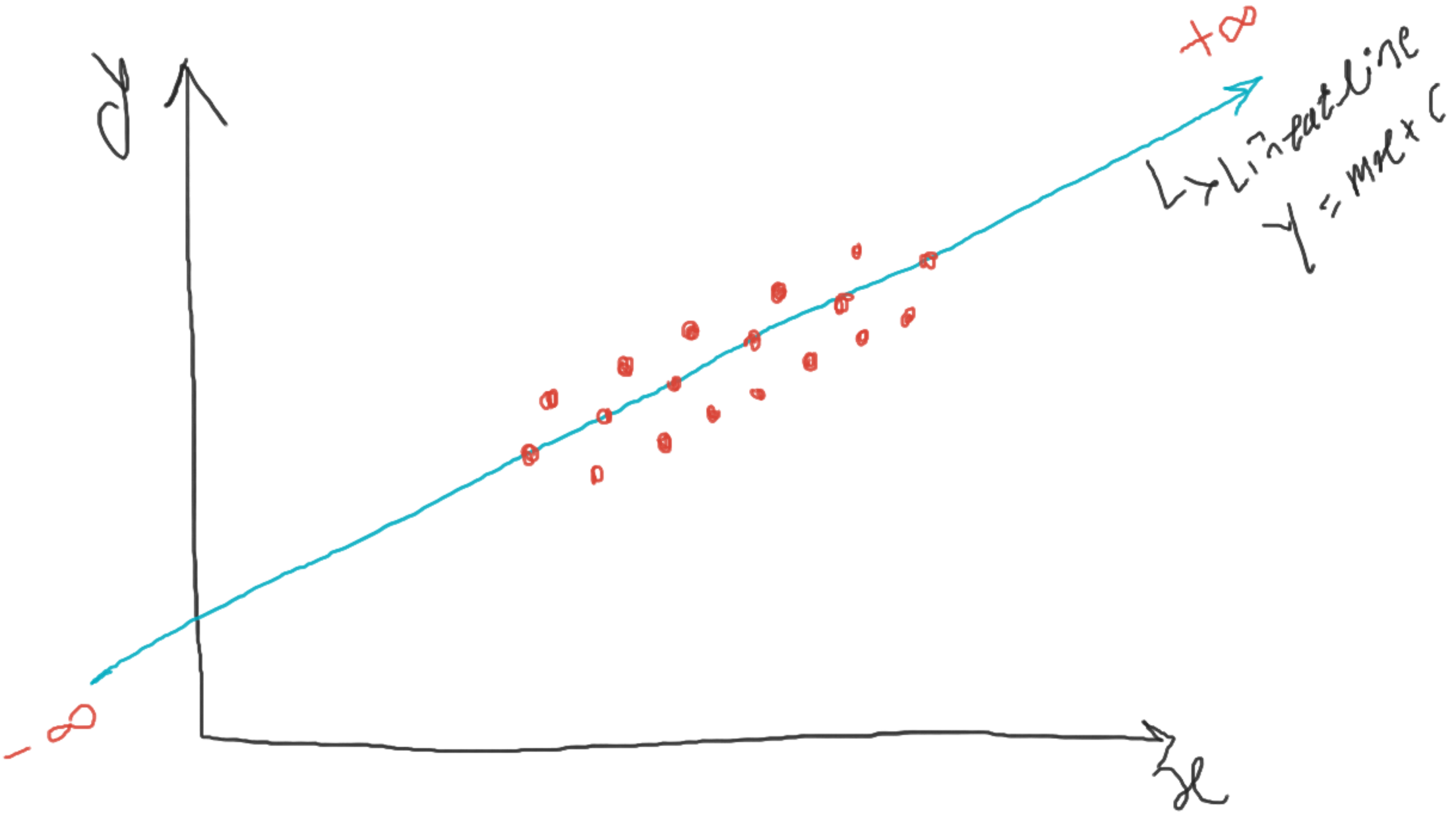
