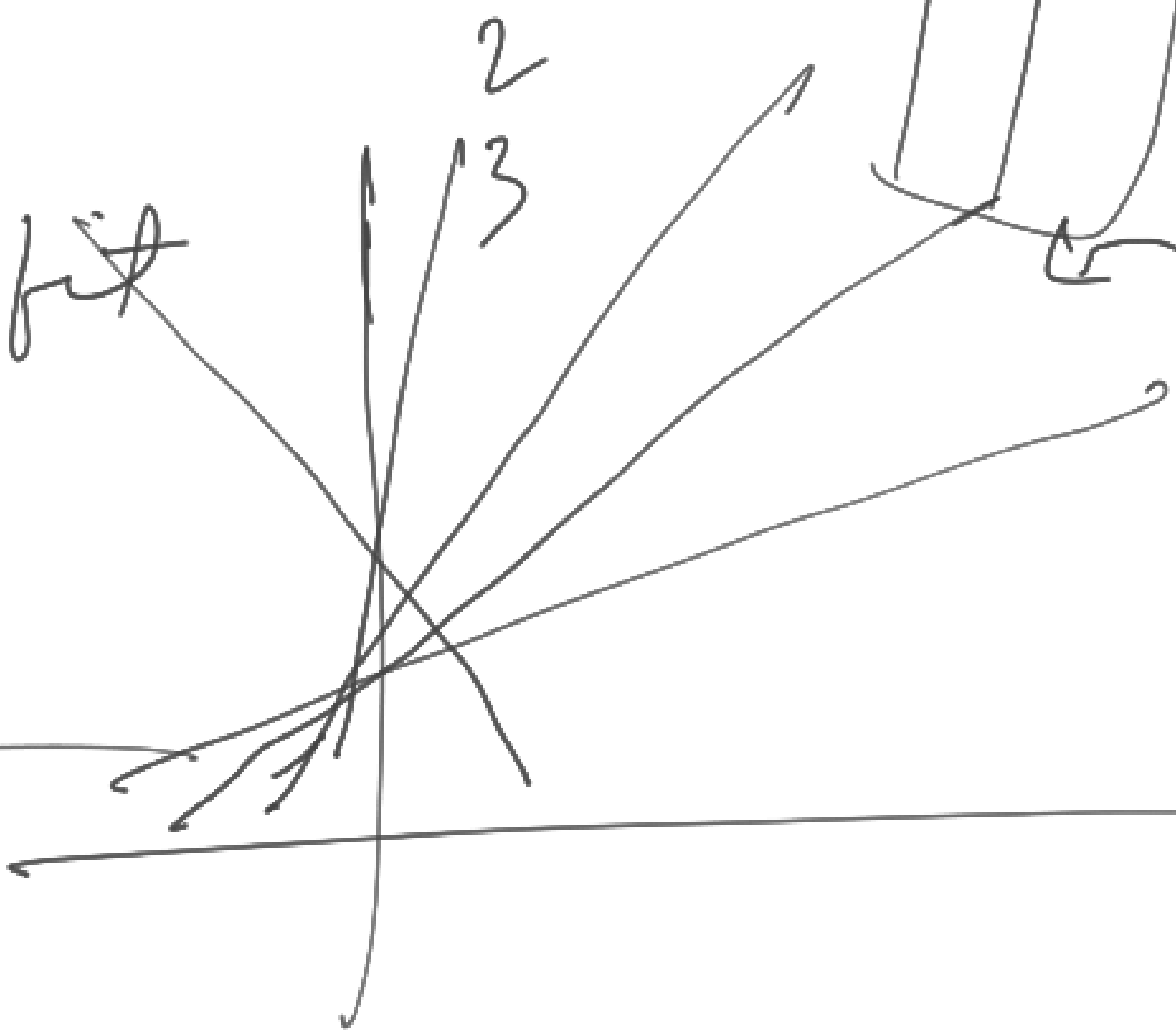
total error

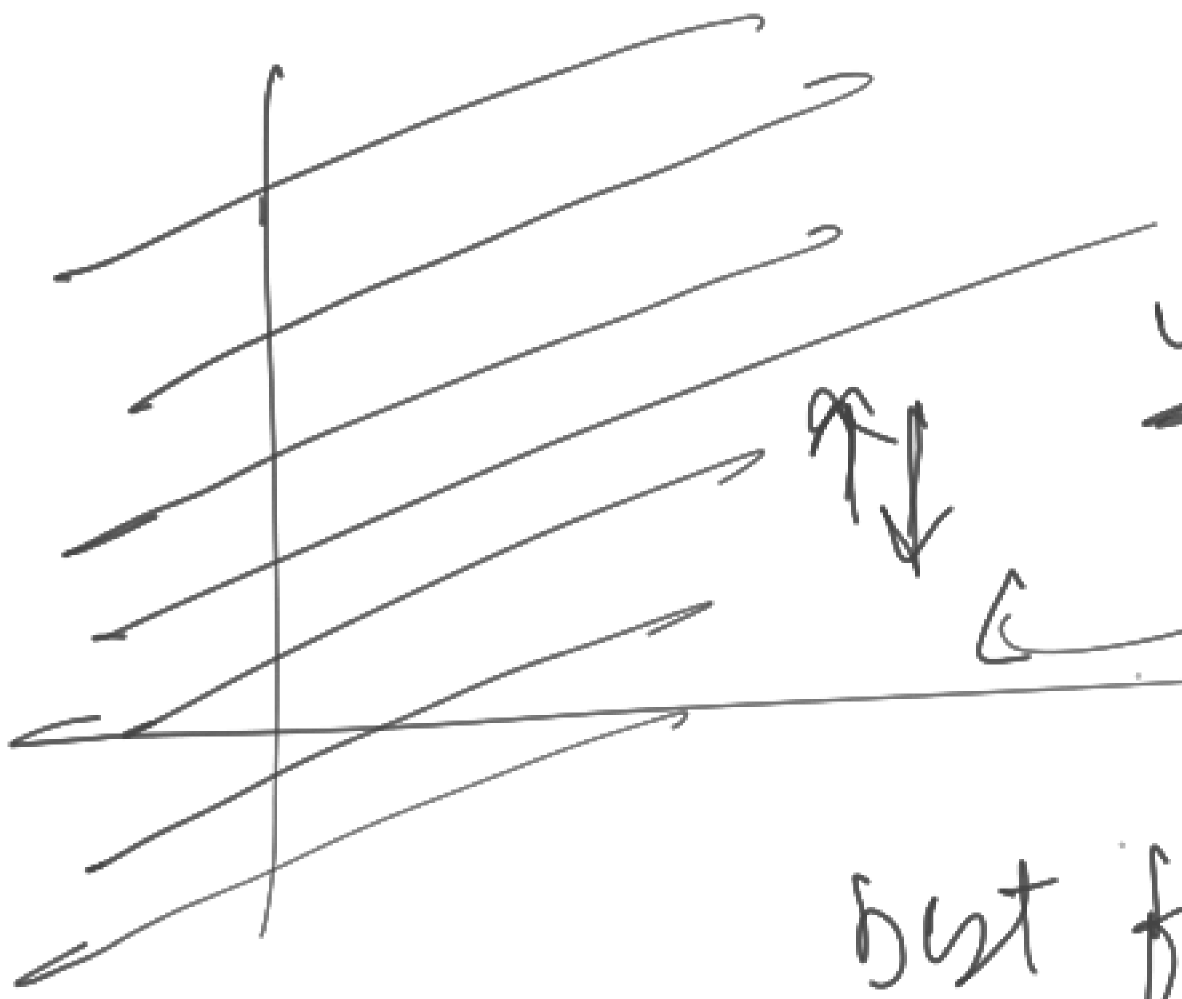
$(y_a - y_p)^2 + \ldots$

$\boxed{\text{total error ,}}$

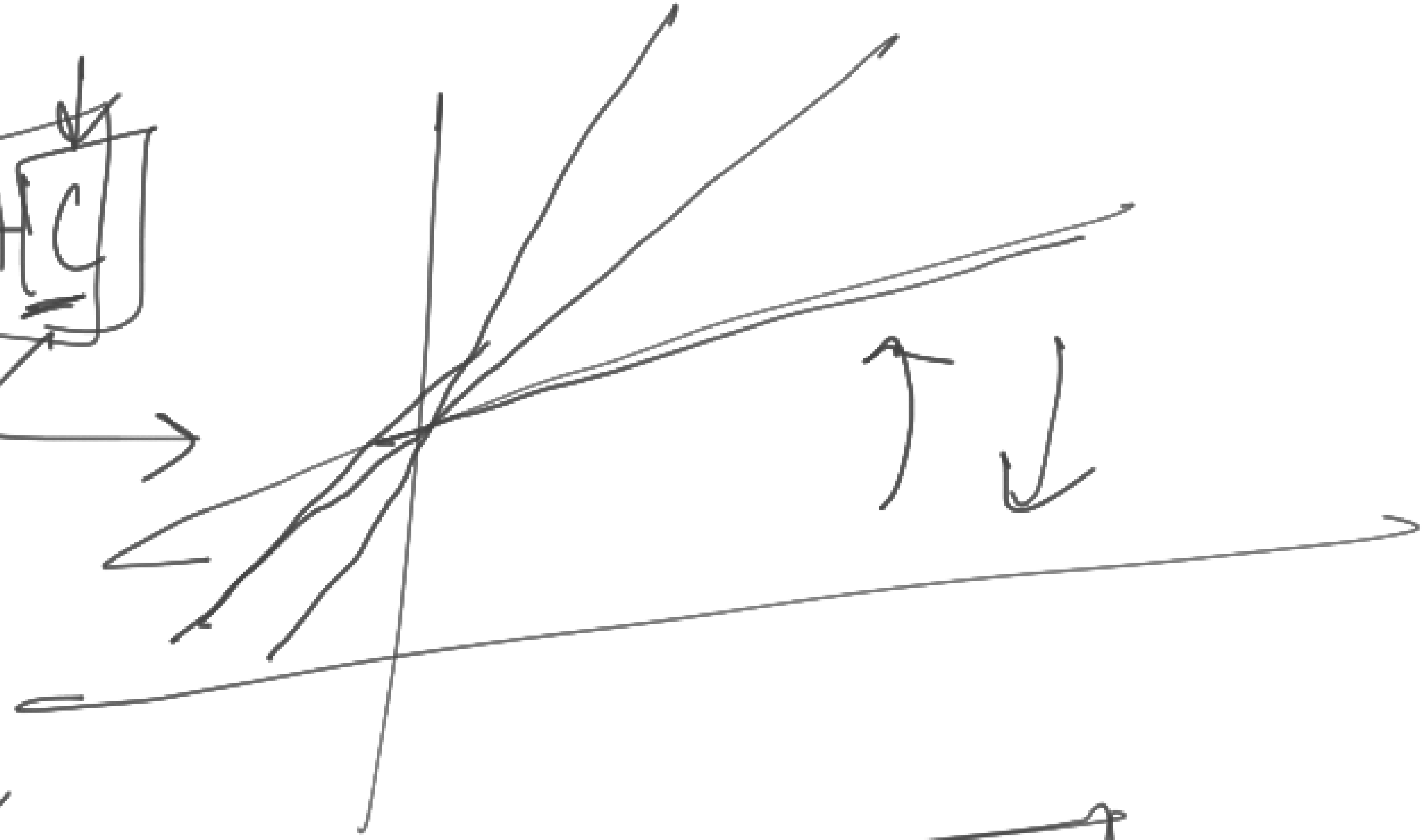
