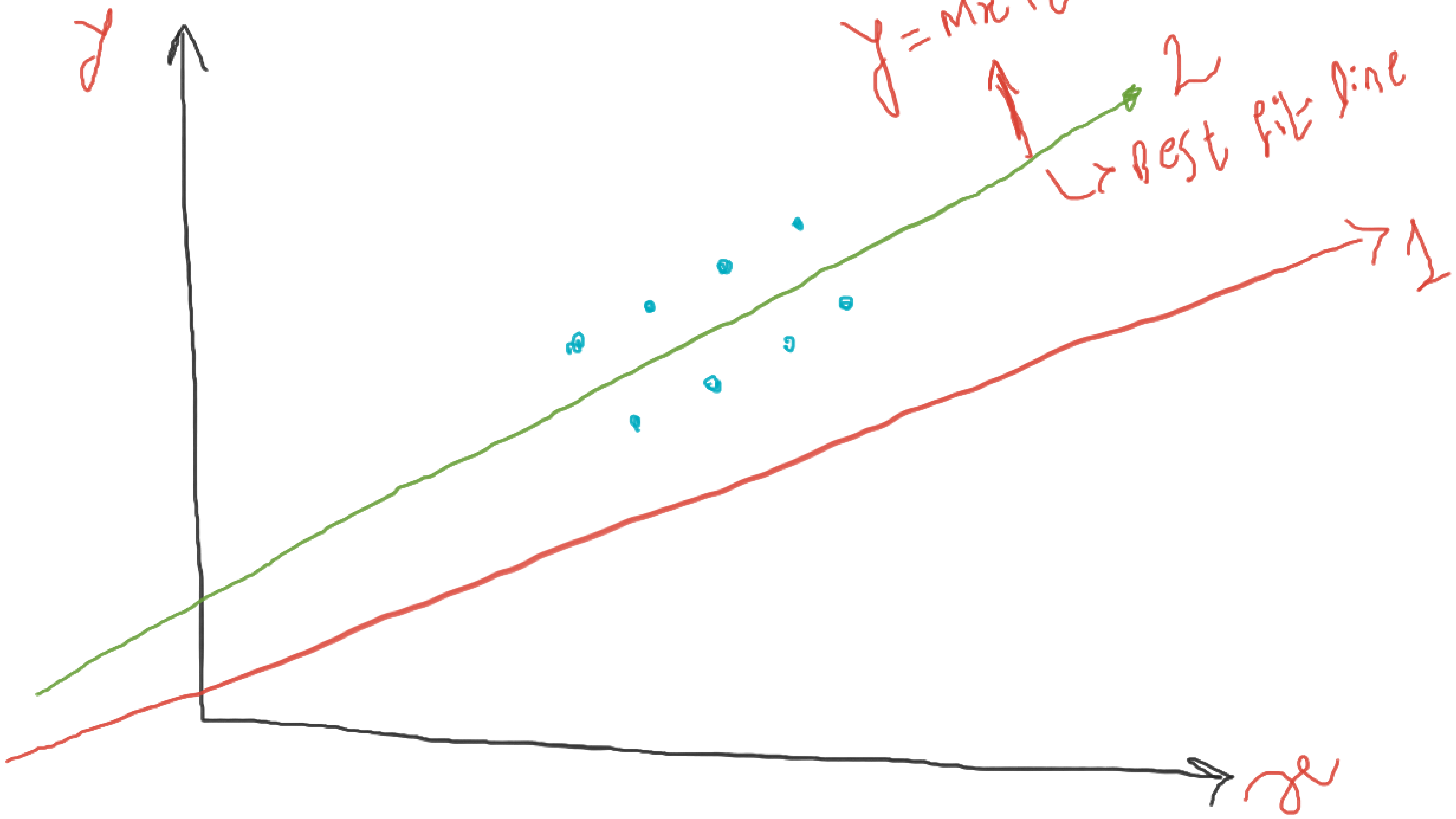