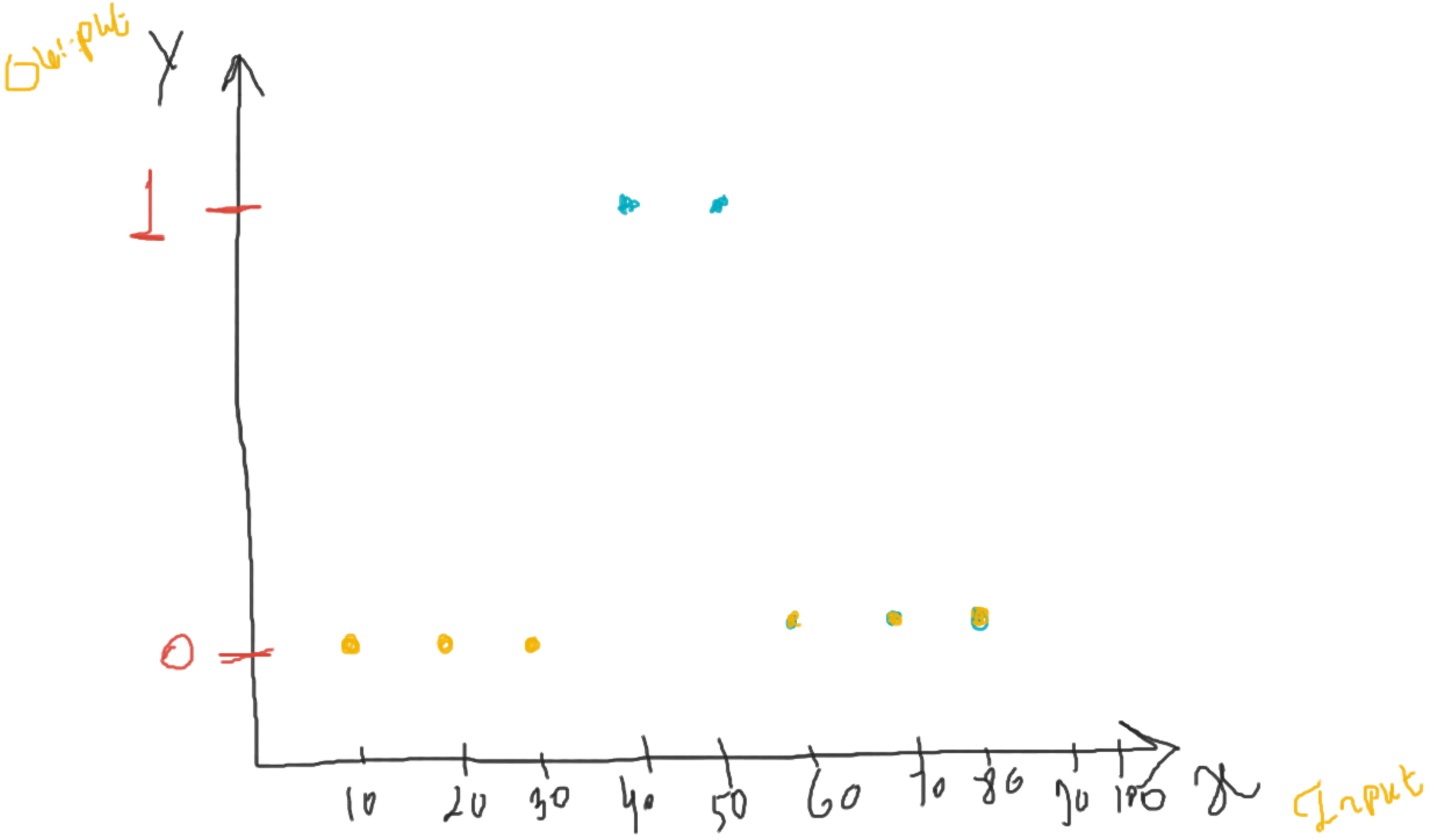
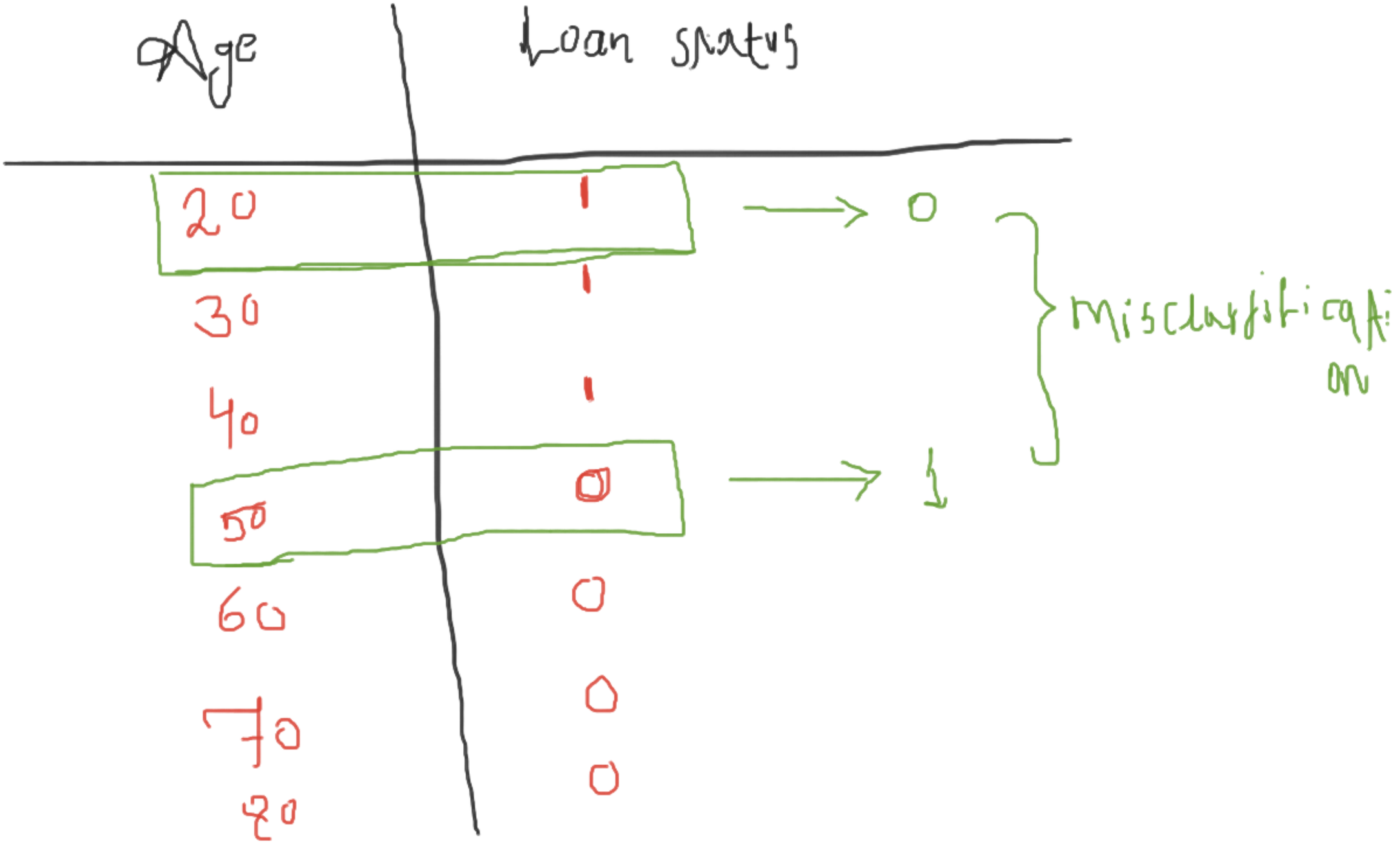
