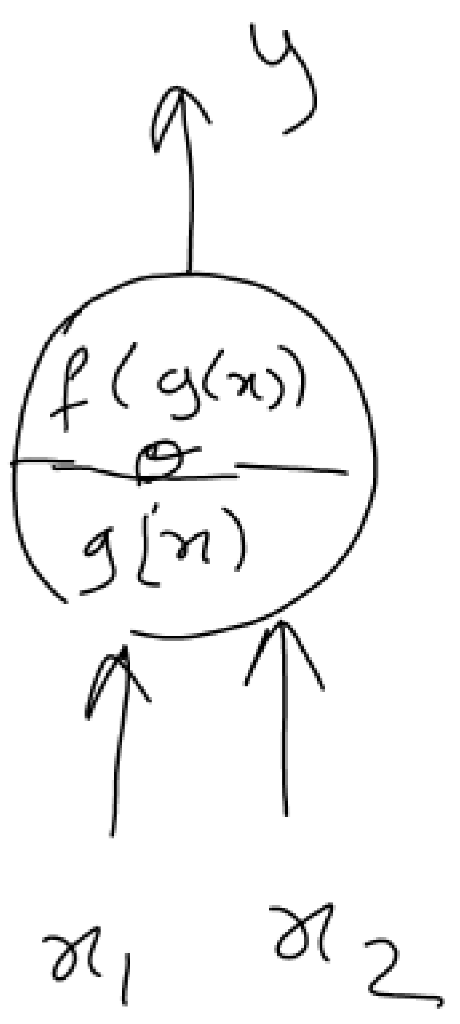
Mcculloch pitts gates logic

OR gate

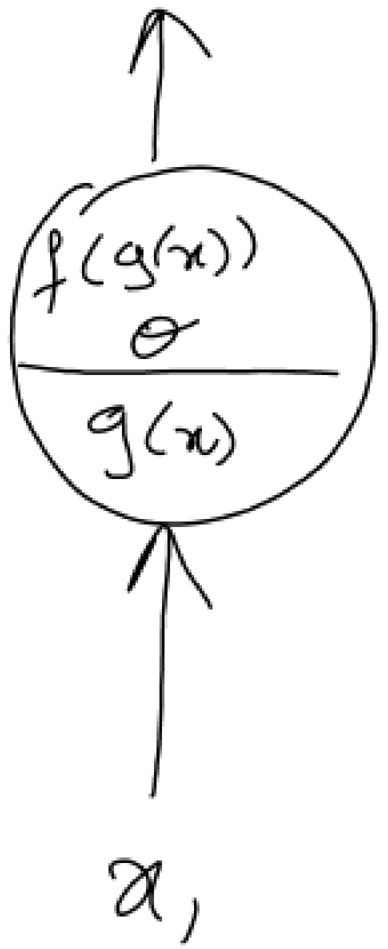
$$f(g(x)) = \begin{cases} 1 \\ 0 \end{cases}$$

$\theta >= 1$



AND gate

$$f(g(x)) \begin{cases} 1 & \theta >= 2 \\ & \text{else} \\ 0 \end{cases}$$



Not

$$f(g(x)) = \begin{cases} 1 & \theta < 1 \\ & \text{else} \\ 0 \end{cases}$$

q 10 marks

$$\text{NAND} \quad f(g(x)) = \begin{cases} 1 & \theta < 2 \\ & \text{else} \\ 0 \end{cases}$$

x_1	x_2	$g(x)$	$f(g(x))$
0	0	0	1
0	1	1	1
1	0	1	1
1	1	2	0

NAND

Suppose we have inputs

$x_1 = 1$

$x_2 = 0$

$x_3 = 0$

$x_4 = 1$

$w_1 = 0.2$

$w_2 = -0.3$

$w_3 = 0.5$

$w_4 = -0.4$

$T = \text{Target} = 0.1$

find the o/p of MLP neuron

for

$$g(x) = \sum_{i=1}^{n} x_i w_i$$

$E =$

$$f(x) = \begin{cases} g(x) \geq T \rightarrow 1 \\ g(x) < T \rightarrow 0 \end{cases}$$

