Problem 1

$g_{12}(\underline{x}) = -x_1 - x_2 + 5$

$g_{13}(\underline{x}) = -x_1 + 3$

$g_{23}(\underline{x}) = -x_1 + x_2 - 1$

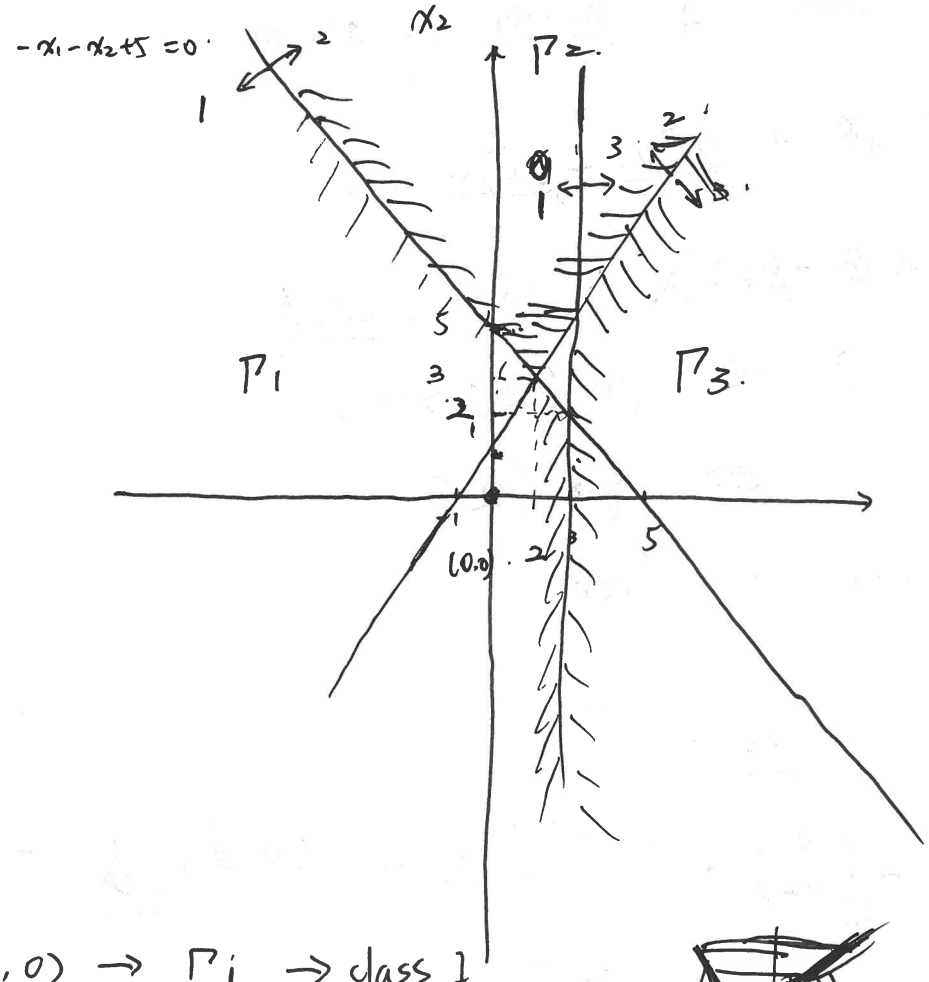
class 1 $\begin{cases} g_{12}(\underline{x}) > 0 \\ g_{13}(\underline{x}) > 0 \end{cases}$

class 2 $\begin{cases} g_{12}(\underline{x}) < 0 \\ g_{23}(\underline{x}) > 0 \end{cases}$

class 3 $\begin{cases} g_{13}(\underline{x}) < 0 \\ g_{23}(\underline{x}) < 0 \end{cases}$

class 1 $\begin{cases} -x_1 - x_2 + 5 > 0 \\ -x_1 + 3 > 0 \end{cases}$

class 3 $\begin{cases} -x_1 + 3 < 0 \\ -x_1 + x_2 - 1 < 0 \end{cases}$



class 2 $\begin{cases} -x_1 - x_2 + 5 < 0 \\ -x_1 + x_2 - 1 > 0 \end{cases}$

$y = x + 1$

(4, 1)

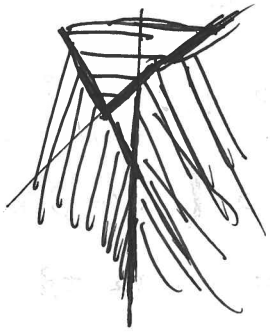
(1, 5)

(0, 0).

(0, 0) → Γ_1 → class 1

(4, 1) → Γ_3 → class 3

(1, 5) → Γ_2 → class 2.



the boundary is shown.