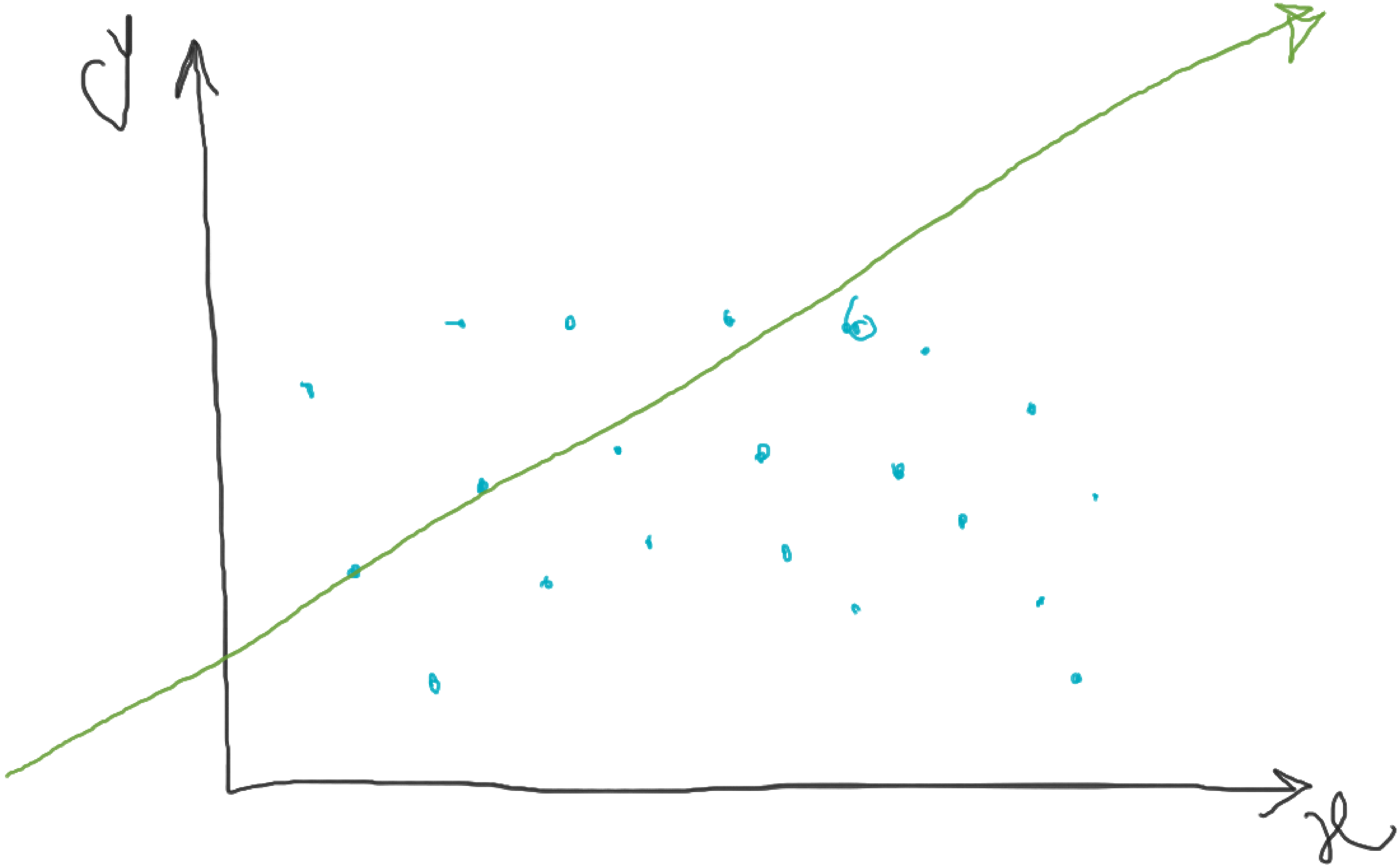
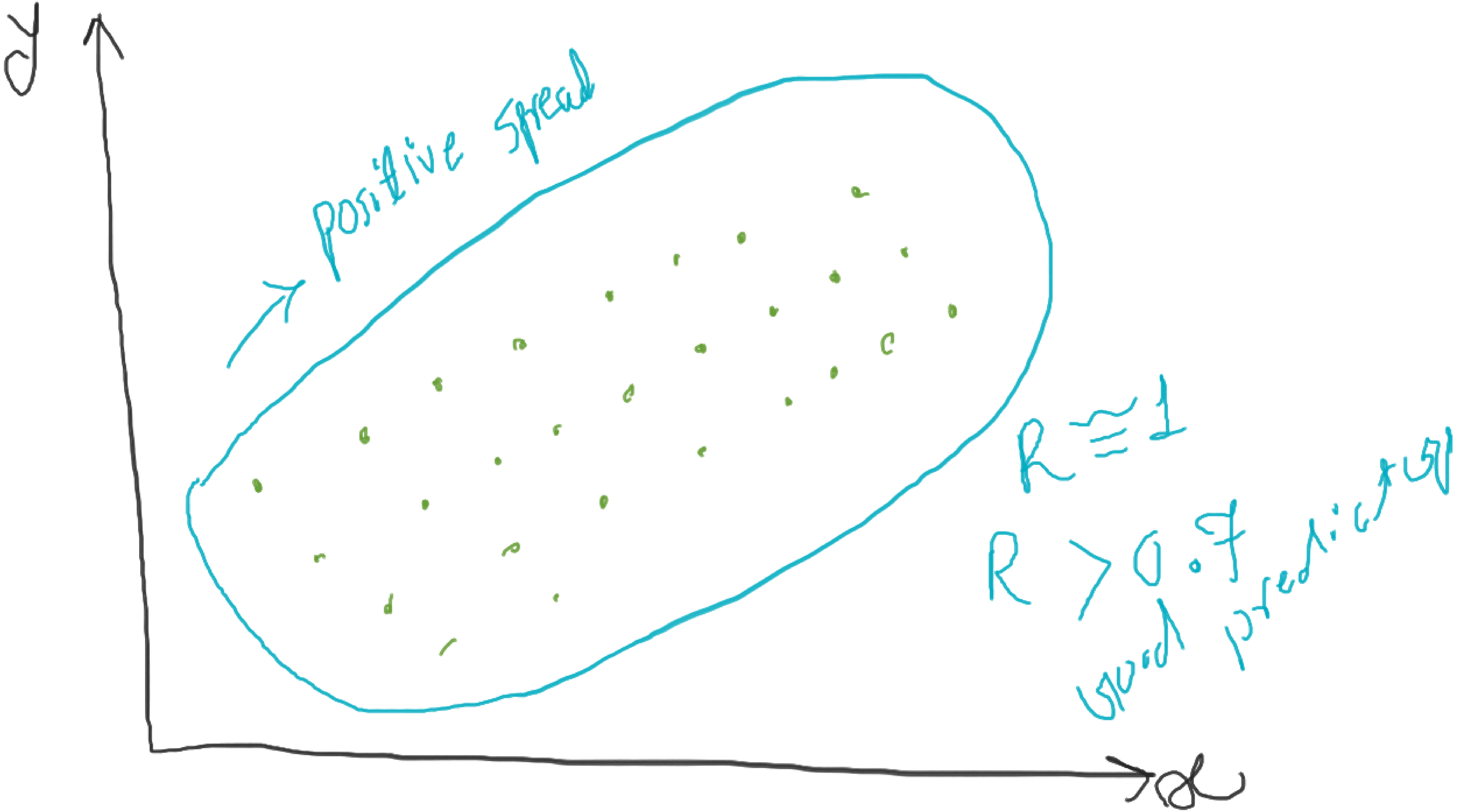