$\boxed{y = mx + c}$ ← best fit

m, c





$y = \underline{m}x + \underline{c}$



best fit line

opti

loss fun^n $= \boxed{\sum_{i=1}^{n} (y_a - \boxed{y_p})^2}$ $\boxed{m, c}$

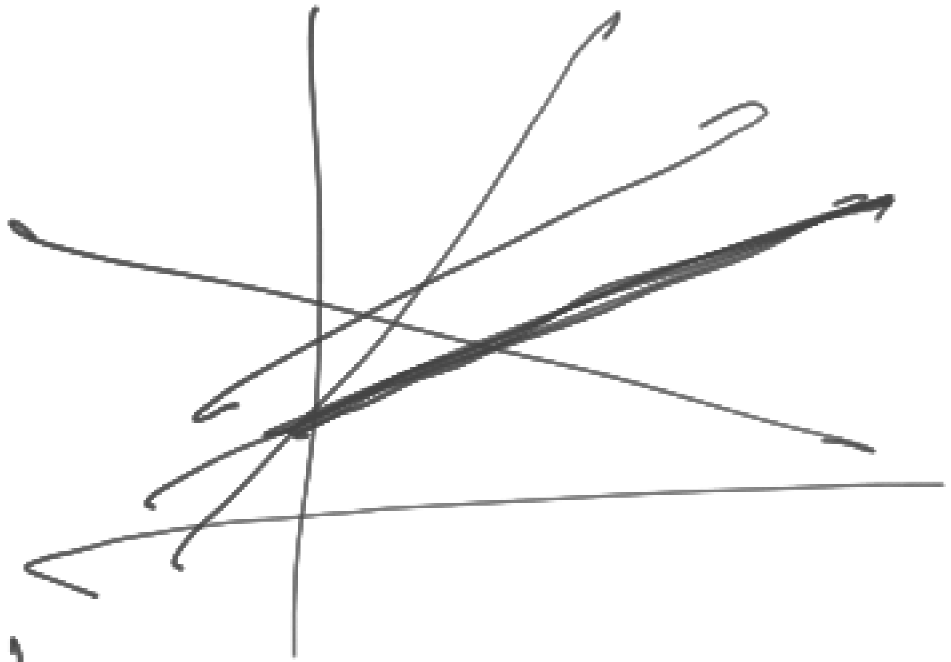
$mx + c$

$\sum (y_a - (\underline{m}x + \underline{c}))^2$

optimization

best → least error

$y_p = mx + c$



loss fun = $\sum (y_a - y_p)^2$

$\sum (y_a - (mx + c))^2$