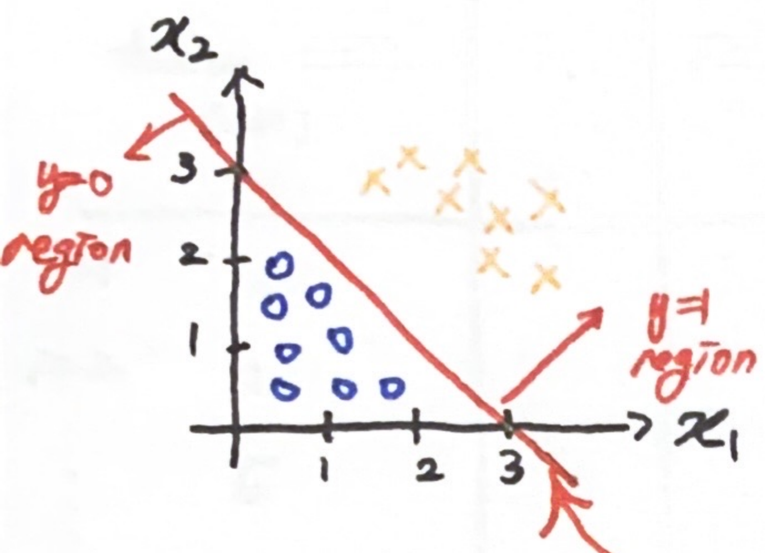
< Decision Boundary Example >

Case # 1



$$f_{\vec{w},b}(\vec{x}) = g(z) = g(w_1 x_1 + w_2 x_2 + b)$$
ex) $w_1 = 1$, $w_2 = 1$, $b = -3$

Decision Boundary : $z = 0$

$\therefore z = 1 \cdot x_1 + 1 \cdot x_2 - 3 = 0$

$x_1 + x_2 = 3$.

⇒ * decision boundary는 parameter $\vec{w}, b$ 에 의해 결정됨

① $y=1$ (class 1) region

: $z \geq 0$

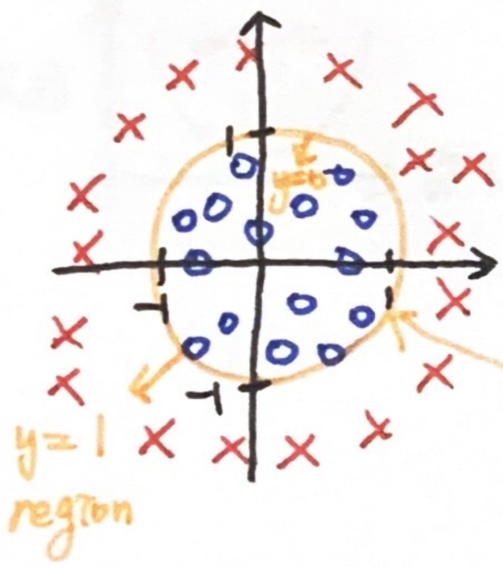
$\Rightarrow x_1 + x_2 \geq 3$.

② $y=0$ (class 0) region

: $z < 0$

$\Rightarrow x_1 + x_2 < 3$ ..

Case # 2 : Non-linear decision boundaries



$$f_{\vec{w},b}(\vec{x}) = g(z) = g(w_1 x_1^2 + w_2 x_2^2 + b)$$
ex) $w_1 = 1$, $w_2 = 1$, $b = -1$

Decision Boundary : $z = 1 \cdot x_1^2 + 1 \cdot x_2^2 - 1 = 0$

$x_1^2 + x_2^2 = 1$.

① $y=1$ (class 1) region : $z \geq 0$

$\Rightarrow x_1^2 + x_2^2 \geq 1$.

② $y=0$ (class 0) region : $z < 0$

$\Rightarrow x_1^2 + x_2^2 < 0$ ..