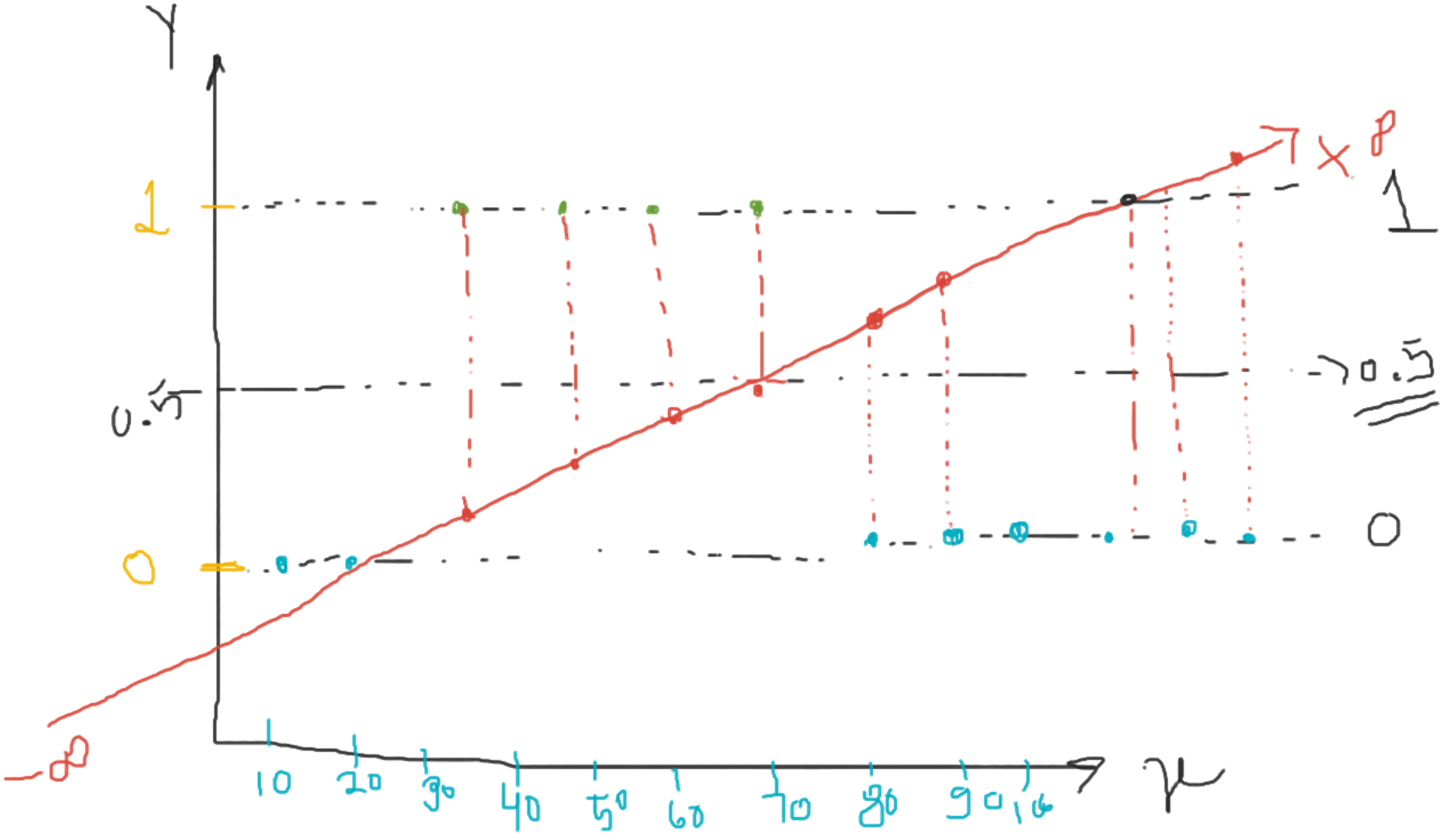