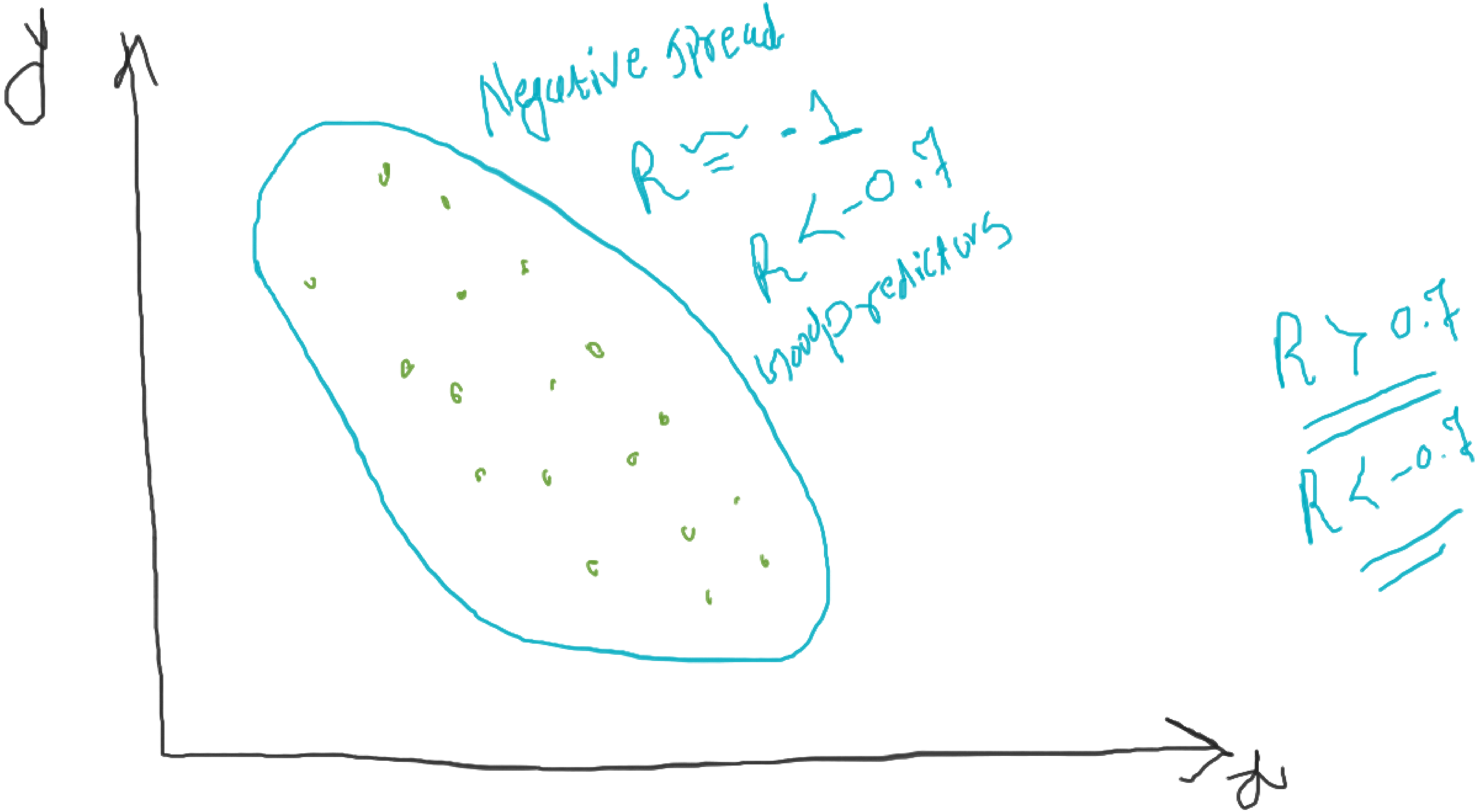


