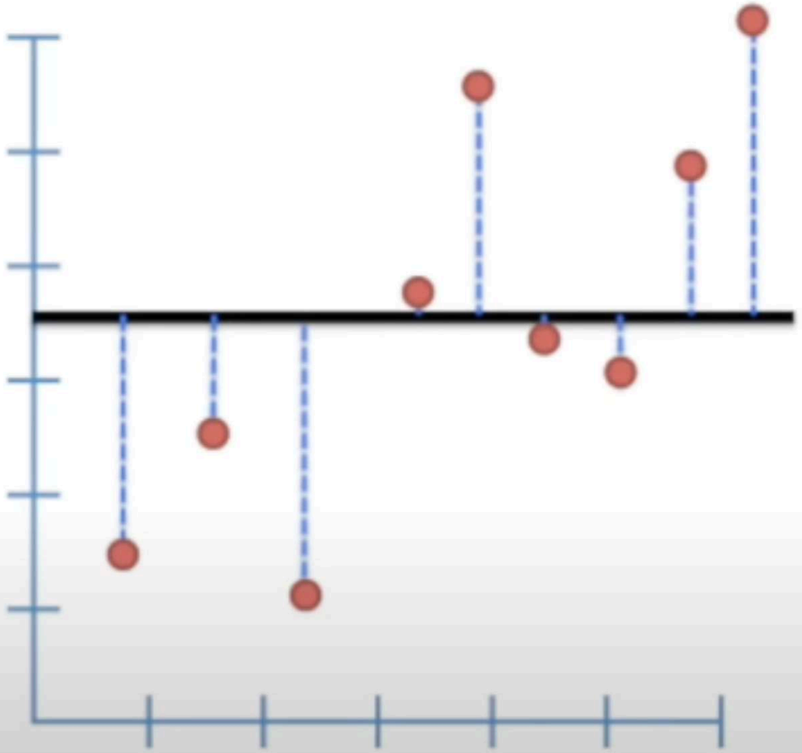
DATA ANALYTICS- UNIT 2

By

DEEPIKA KAMBOJ

Linear Regression

$$(b - y_1)^2 + (b - y_2)^2 + (b - y_3)^2 + (b - y_4)^2 + (b - y_5)^2 + (b - y_6)^2 + (b - y_7)^2 + (b - y_8)^2 + (b - y_9)^2$$



= 24.62

This is our measure of how well this line fits the data.

It's called the "sum of squared residuals, because the residuals are the differences between the real data and the line, and we are summing the square of these values.

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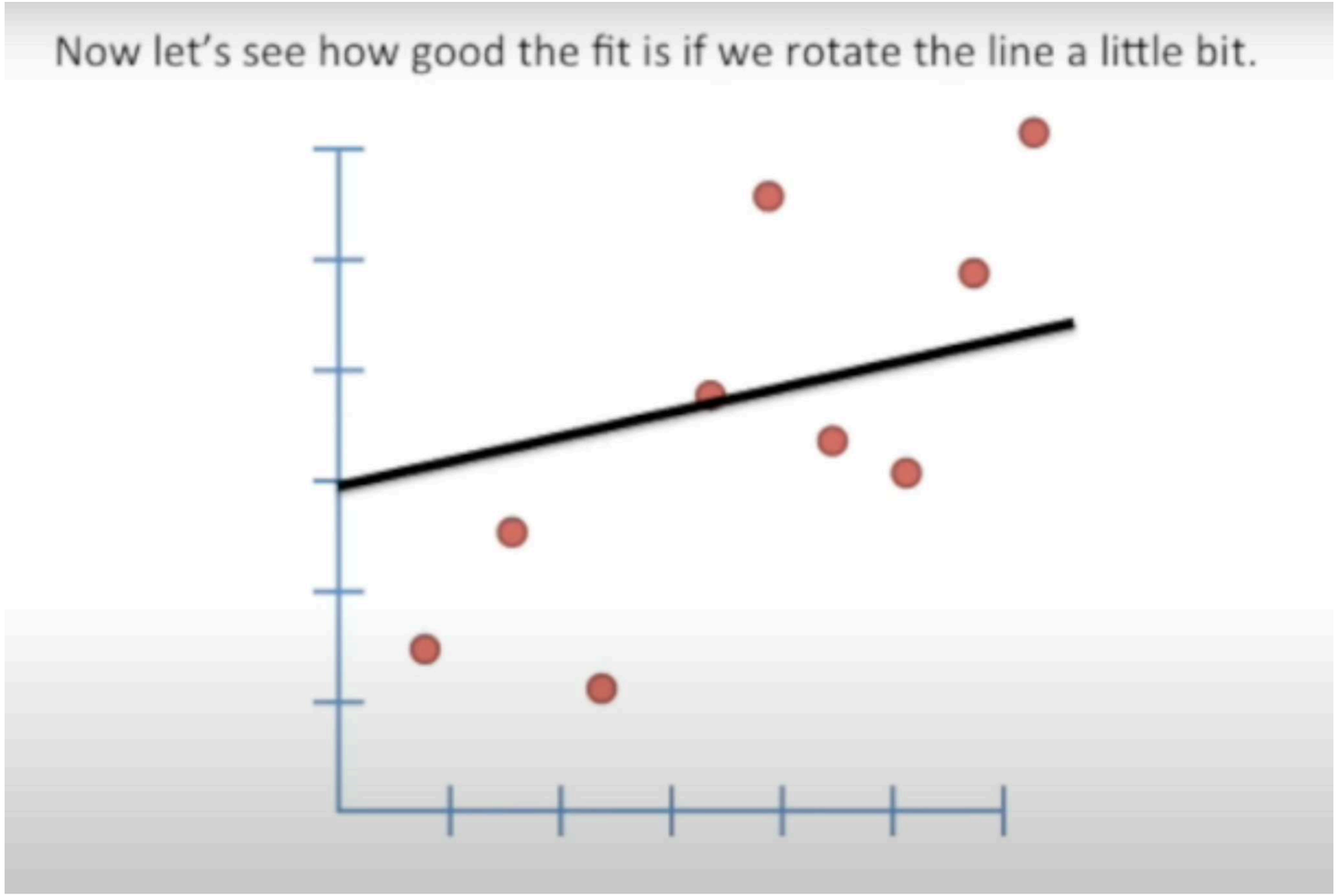
Linear Regression



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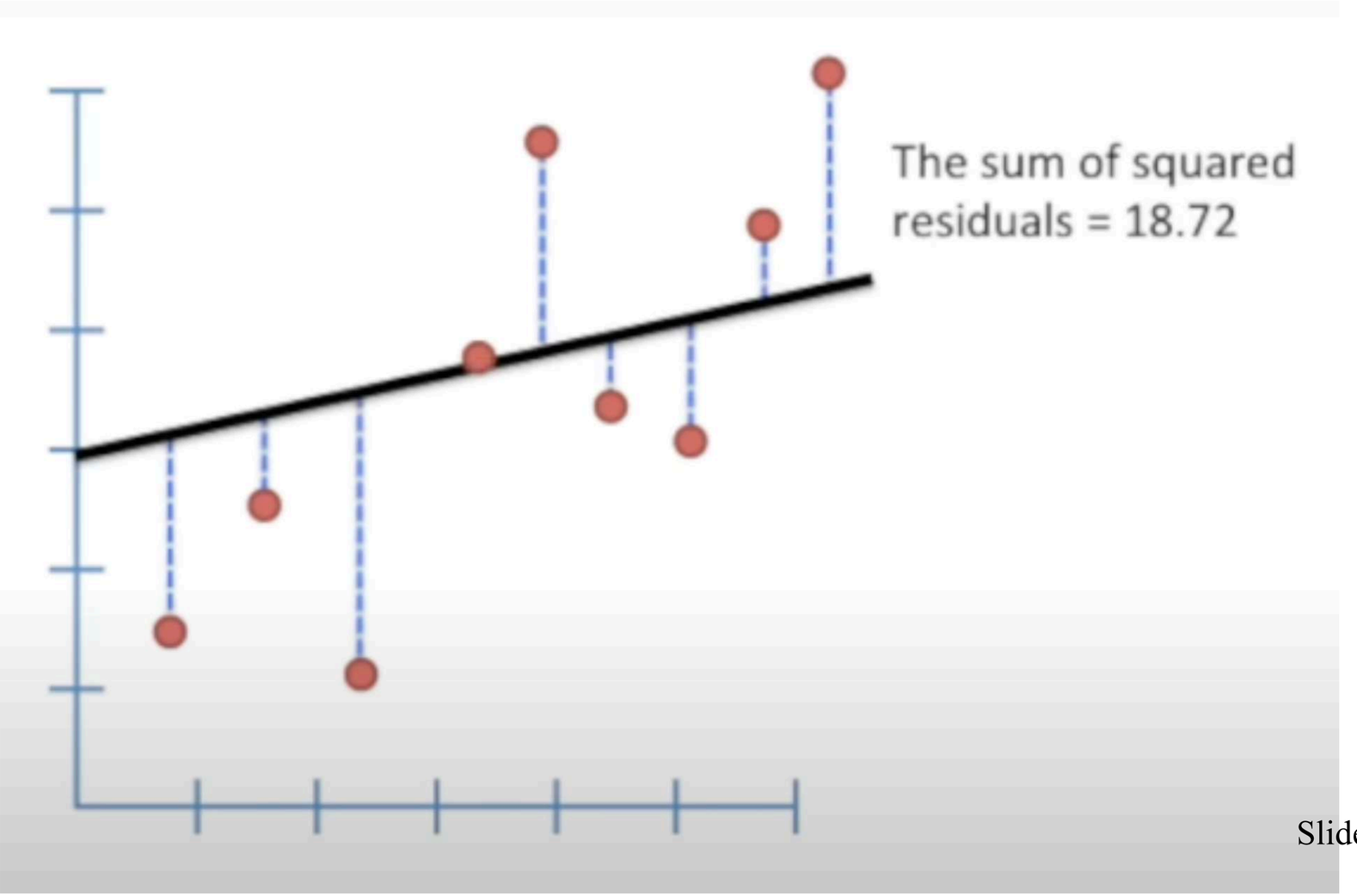

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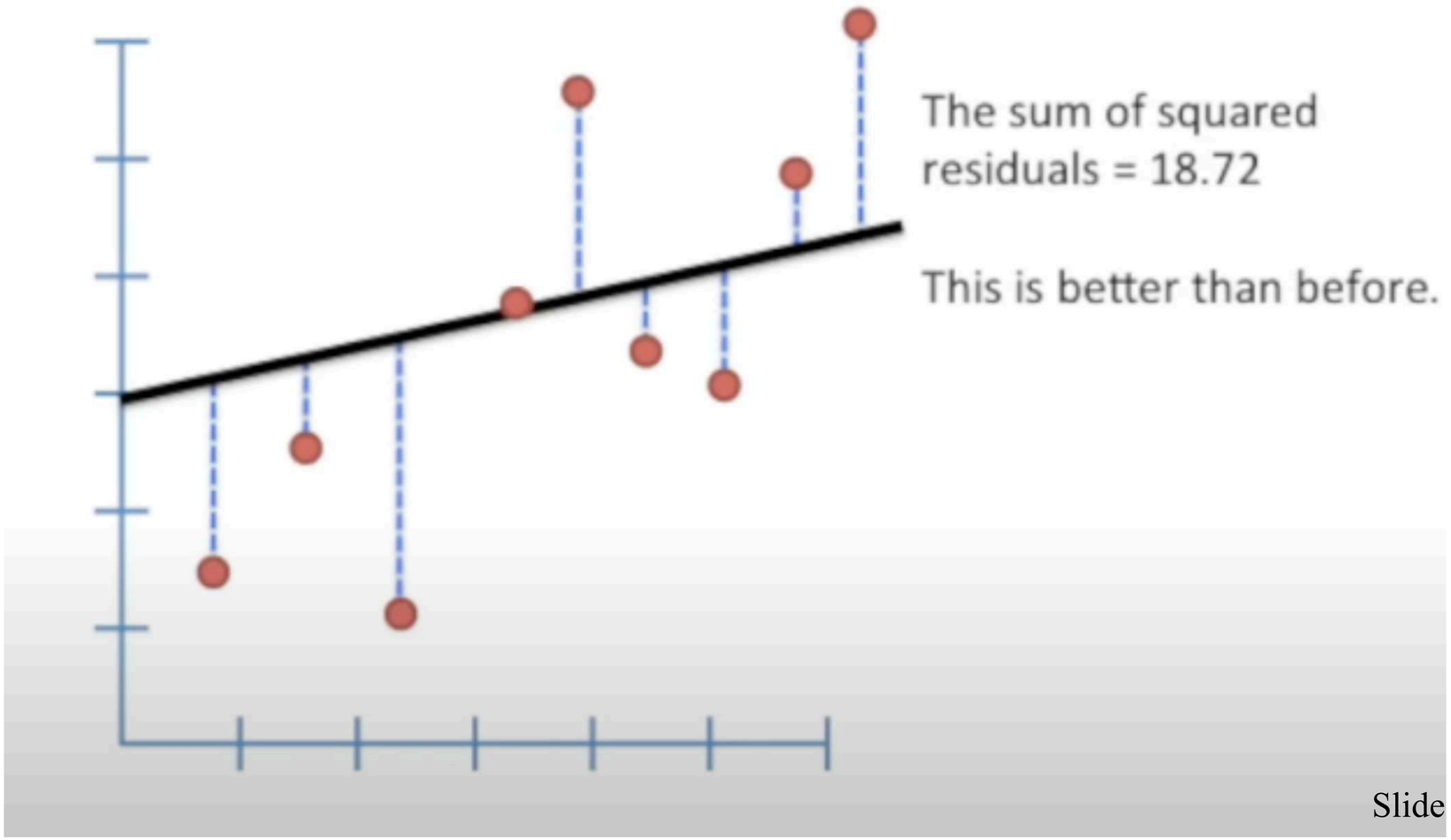

