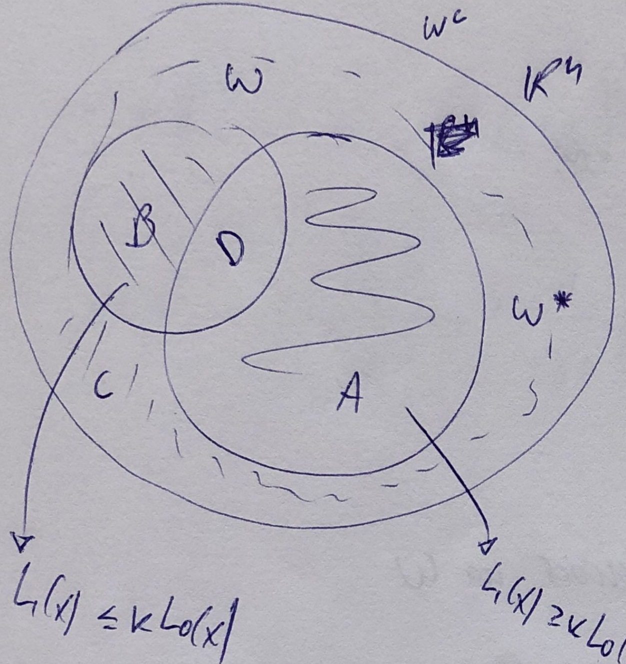
Dim) $\alpha = \mathbb{P}(\vec{x}^0 \in w^* | H_0) = \mathbb{P}(\vec{x}^0 \in w | H_0) \Rightarrow \mathbb{P}(\vec{x}^0 \notin w^* | H_1) \le \mathbb{P}(\vec{x}^0 \notin w | H_1)$

$$\mathbb{P}(\vec{x}^0 \notin w | H_1) = \int_{w^c} L_1(x)\,dx = \int_A L_1(x)\,dx + \int_C L_1(x)\,dx + \int_B L_1(x)\,dx - \int_B L_1(x)\,dx \;(=)$$



$w^c = A \cup C \quad (w^*)^c = B \cup C \Rightarrow$

$$(=) \int_{(w^*)^c} L_1(x)\,dx + \int_A L_1(x)\,dx - \int_B L_1(x)\,dx =$$

$$= \mathbb{P}(\vec{x}^0 \notin w^* | H_1) + \overbrace{\cancel{\int_A L_1(x)\,dx - \int_B L_1(x)\,dx}}^{\ge 0} \ge$$

$$\ge \mathbb{P}(\vec{x}^0 \notin w^* | H_1)$$

$$\int_A L_1(x)\,dx - \int_B L_1(x)\,dx \overset{?}{\ge} k \int_A L_0(x)\,dx$$

$$\alpha = \int_{w^*} L_0(x)\,dx = \int_A L_0(x)\,dx + \cancel{\int_D L_0(x)\,dx} = \int_w L_0(x)\,dx = \int_B L_0(x)\,dx + \cancel{\int_D L_0(x)\,dx}$$