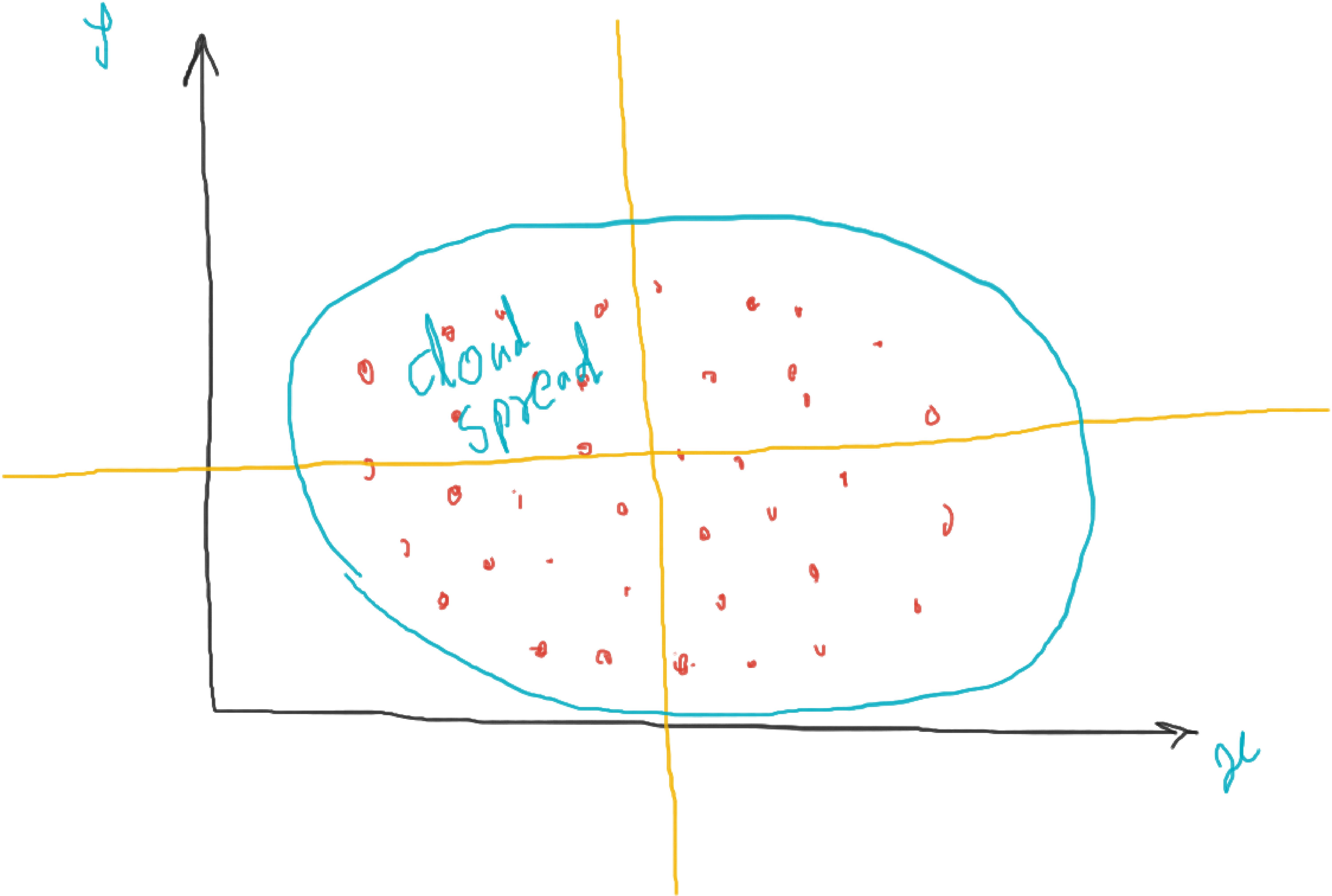
y
y = mx + c
2
Best fit line
1
x


y
x



y
positive spread
R ≅ 1
R > 0.7