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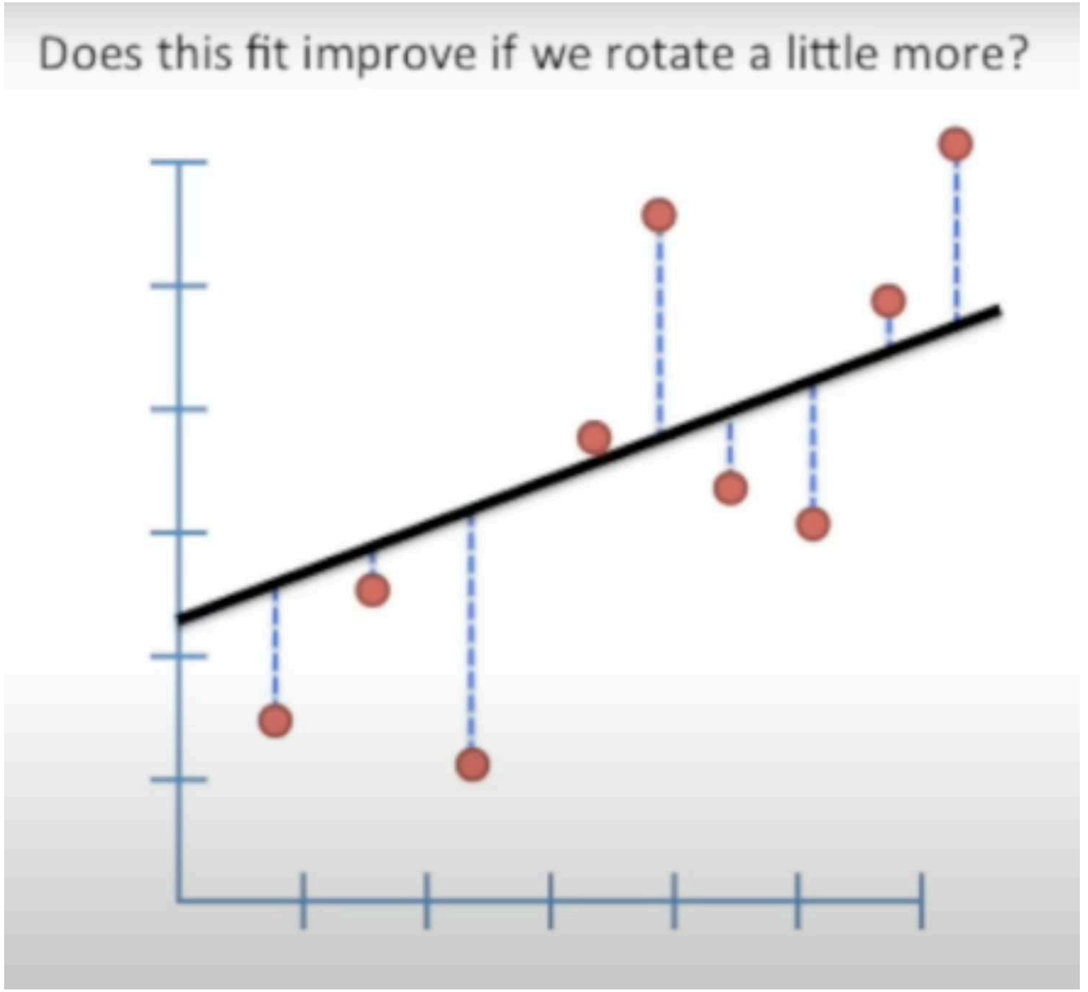

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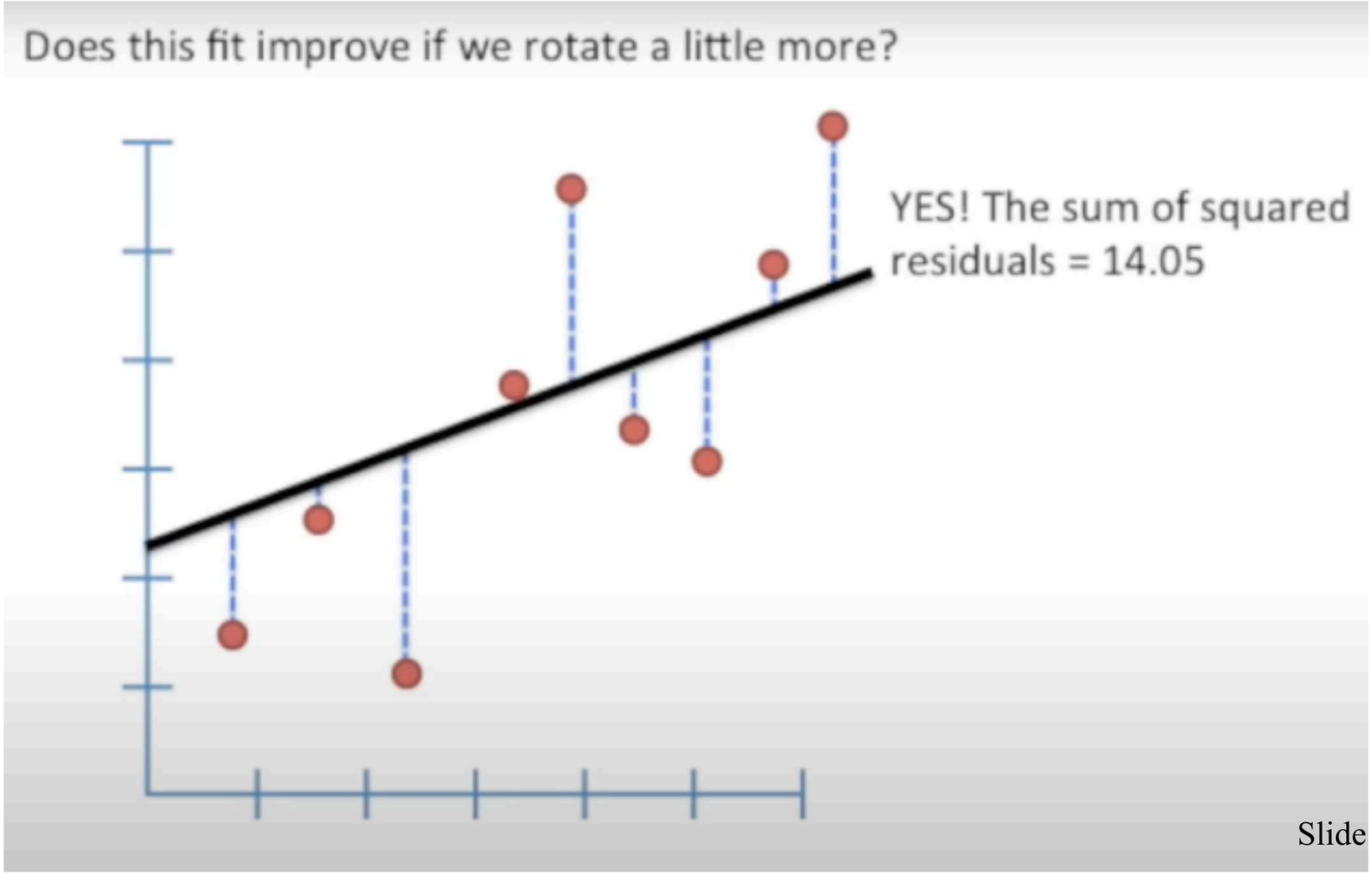

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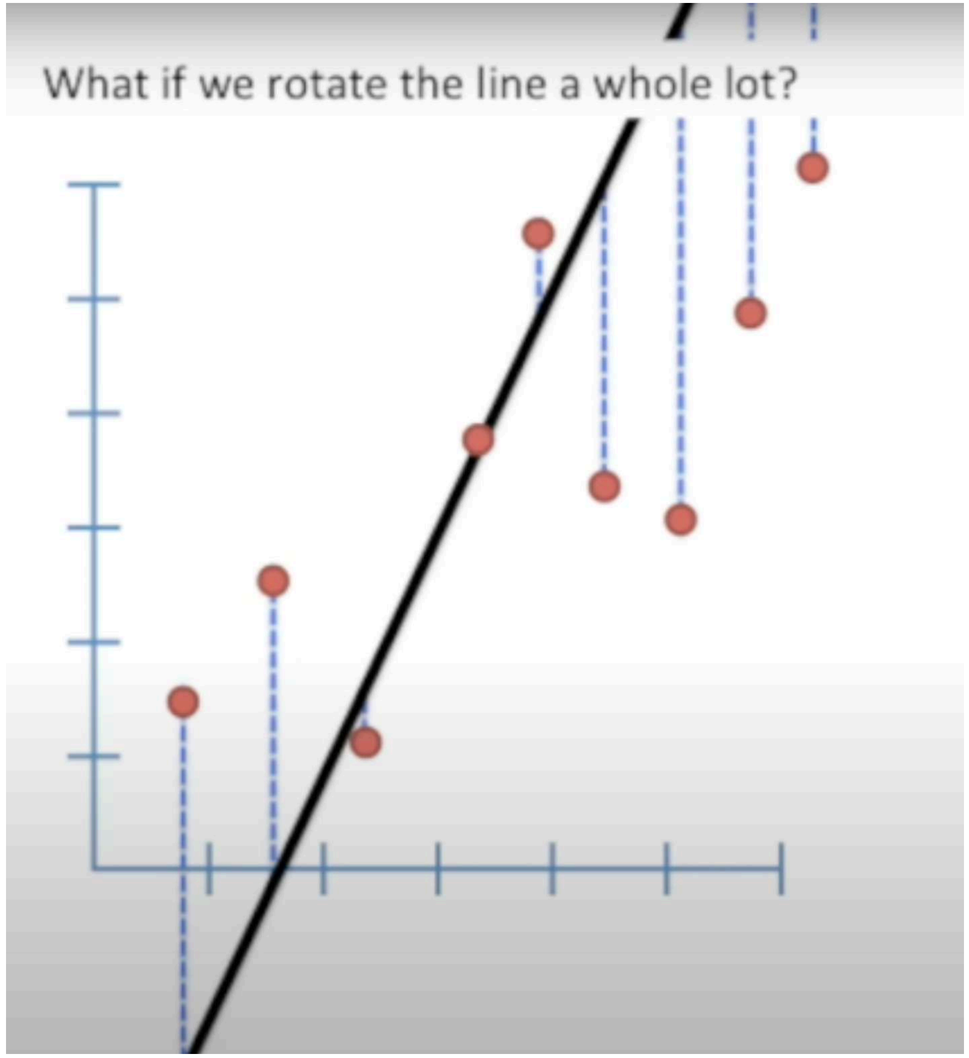