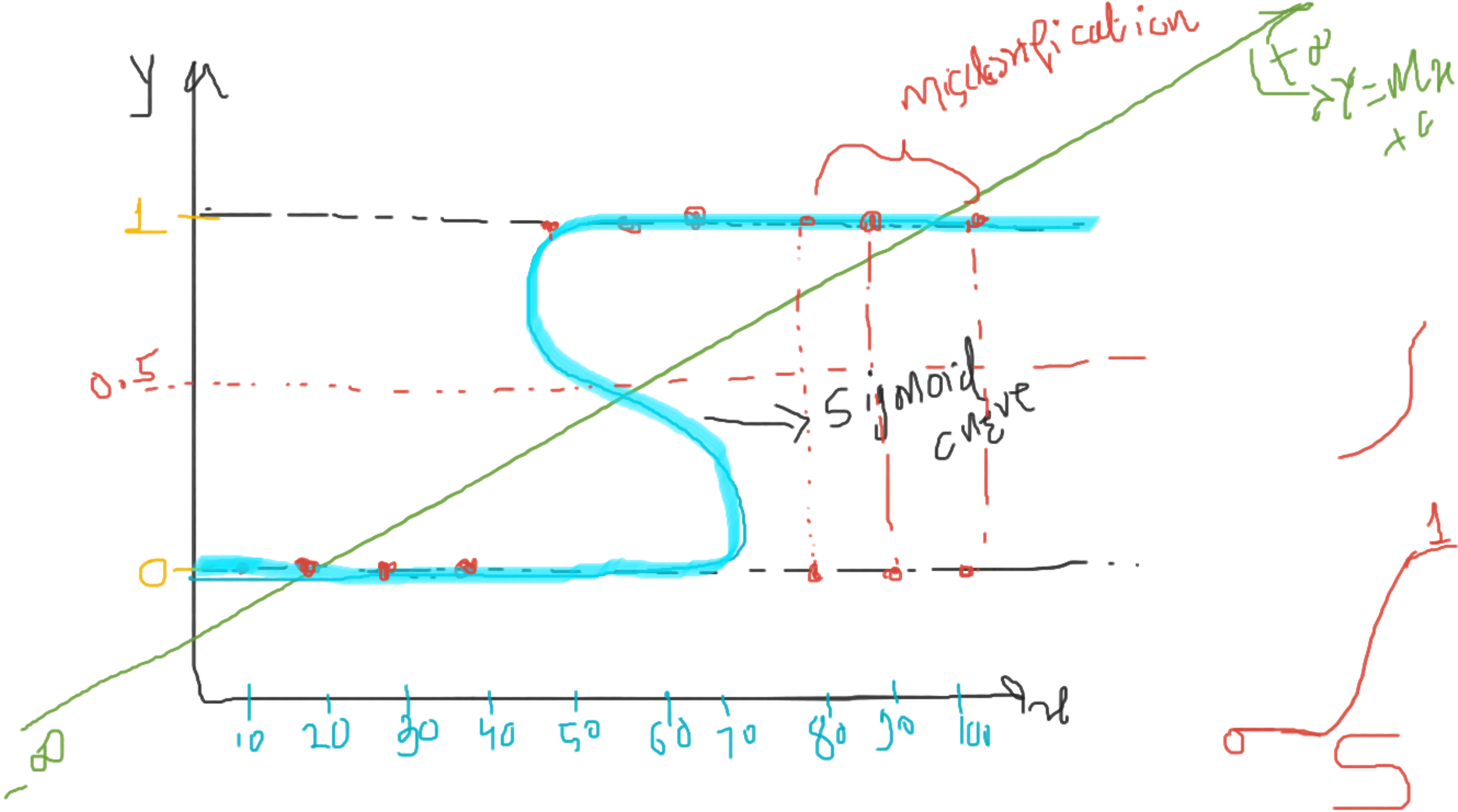