$$g(x) = \sum_{i=1}^{n} (1) * 0.2 + 0 + 0 + 1 \times (-0.4)$$

$$= 0.2 - 0.4$$

$$\boxed{g(x) = -0.2}$$

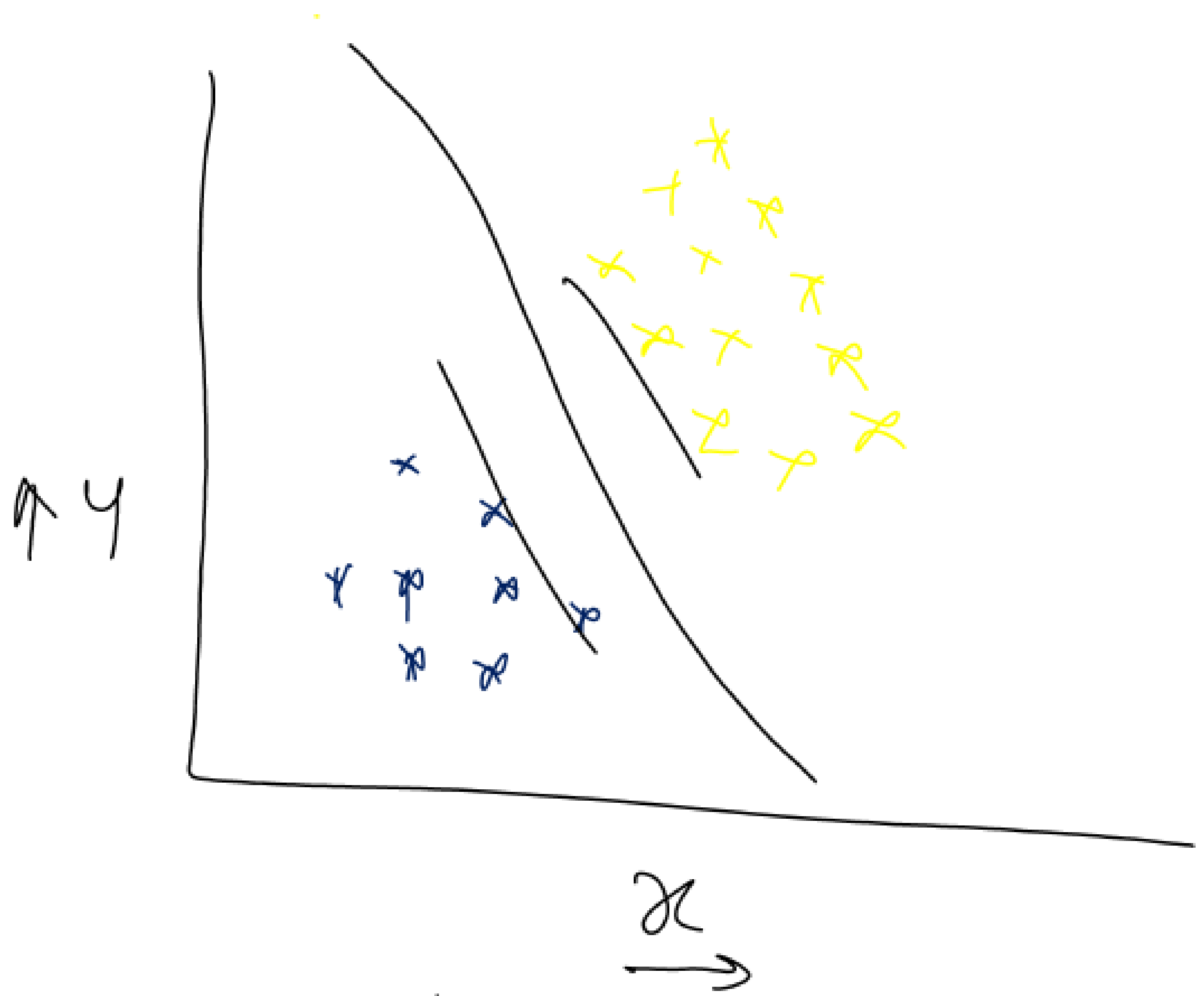