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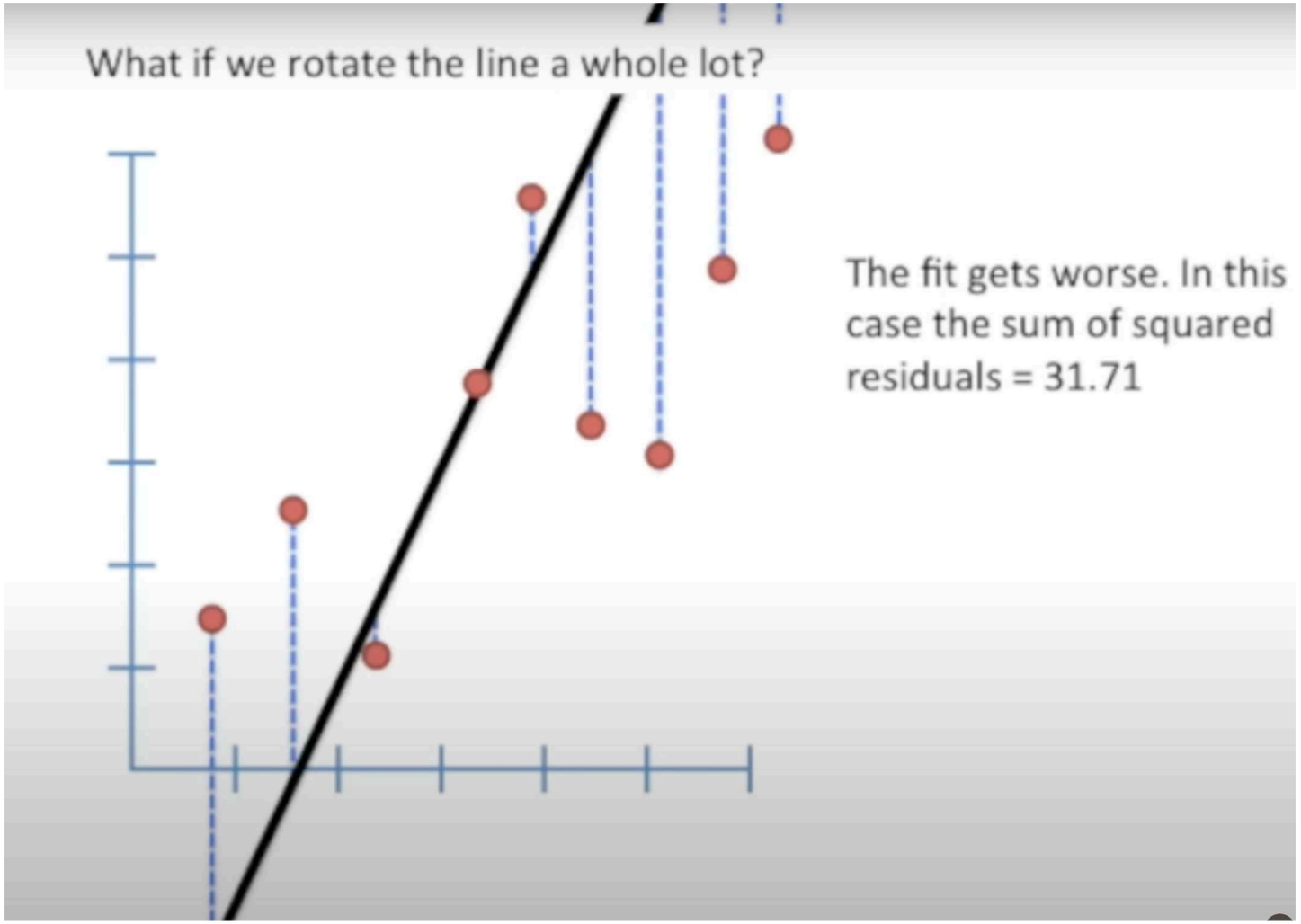

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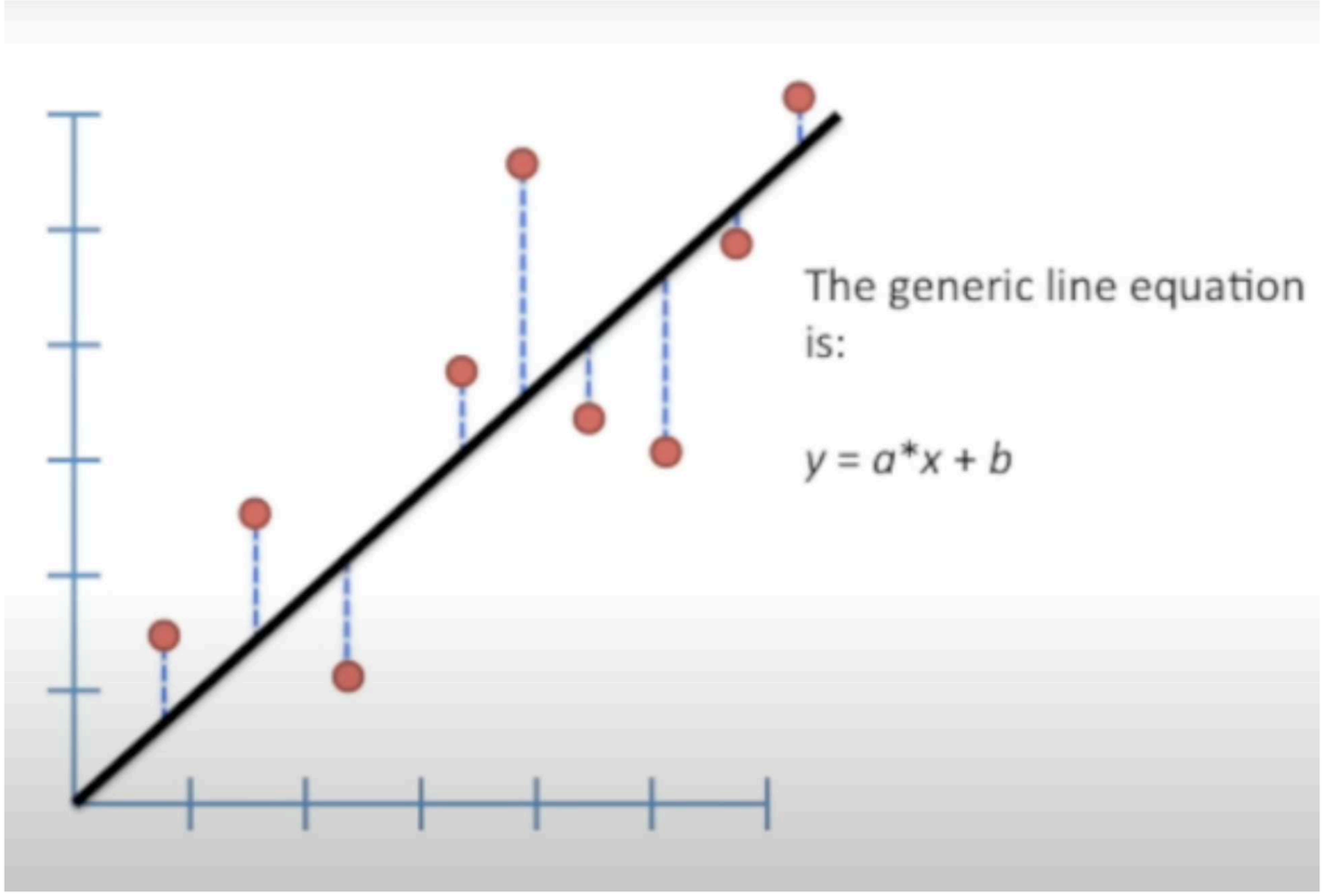

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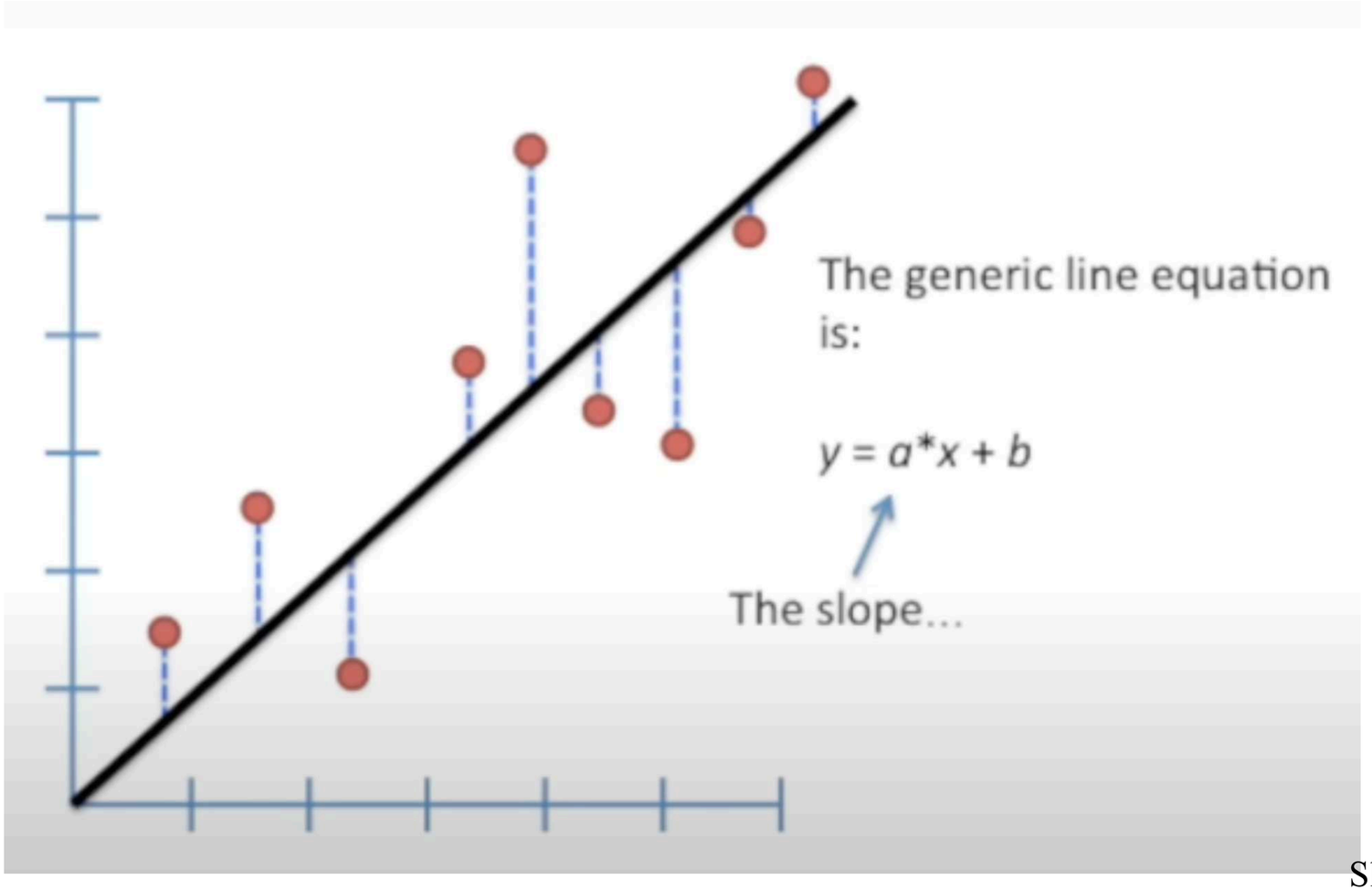