y
+∞
Linear line
y = mx + c
-∞
x


Output
Y
1
0
10
20
30
40
50
60
70
80
90
100
X
Input


Age
Loan status
20
30
40
50
60
70
80
1
1
1
0
0
0
0
0
misclassification


Y
1
0.5
0
-∞
10
20
30
40
50
60
70
80
90
100
X
P
1
0.5
0



y
1
0.5
0
10
20
30
40
50
60
70
80
90
100
x
misclassification
sigmoid curve

$$y = mx + c$$

$$P(y) = \frac{1}{1 + e^{-y}}$$

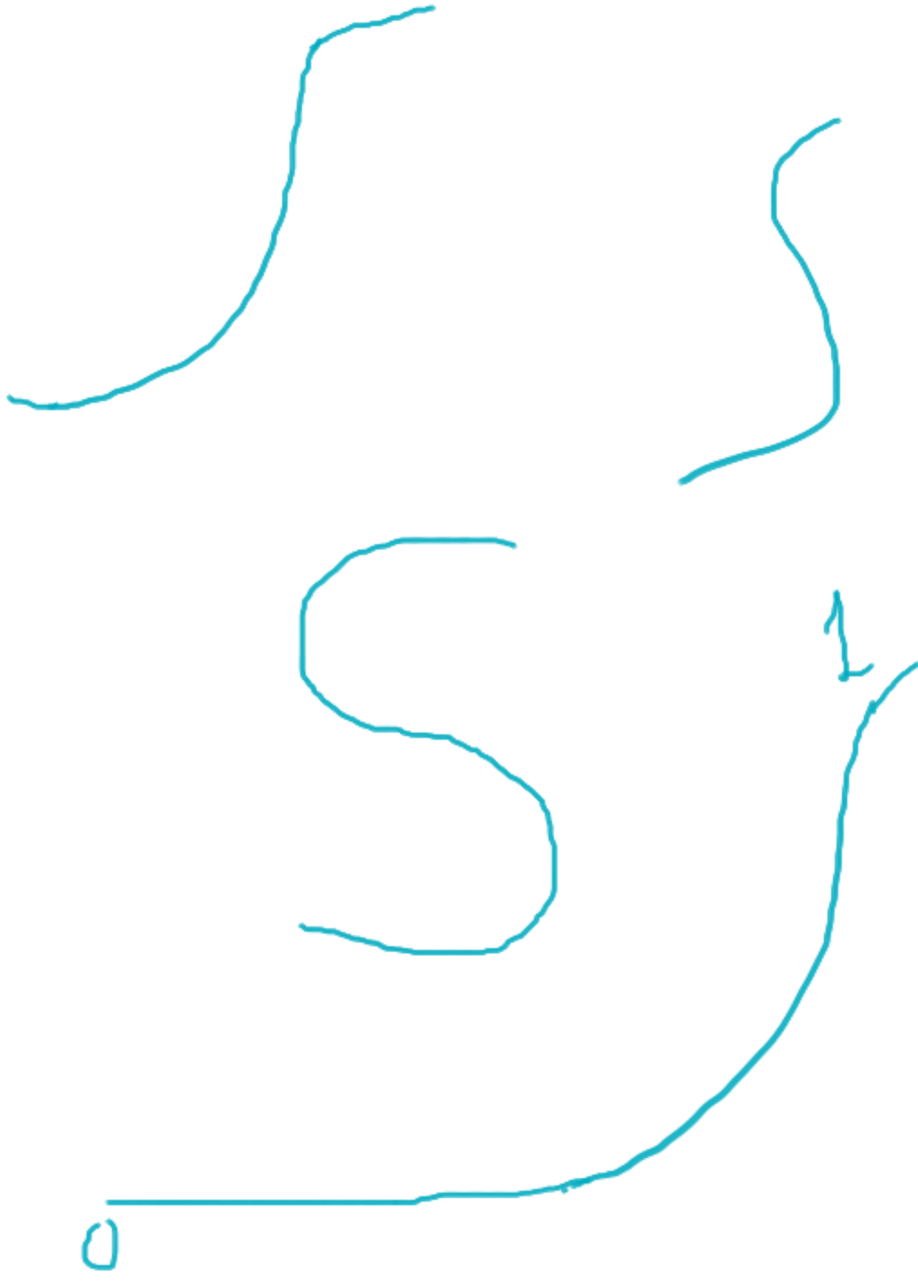
$e : 2.718$

$$P(y) = \frac{1}{1 + e^{-(mx + c)}}$$

$= 0$ to 1

P(Y=1), 5 ✓

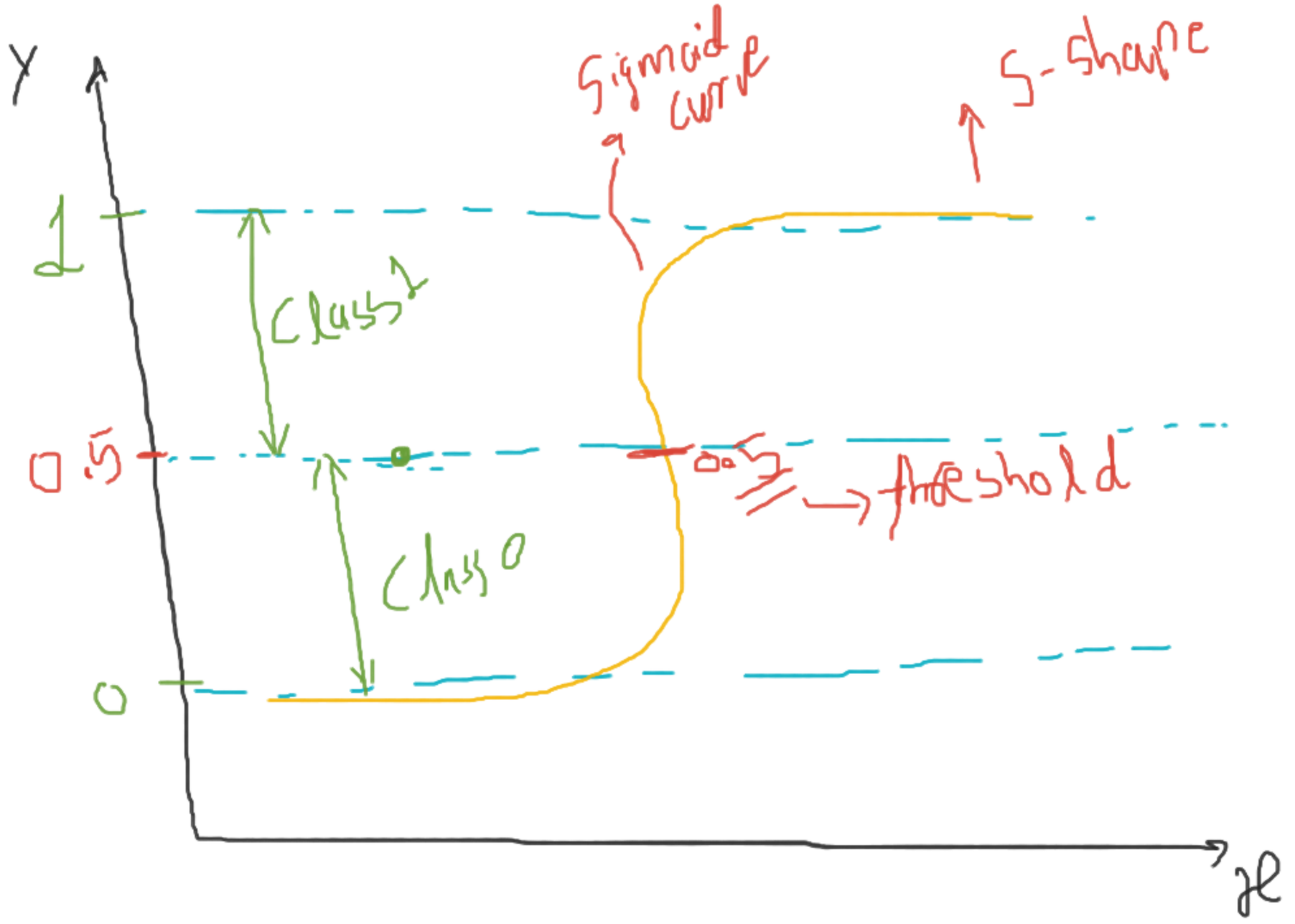