good predictor
x

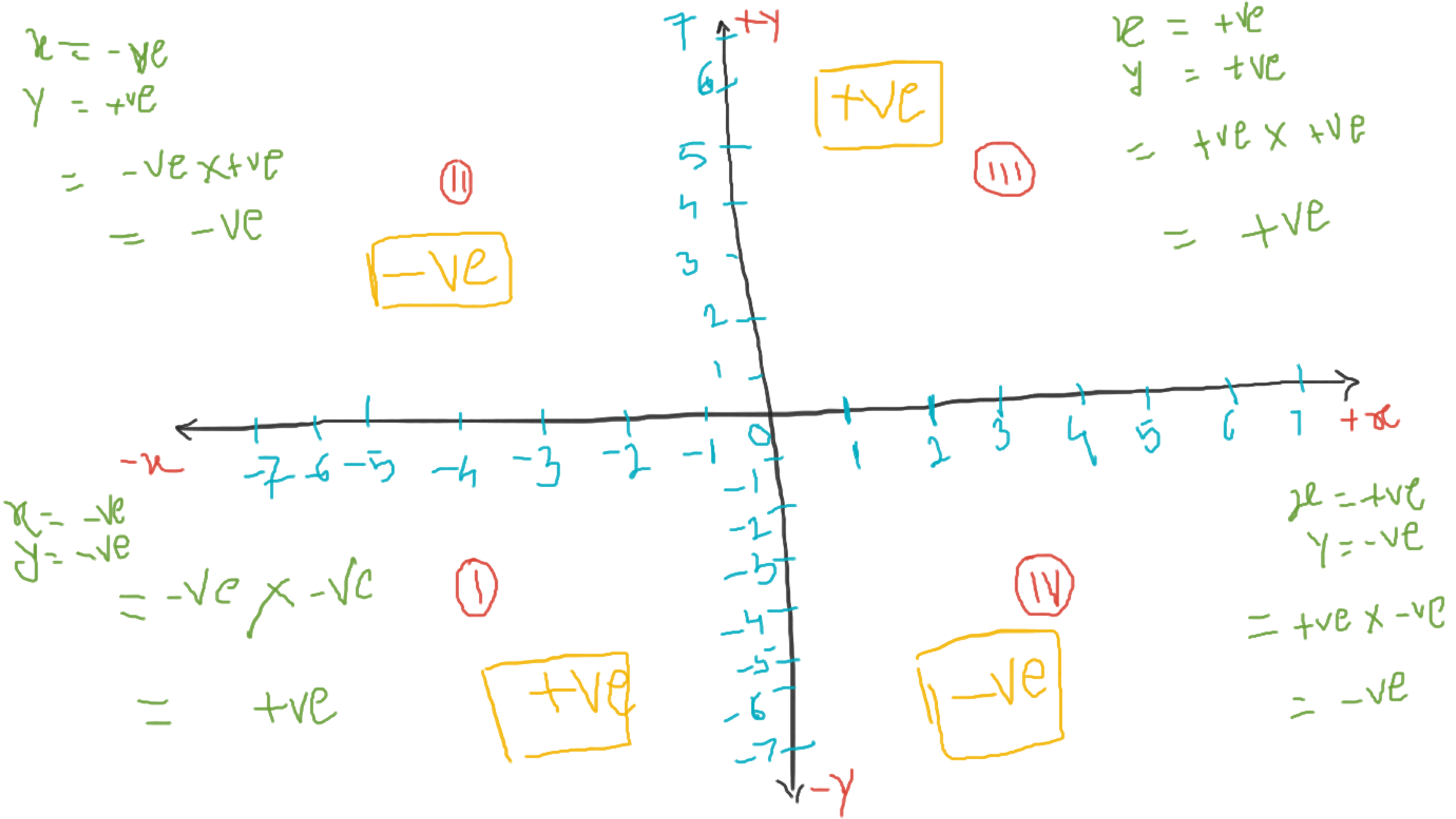

y
x
Negative spread
R ≅ -1
R < -0.7
good predictors
R > 0.7