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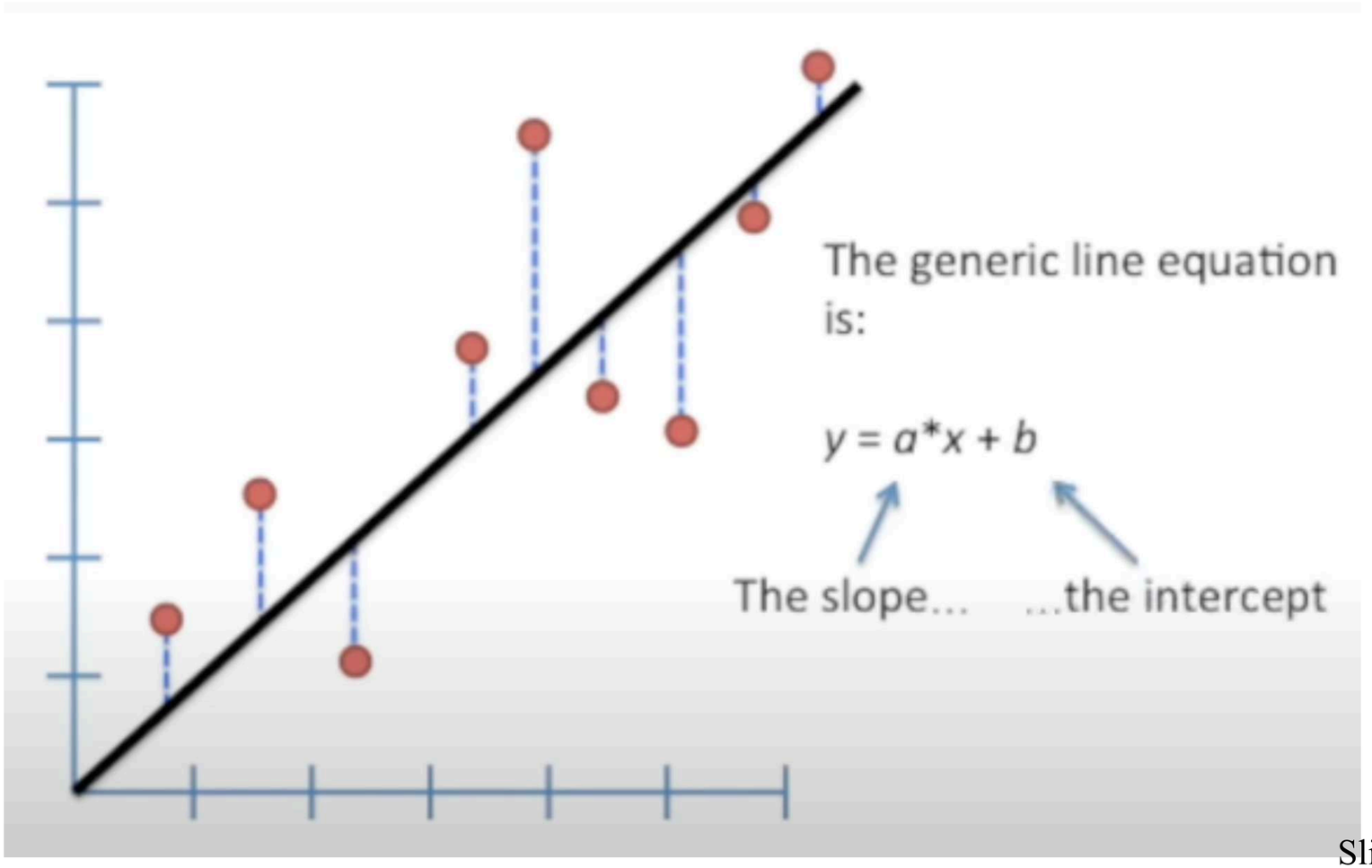

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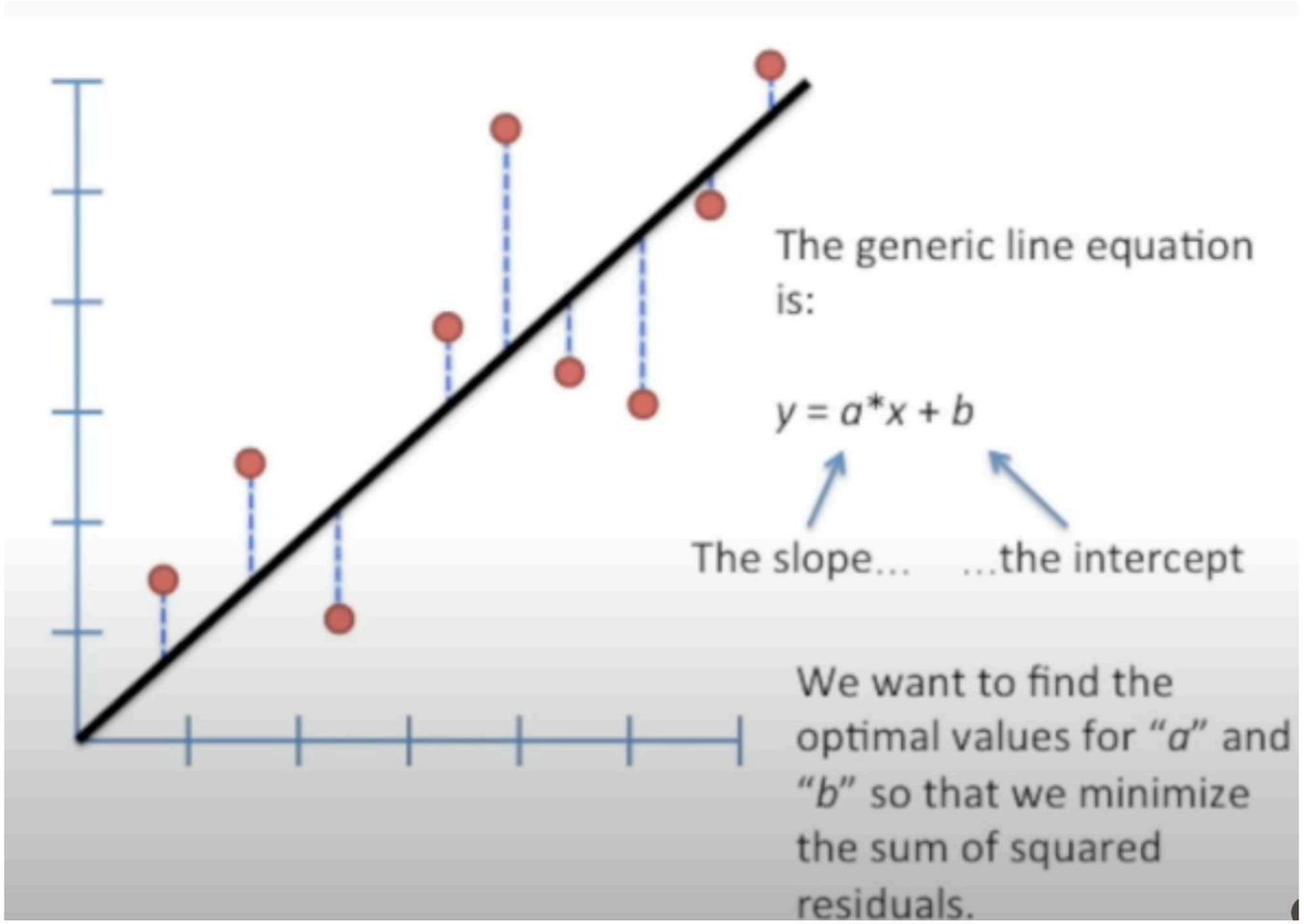

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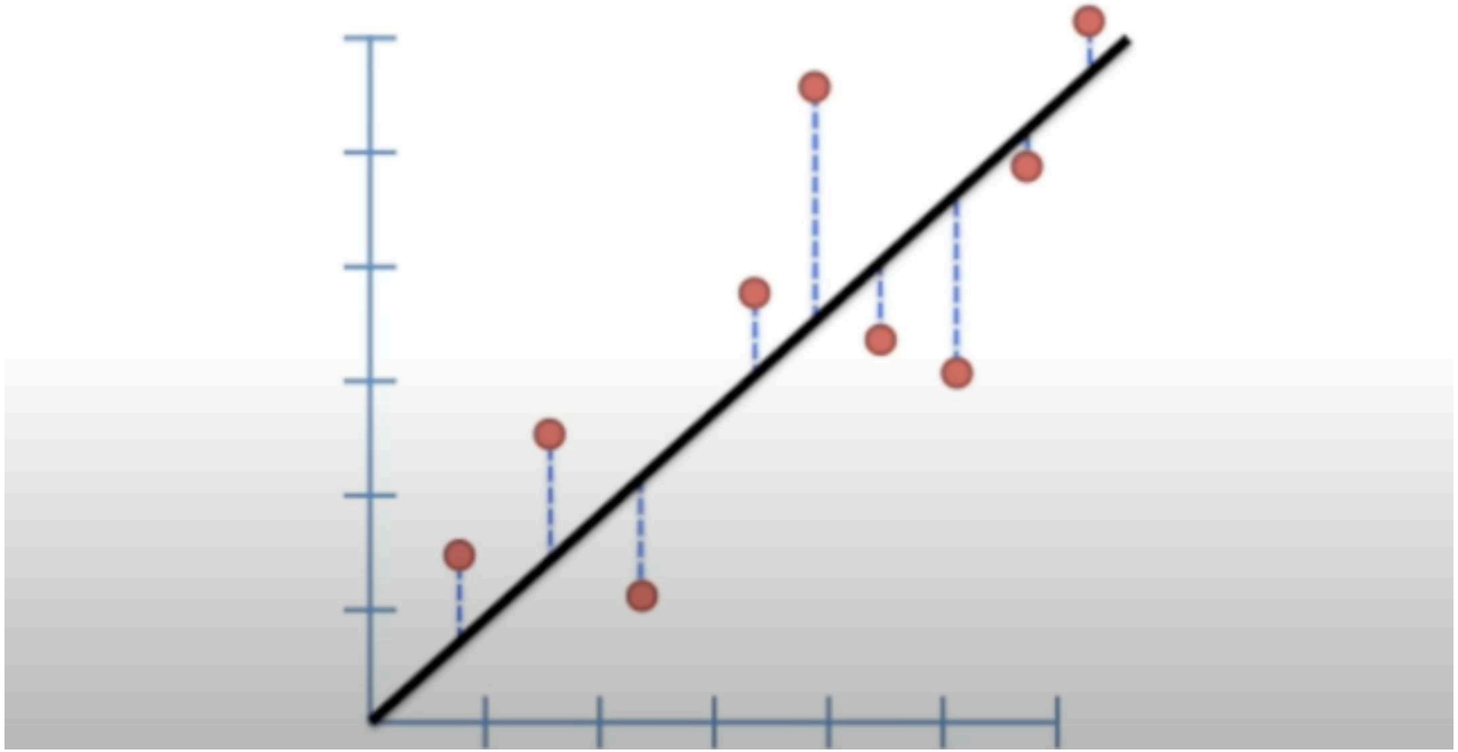
Linear Regression

In more general math terms…

Sum of squared residuals = $((a*x_1 + b) - y_1)^2 + ((a*x_2 + b) - y_2)^2 + \ldots$