P(Y=0), 2 ✗



Sigmoid function :-

$$\frac{1}{1 + e^{-Y}}$$

$$= \frac{1}{1 + e^{-(mx + c)}}$$


Y
Sigmoid curve
S-shape
1
Class 1
0.5
0.5
threshold
Class 0
0
z

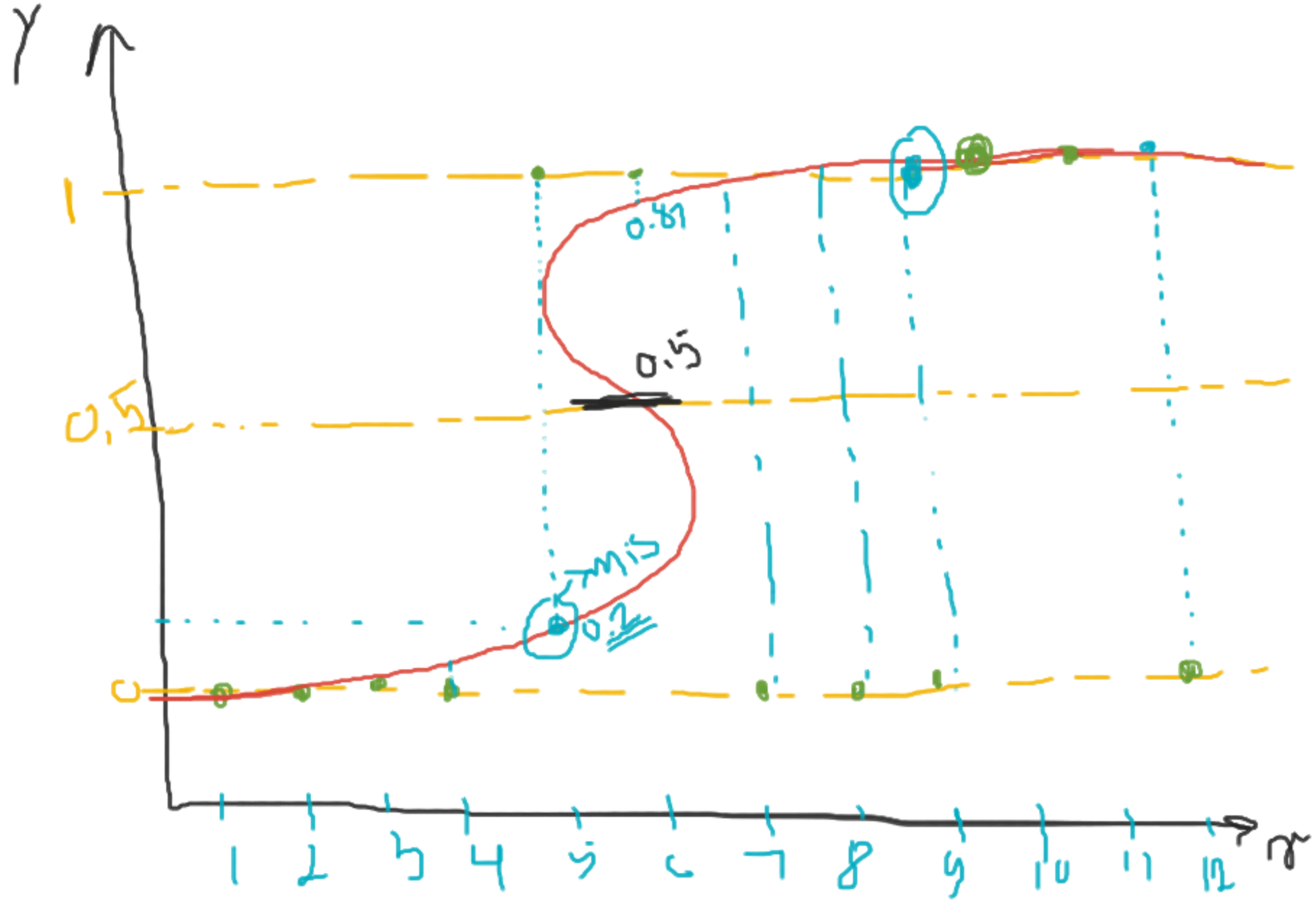
$P(y) = 0 \text{ to } 1$

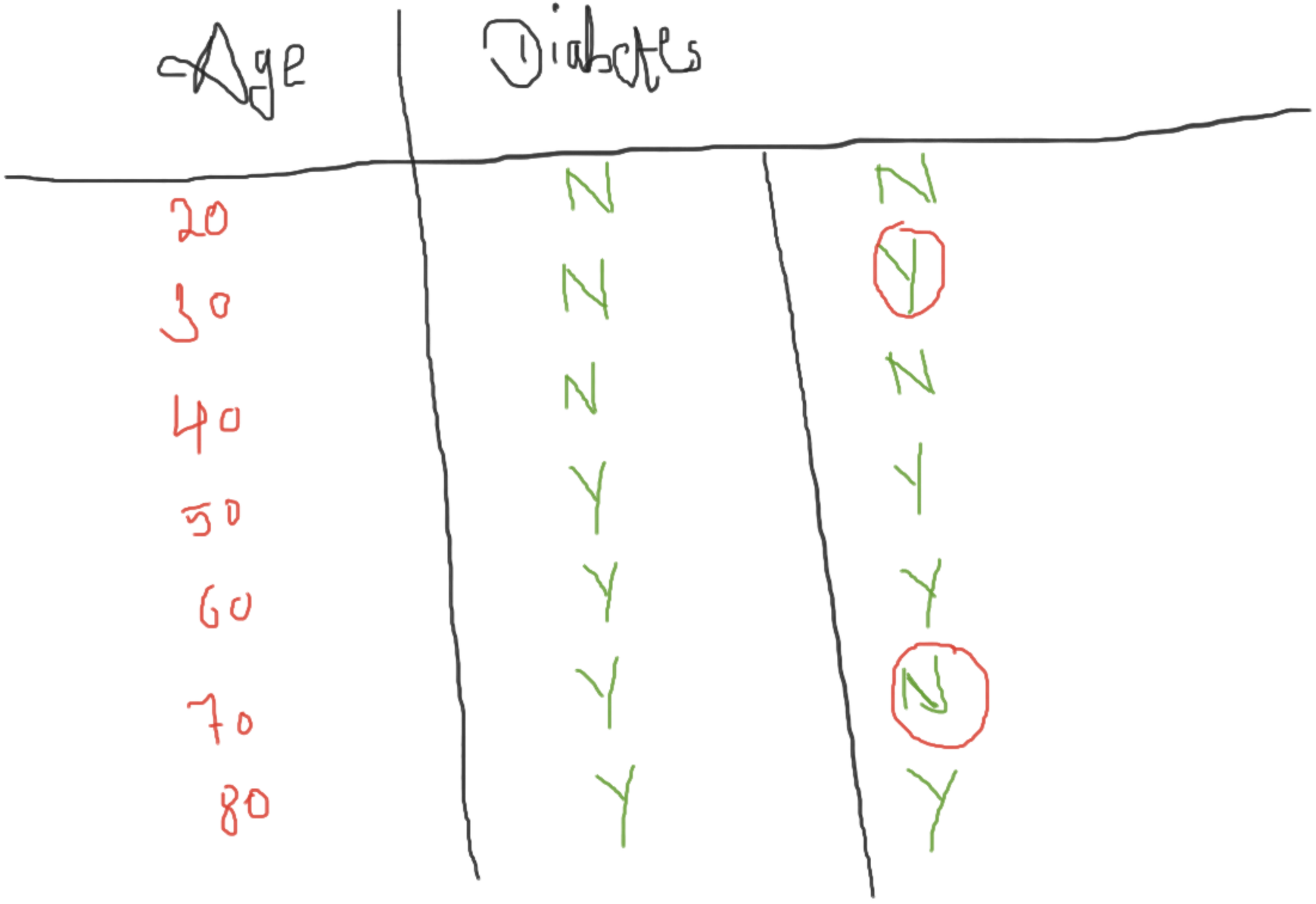
Standard threshold

0 0.1 0.2 0.3 0.4 **0.5** 0.6 0.7 0.8 0.9 1

$\geq 0.5 \Rightarrow$ class 1

$< 0.5 \Rightarrow$ class 0


y
1
0,5
0
0.8
0.5
0.2
1 2 3 4 5 6 7 8 9 10 11 12
x


Age
Diabetes
20
30
40
50
60
70
80
N
N
N
Y
Y
Y
Y
N
Y
N
N
Y
Y
N
Y