$$\boxed{f(g(x)) = 0}$$

$g(x)$

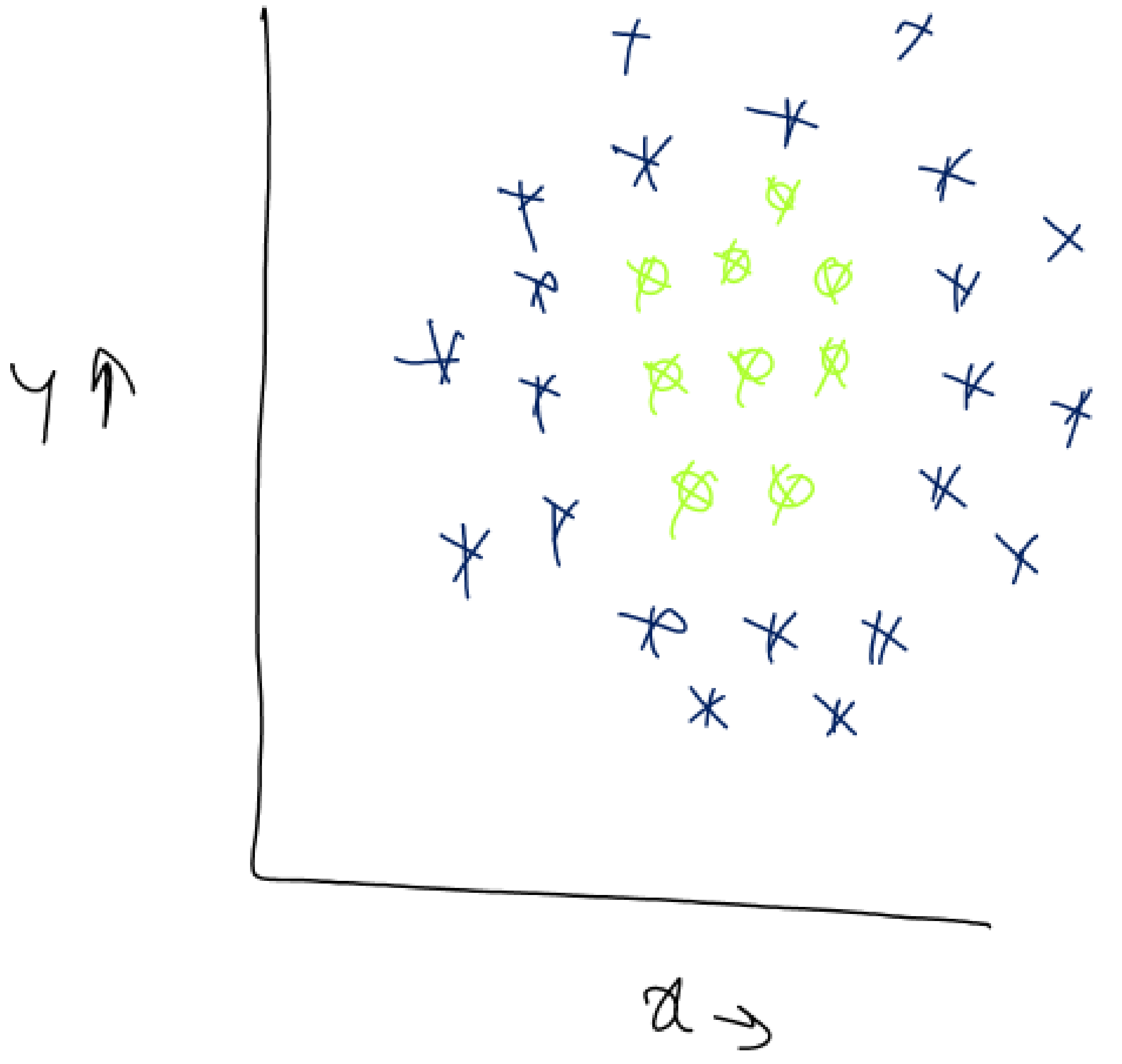
$g'(x)$

Linearly separable

Non-Linear - Separable



Linear



Non-Linear