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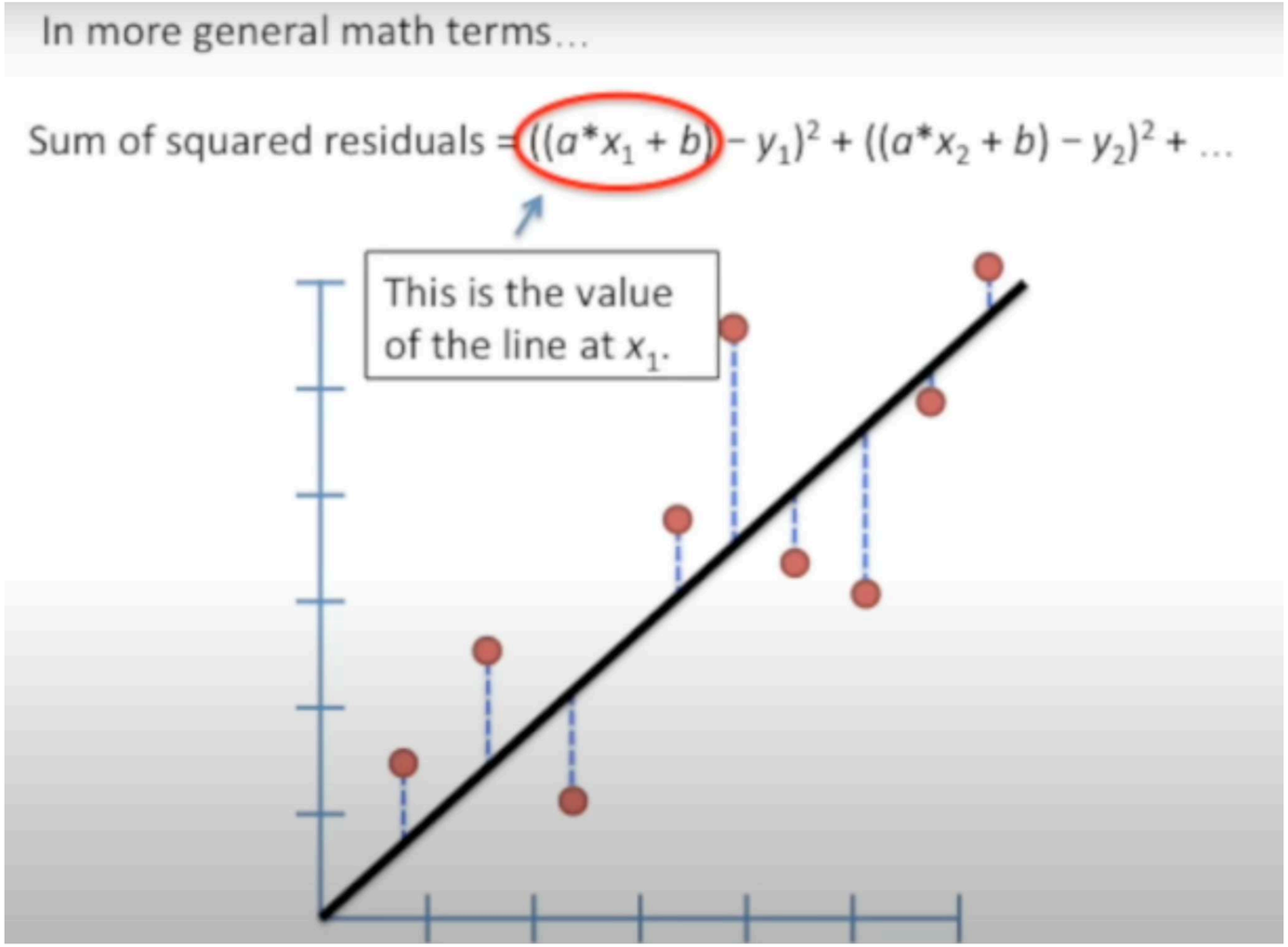

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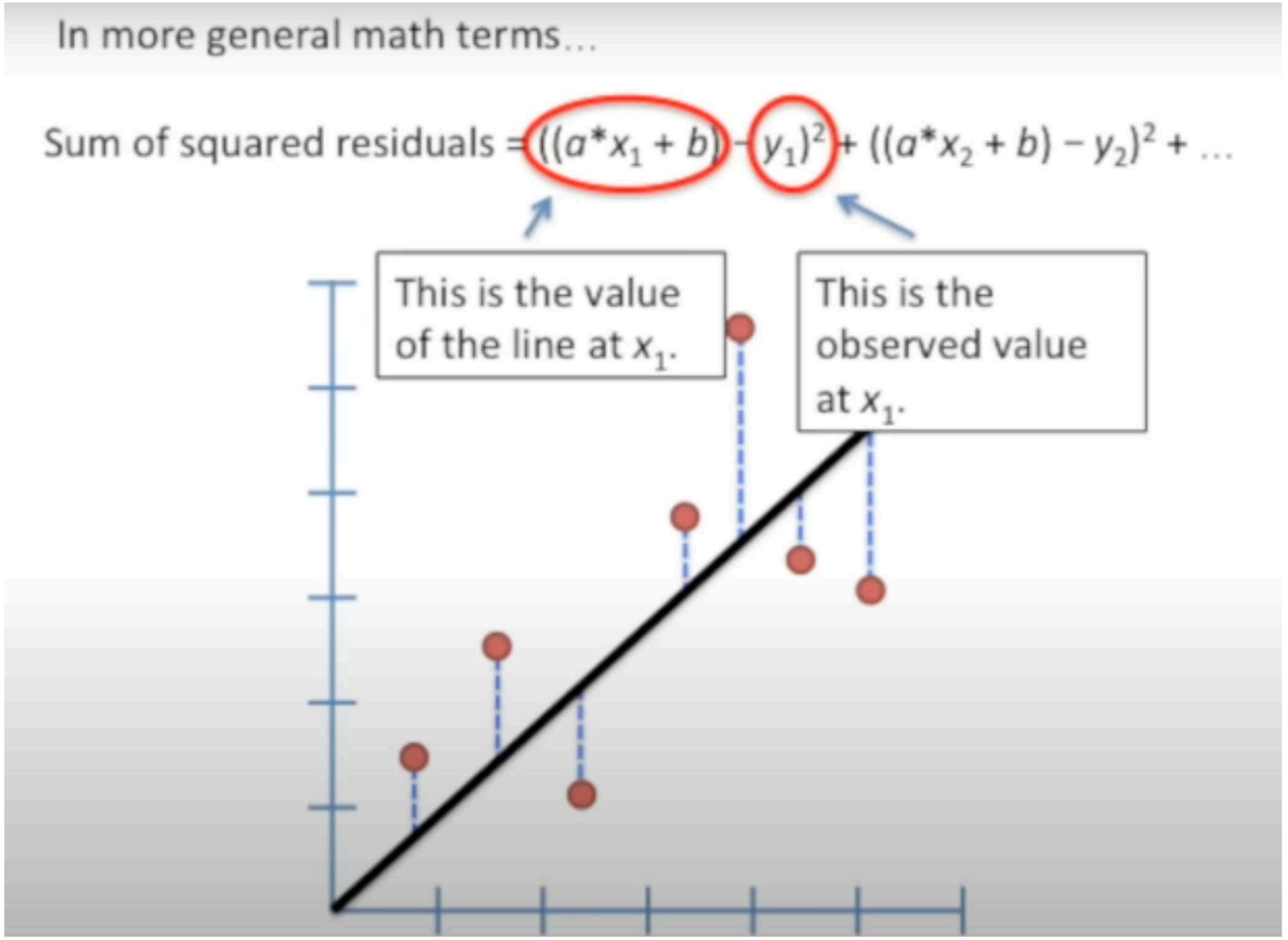

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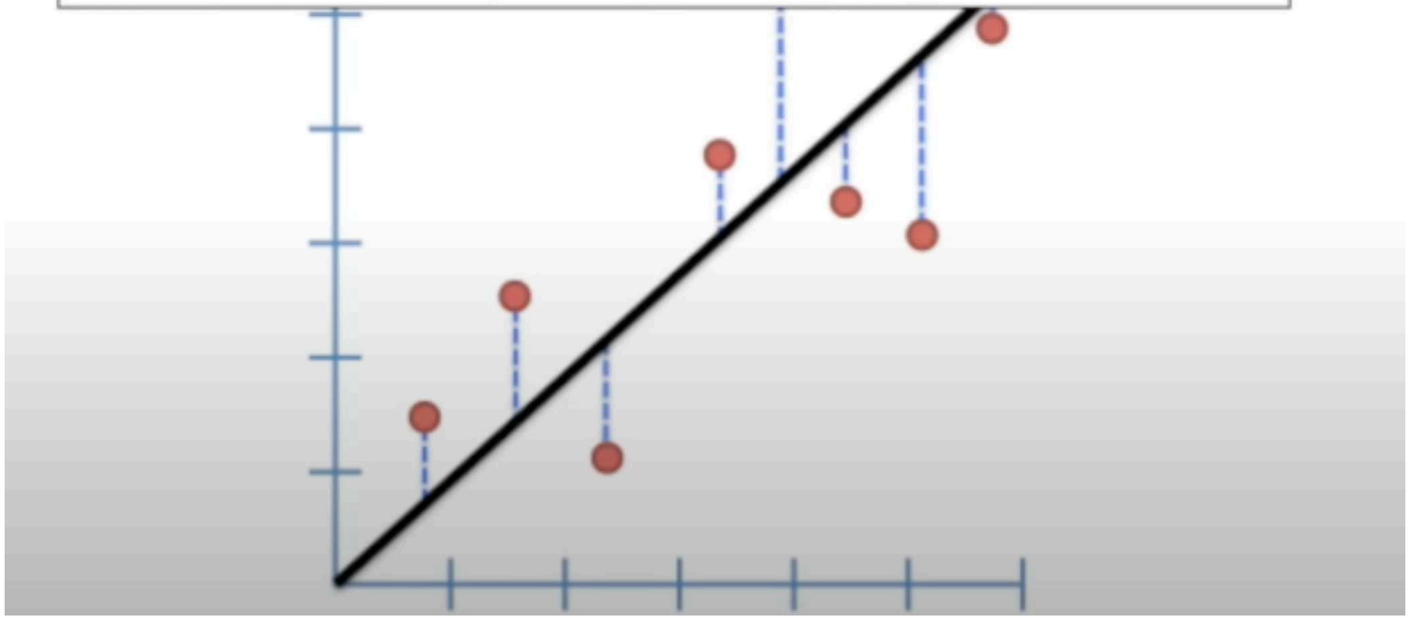
Linear Regression

In more general math terms…

Sum of squared residuals = $((a*x_1 + b) - y_1)^2 + ((a*x_2 + b) - y_2)^2 + \ldots$

Since we want the line that will give us the smallest sum of squares, this method for finding the best values for "*a*" and "*b*" is called "Least Squares".



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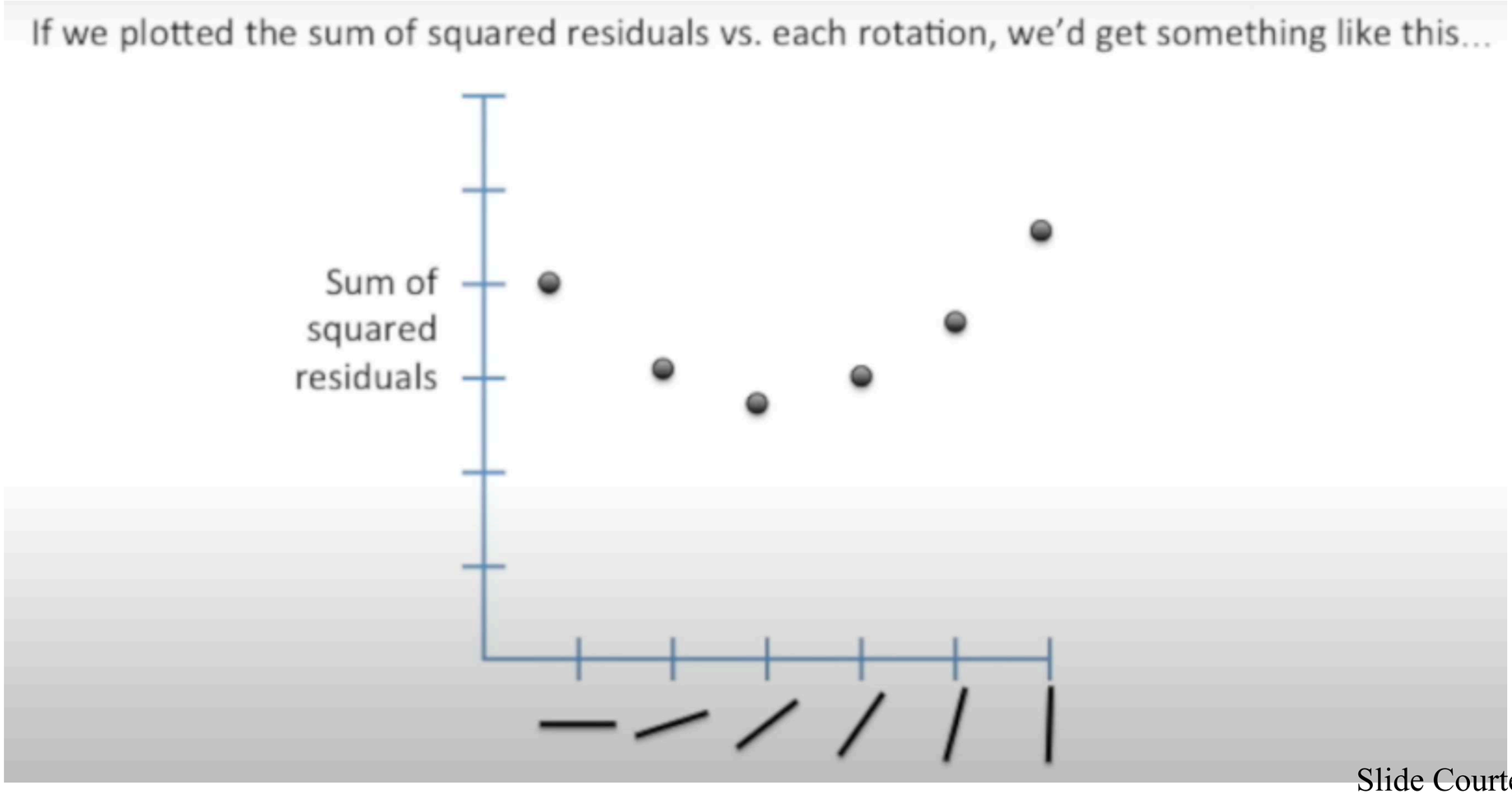