R < -0.7


y
cloud spread
x

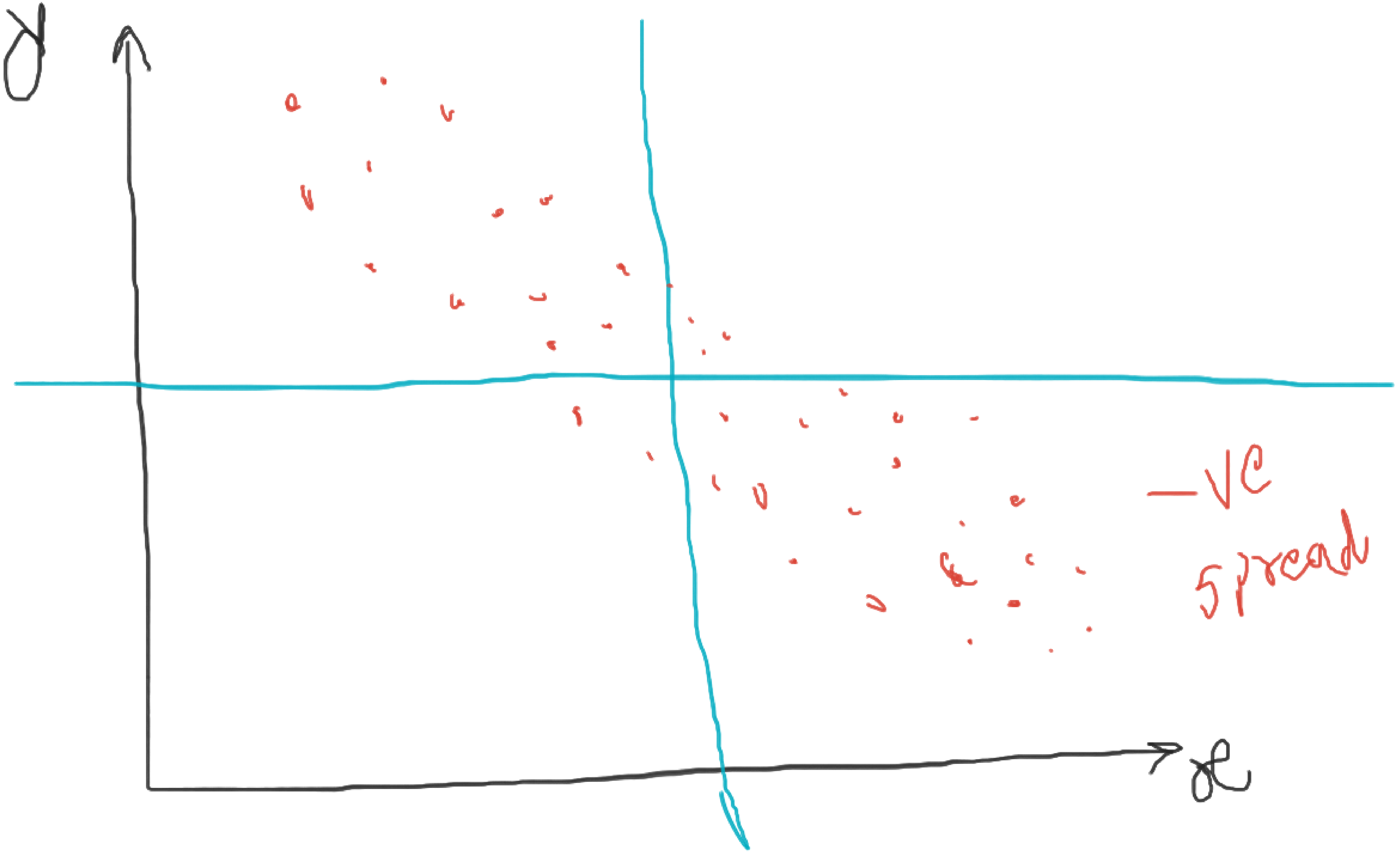
Coefficient of correlation :- (R) =

