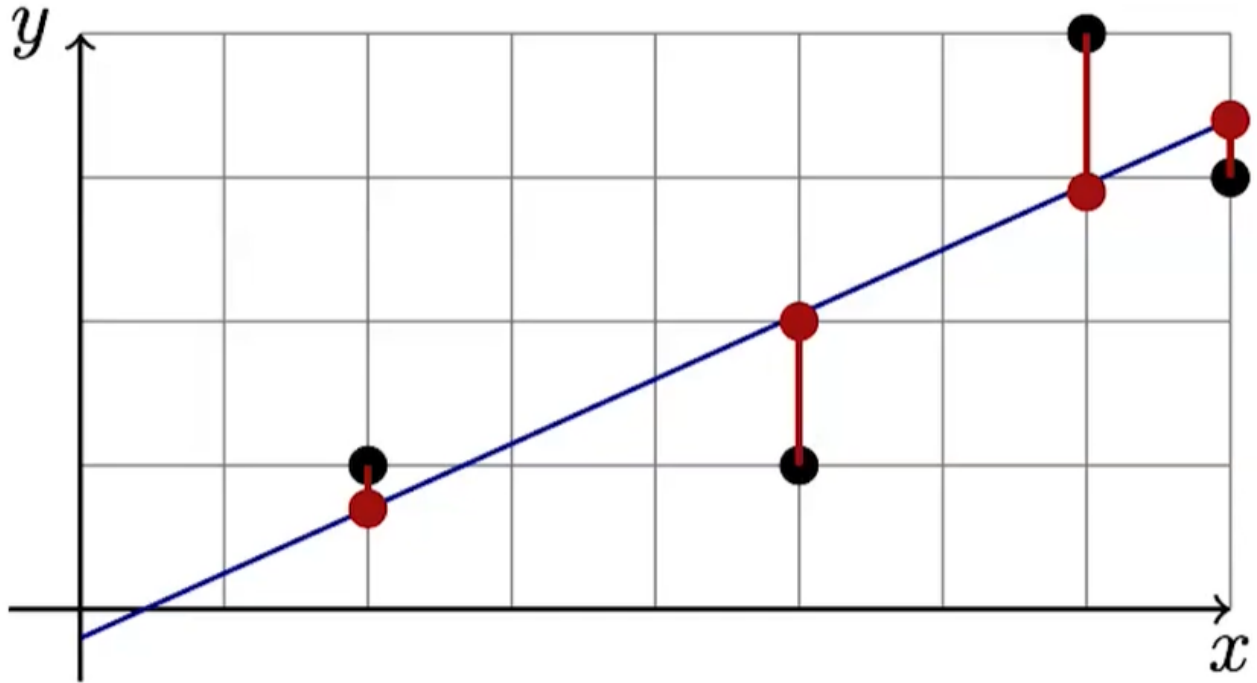


# Deviation

This is closely related to [Least Squares](#)



The red lines are the deviation/error/residuals in approximation.

We were finding an  $\hat{x}$  to minimize  $\|A\hat{x} - b\|$ .

This is the same thing as minimizing  $\|A\hat{x} - b\|^2$ .

Now, over all  $\hat{x}$ ,

$$\|A\hat{x} - b\|^2 = \|r\|^2 = \sum_{i=1}^n r_i^2$$

So basically we are trying to minimize the square of the residual.