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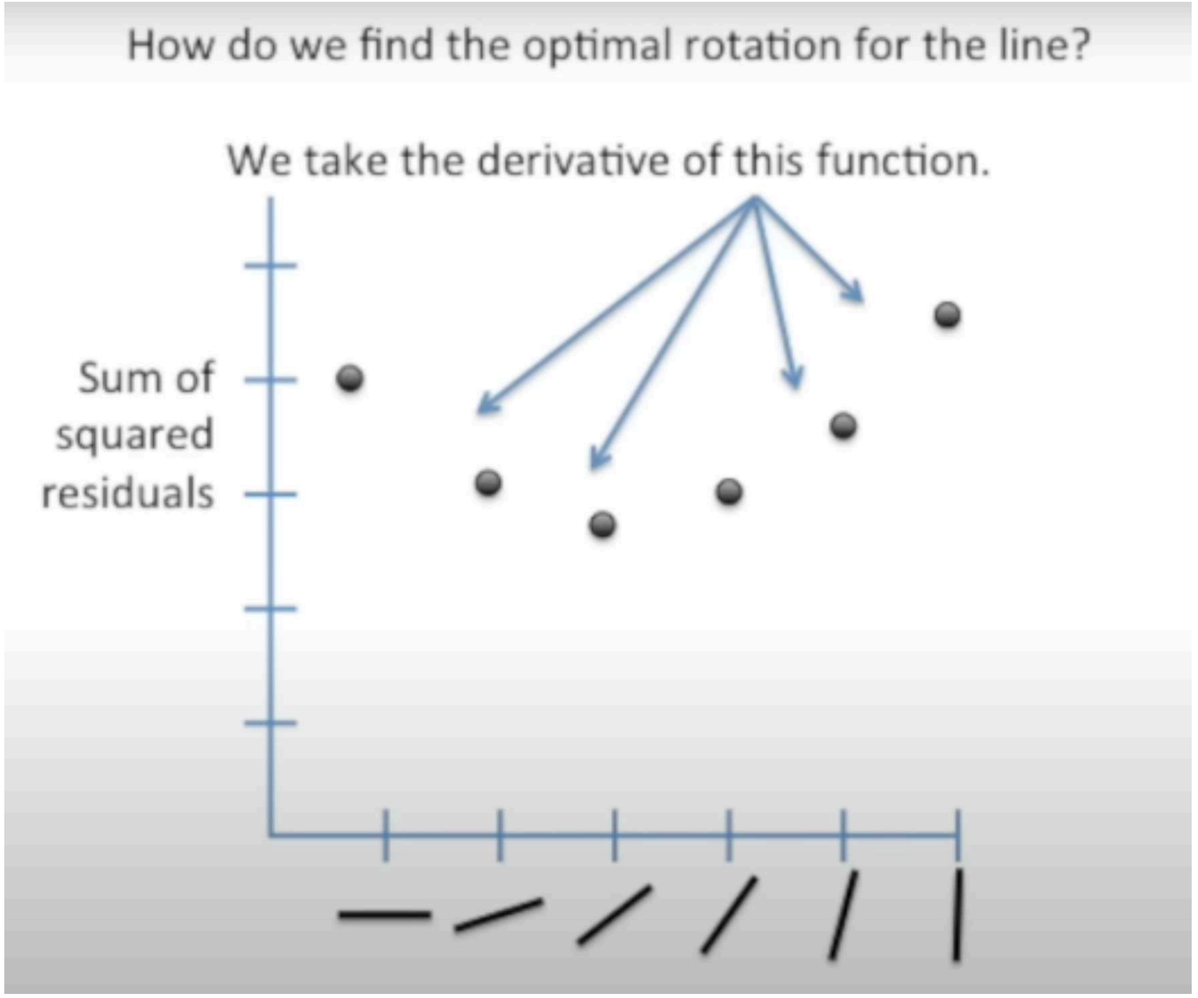

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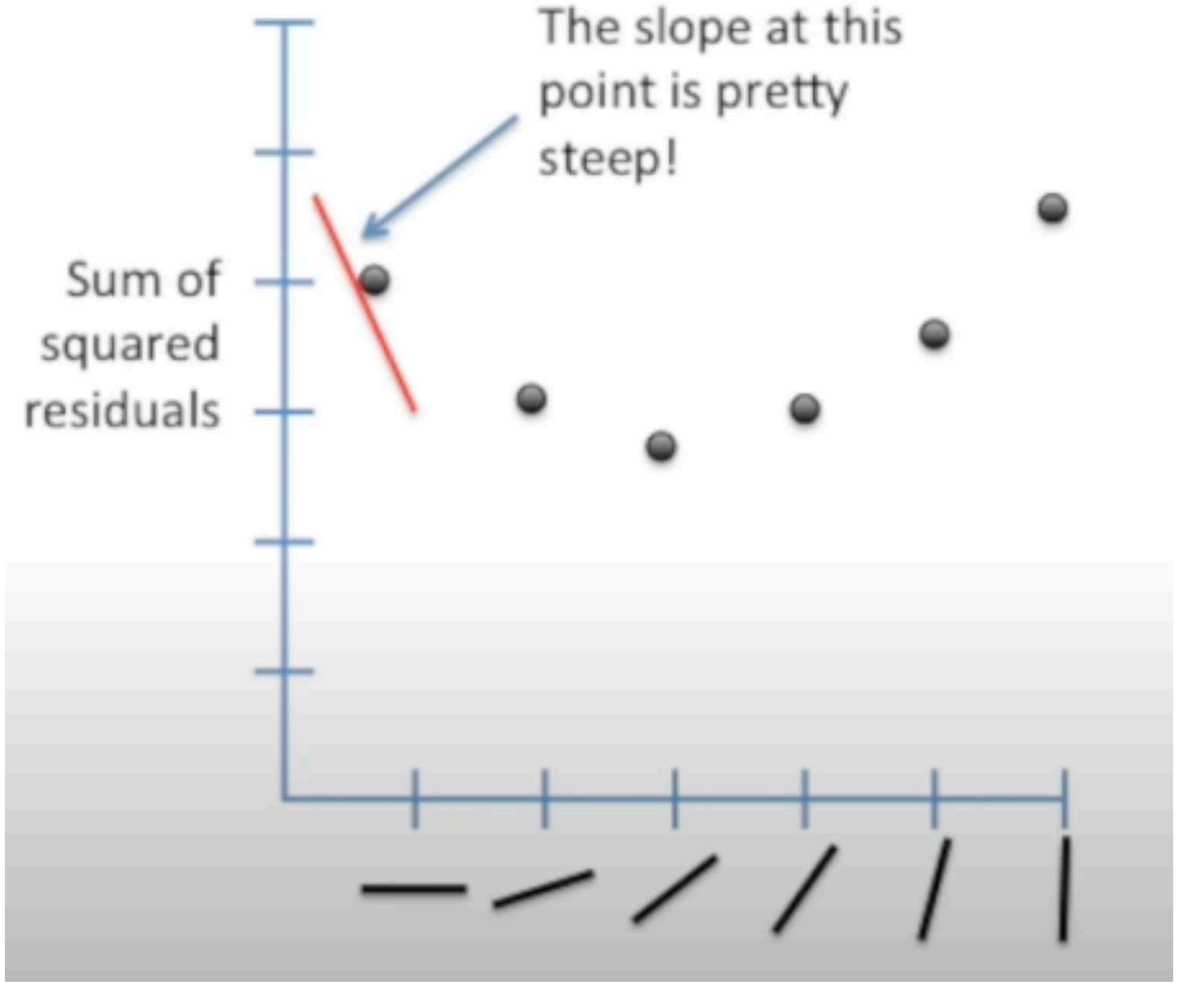

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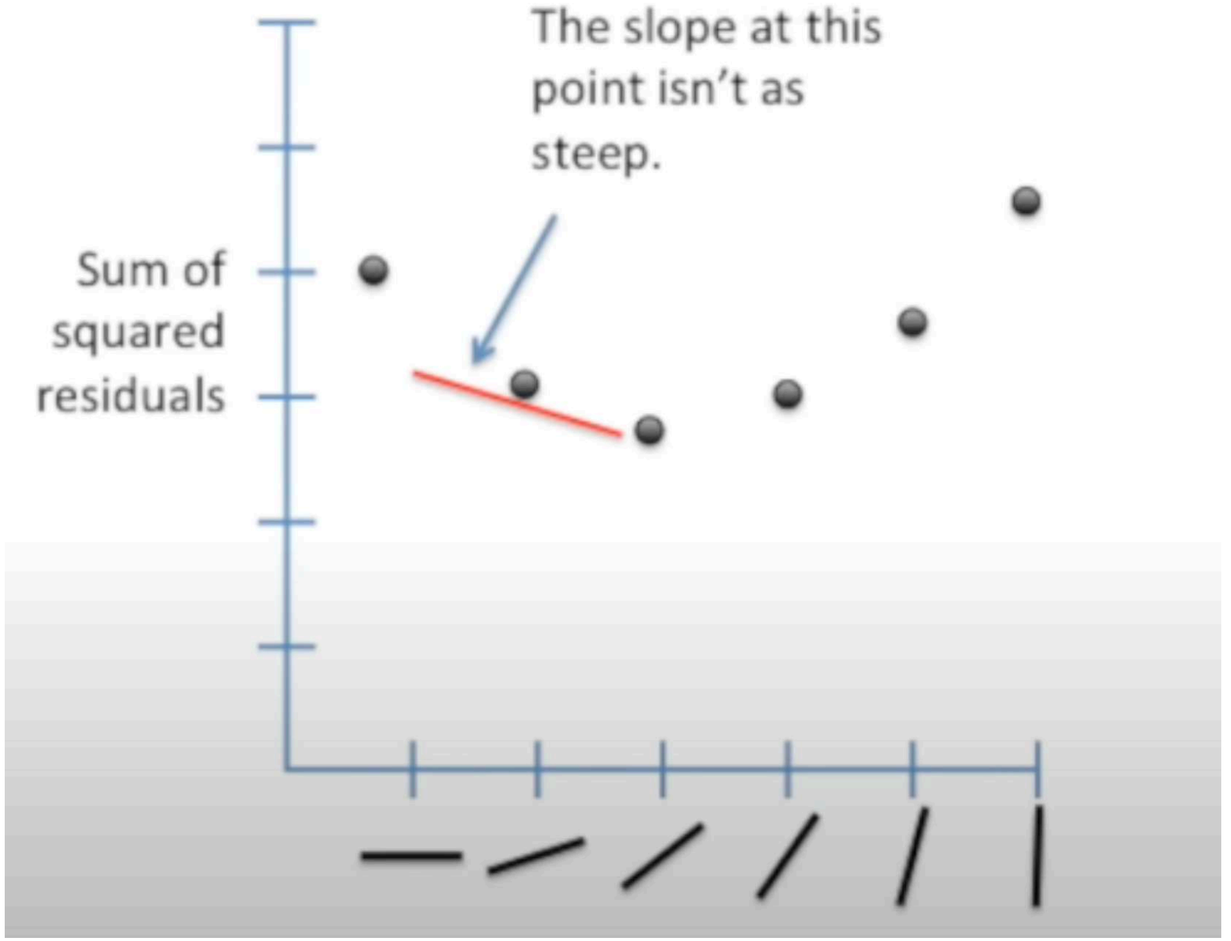