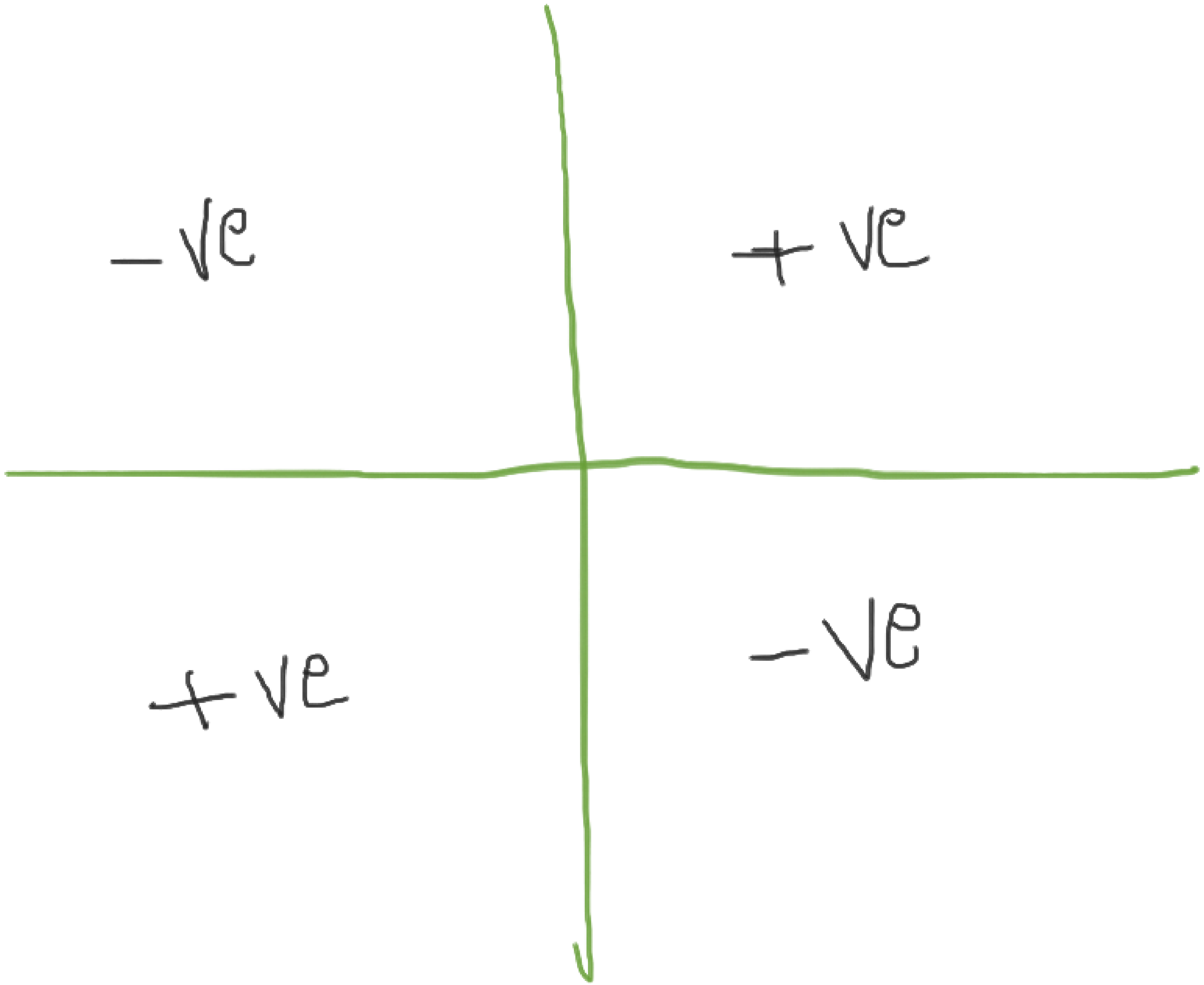
$$r_{xy} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \cdot \sum (y_i - \bar{y})^2}}$$