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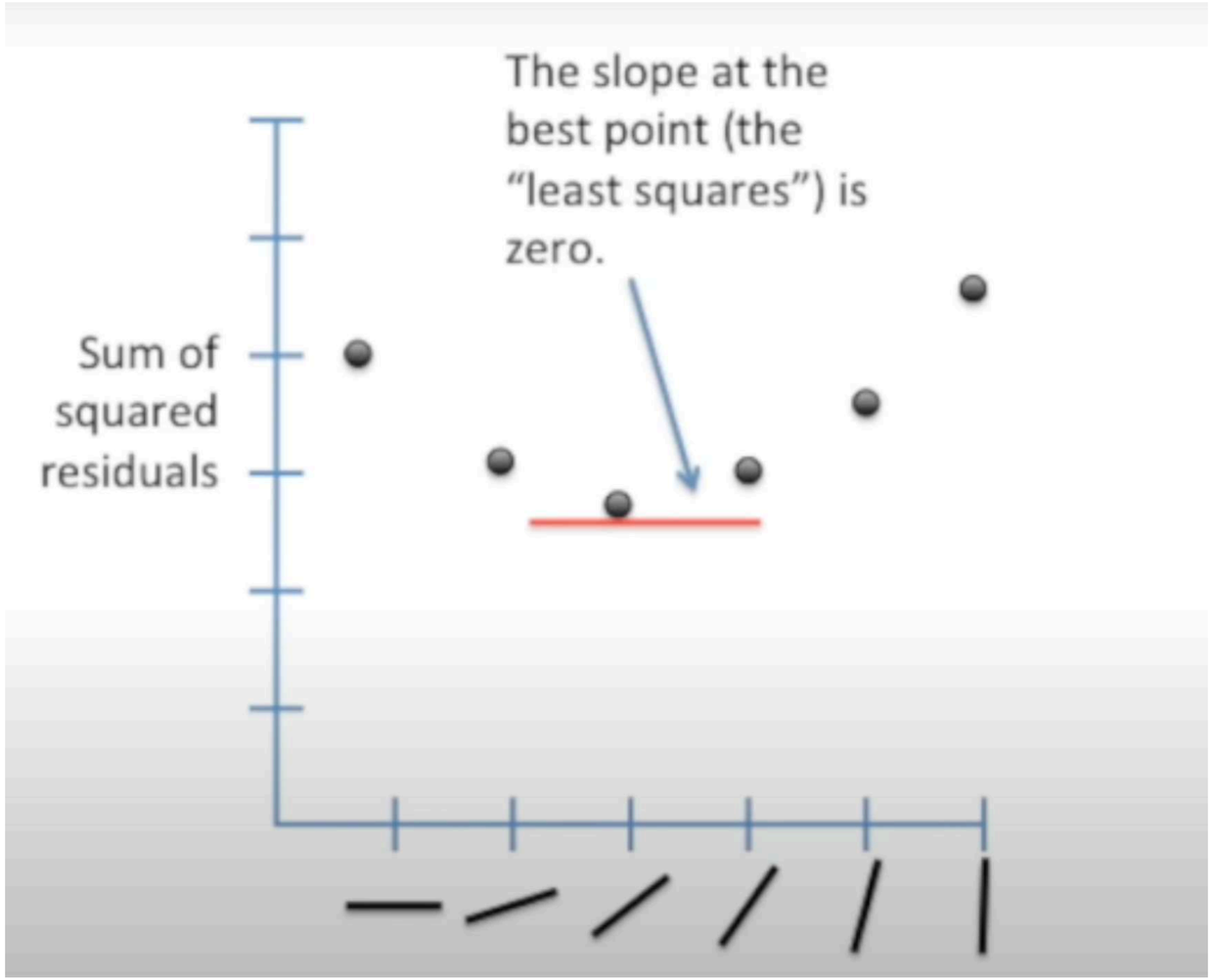

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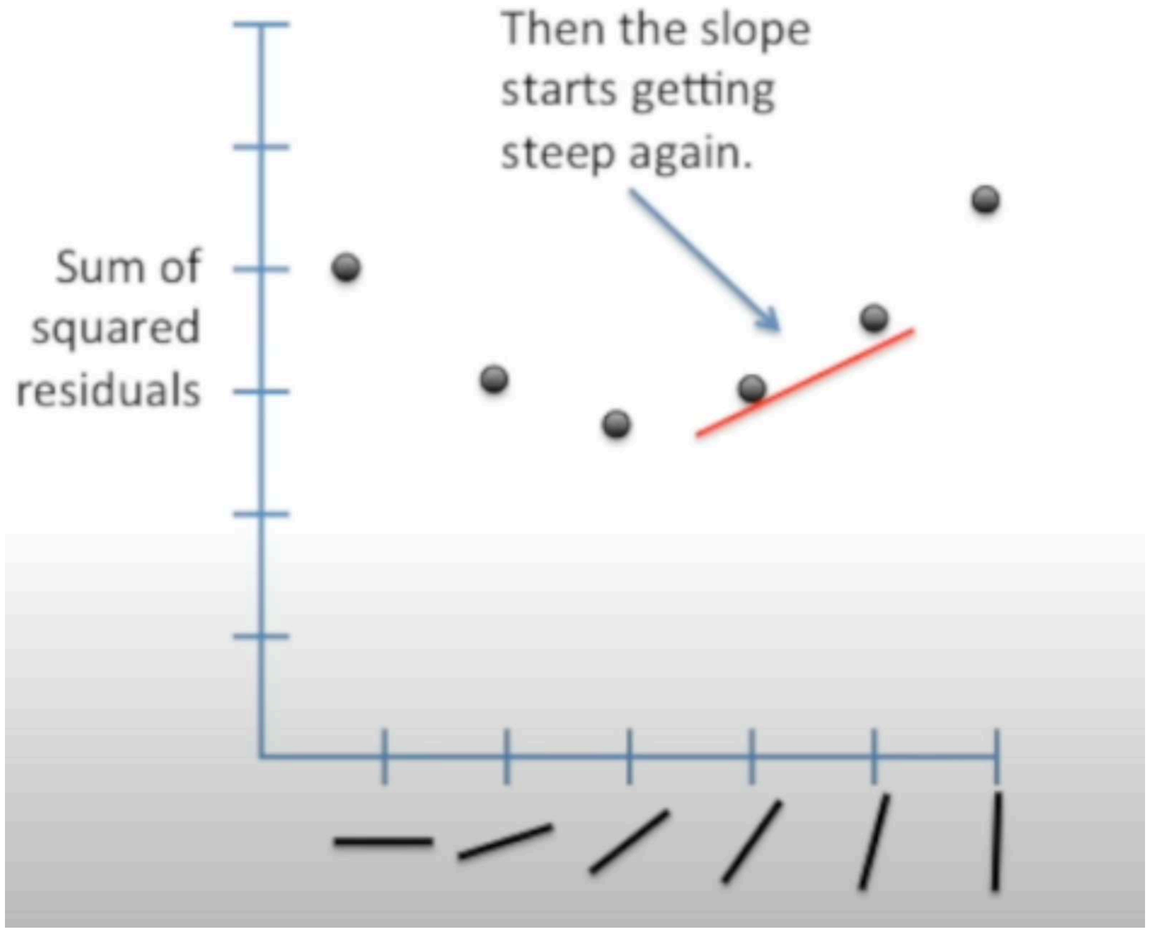

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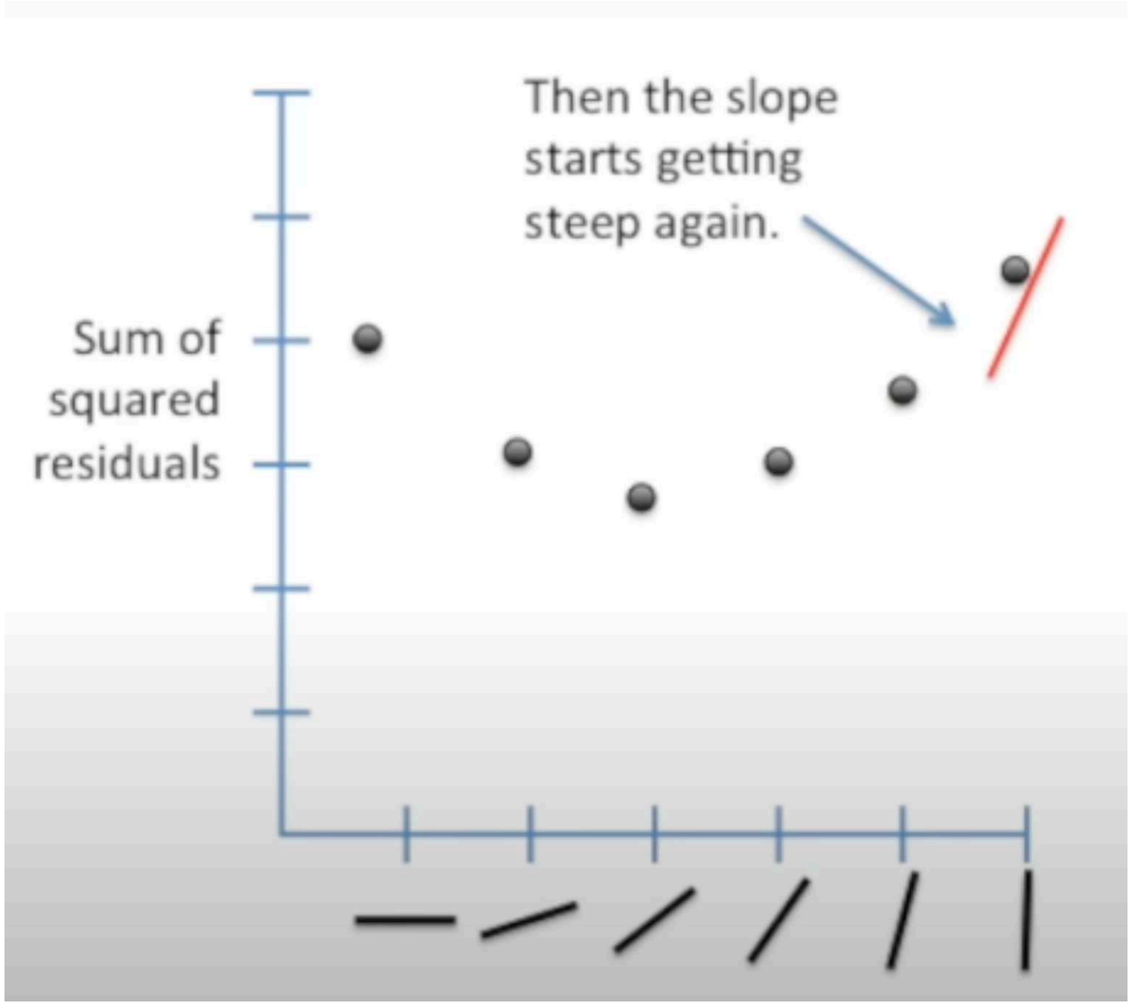

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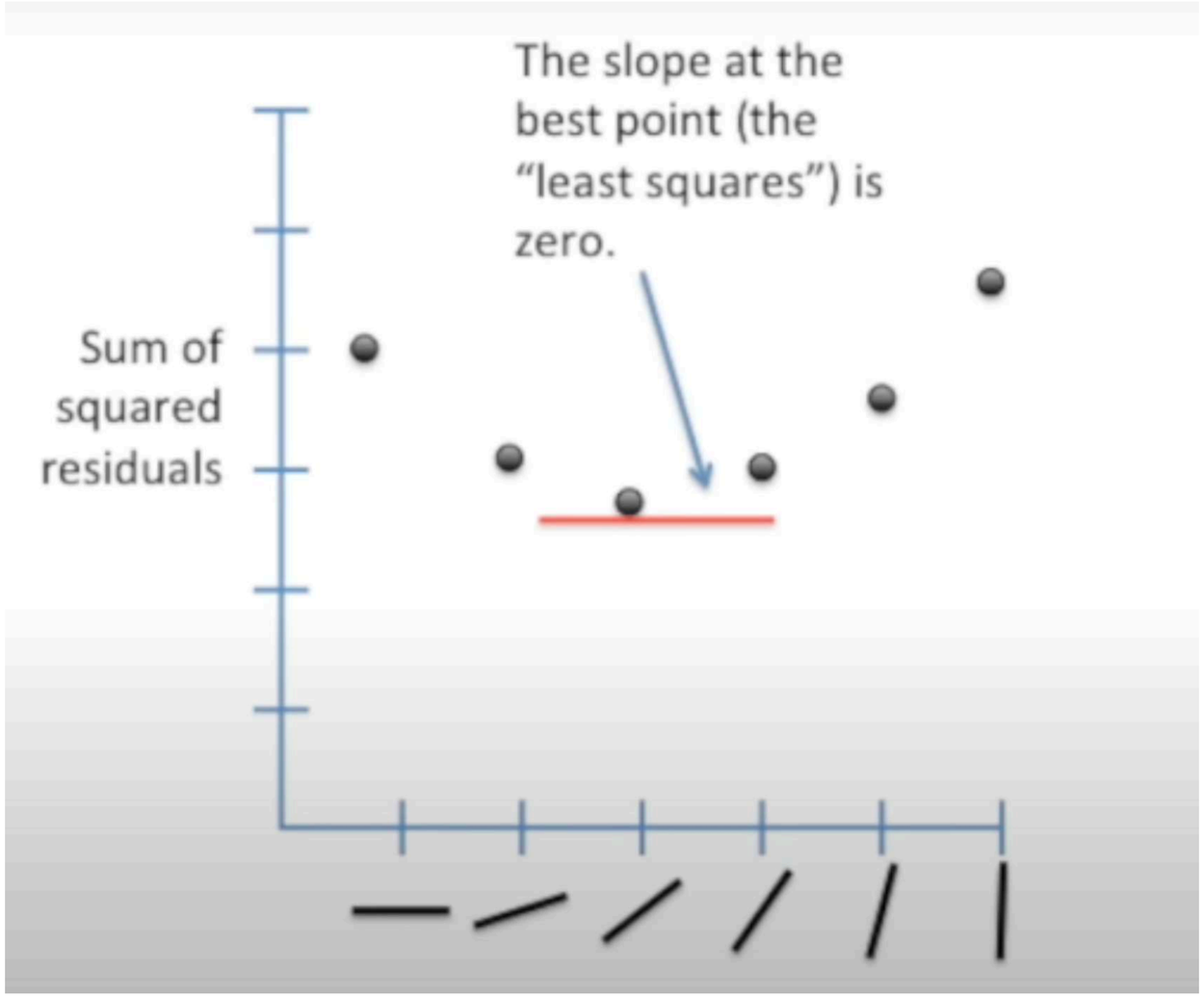

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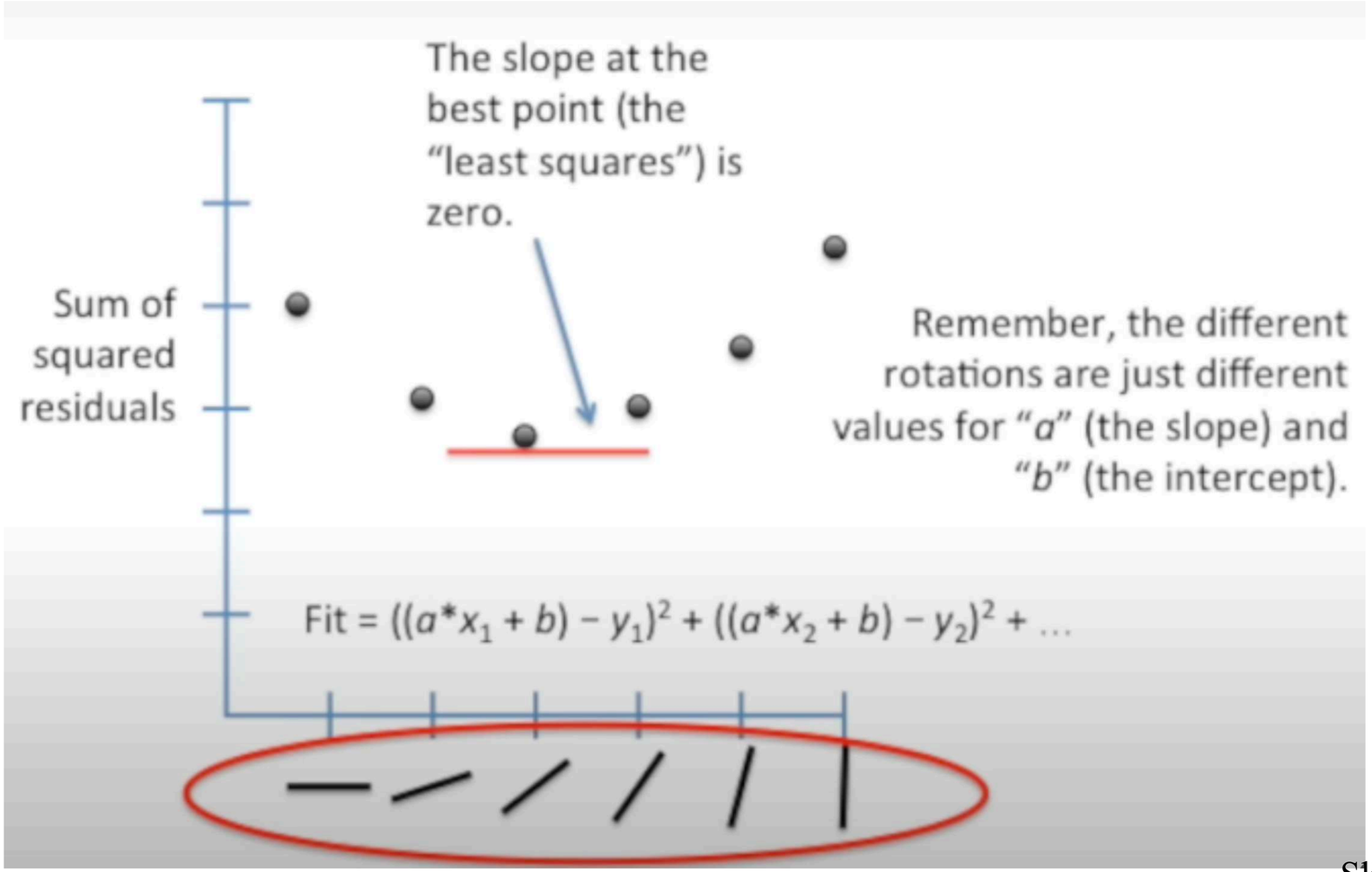

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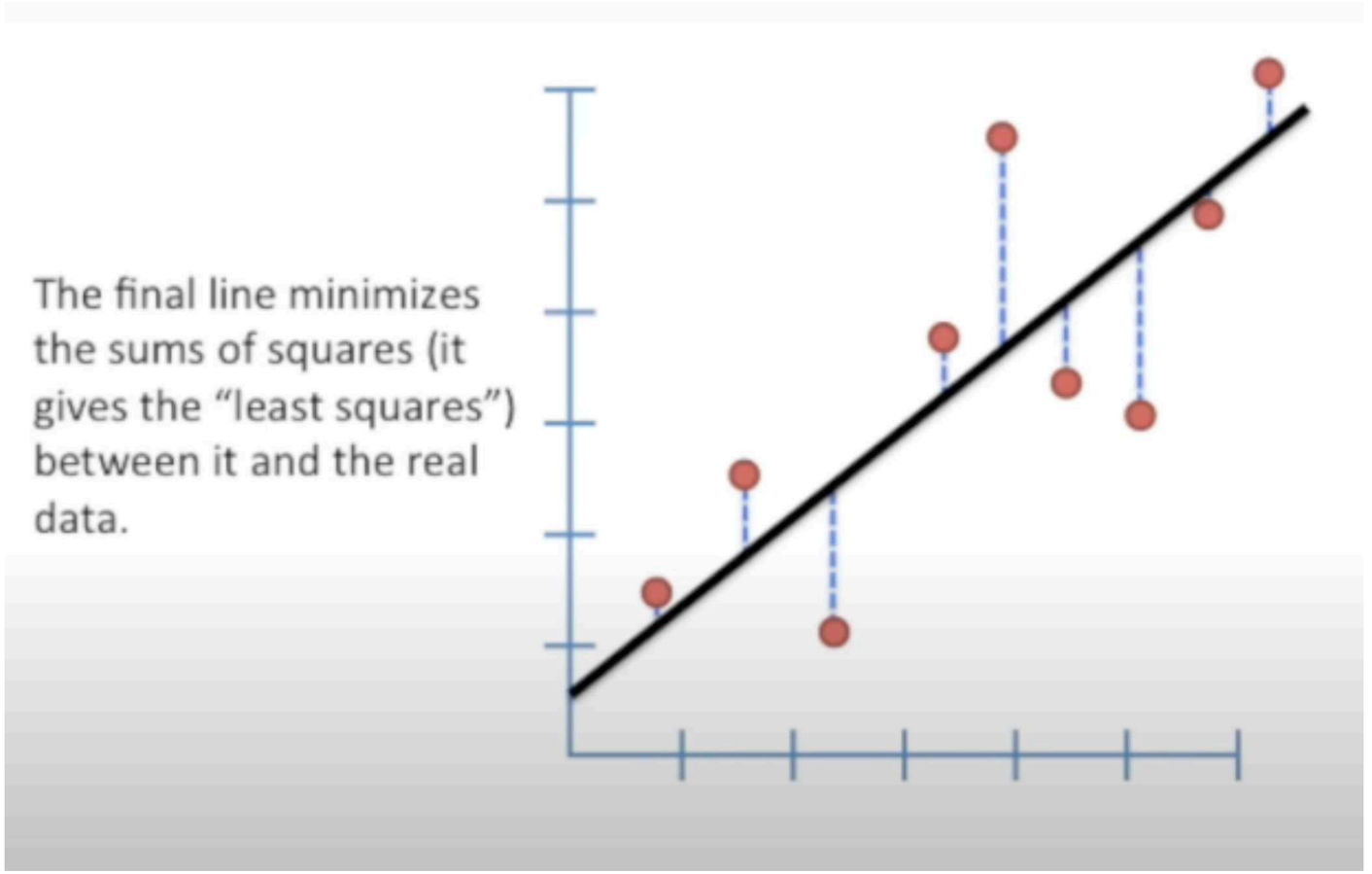

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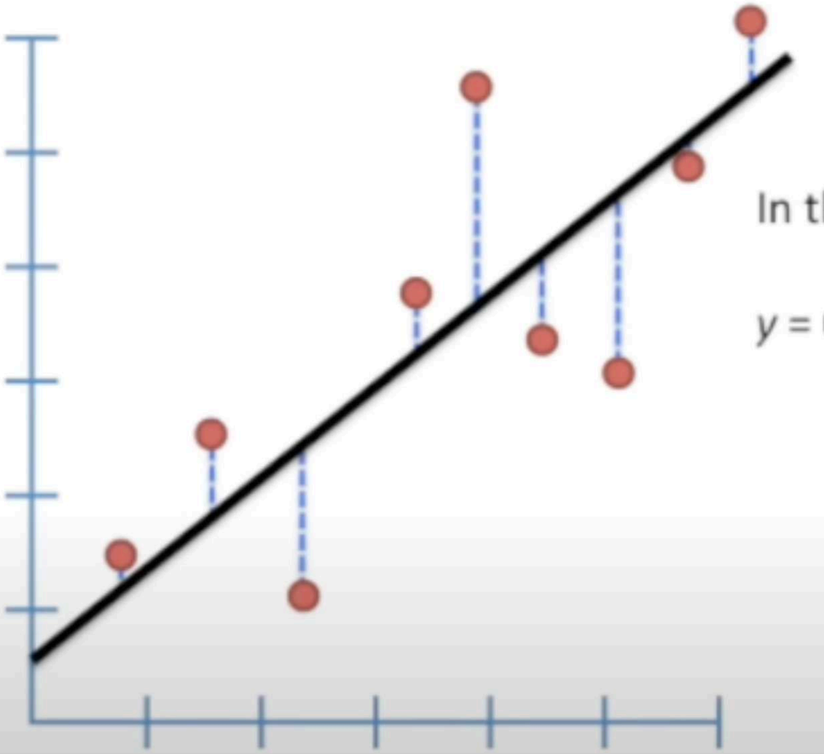
Linear Regression

The final line minimizes the sums of squares (it gives the "least squares") between it and the real data.



In this case, it is

$y = 0.77*x + 0.66$

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