+ve
spread

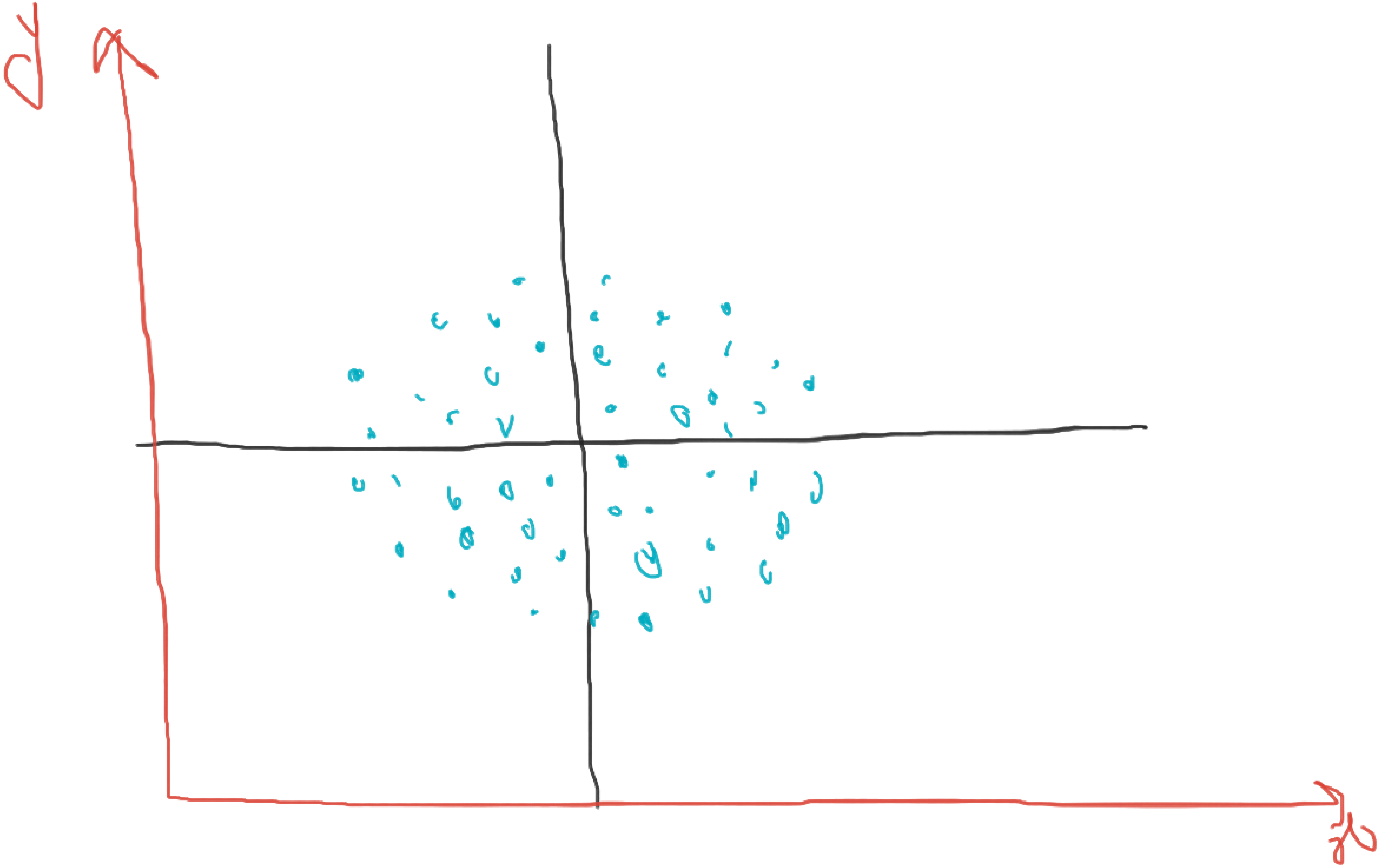


x = -ve
y = +ve
= -ve x +ve
= -ve
II
-ve
x = +ve
y = +ve
= +ve x +ve
= +ve
III
+ve
+y
-y
+x
-x
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
x = -ve
y = -ve
= -ve x -ve
= +ve
I
+ve
x = +ve
y = -ve
= +ve x -ve
= -ve
IV
-ve


y
x
-ve
spread



-ve
+ve
+ve
-ve


y
x

Coefficient of Correlation	r_{xy}	R	Pearson Coefficient of Correlation

$$\text{Covarriance} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{n-1}$$

$$\text{Std} = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \cdot \sqrt{\frac{\sum (y_i - \bar{y})^2}{n-1}}$$

$$\text{Std} = \sqrt{\sum (x_i - \bar{x})^2 \cdot \sum (y_i - \bar{y})^2} \Big/ n-1$$

$$r_{xy} = \frac{\text{Covariance}}{\text{Std}}$$

$$= \frac{\dfrac{\sum(x_i-\bar{x})\cdot(y_i-\bar{y})}{n-1}}{\sqrt{\dfrac{\sum(x_i-\bar{x})^2\cdot\sum(y_i-\bar{y})^2}{n-1}}}$$

$$r_{xy} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \cdot \sum (y_i - \bar{y})^2}} = \frac{\text{Covariance}}{\text{Std}}$$