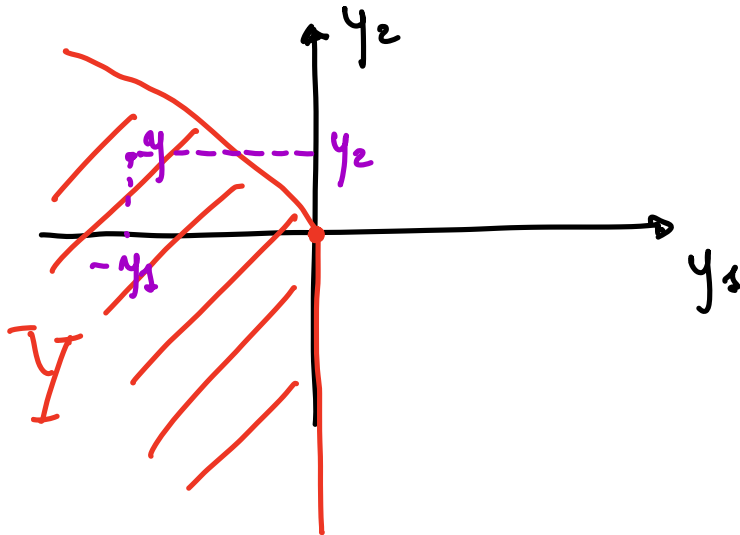
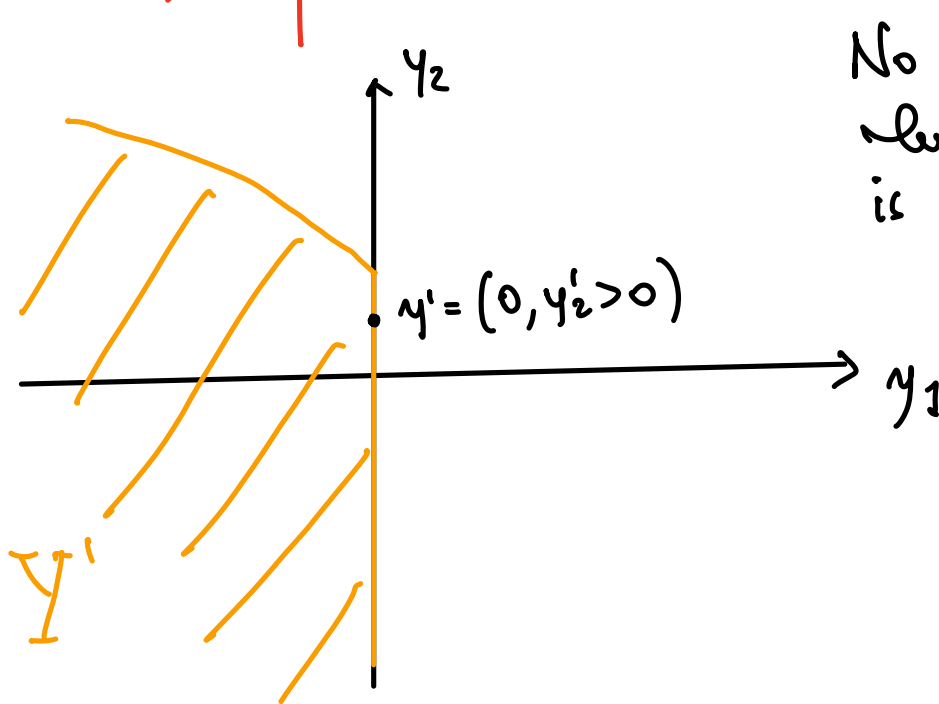


Production set

a) No free lunch : $Y \cap \mathbb{R}_+^2 = \{\emptyset\}$



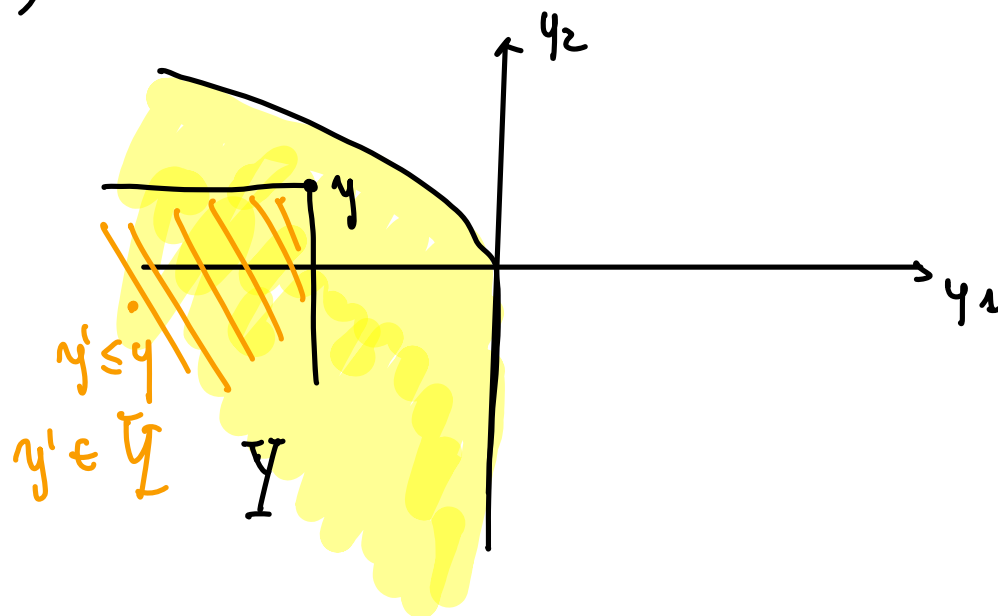
Geometric
representation
of Y that
satisfies 4)



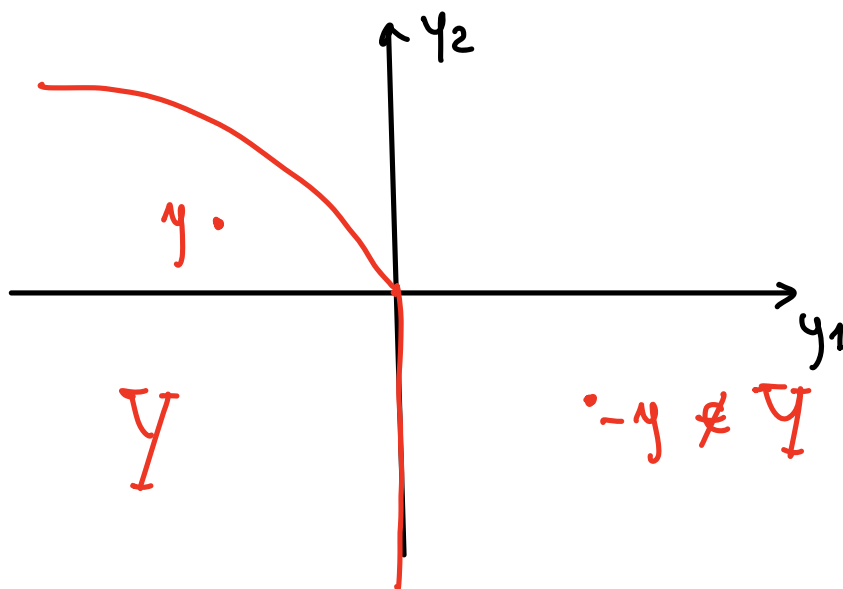
No free
lunch
is violated

Inputs are essential for
production

5) Free disposal : $\mathcal{Y} - \mathbb{R}_+^2 \subseteq \mathcal{Y}$



6) Irreversibility : if $\forall y \in \mathcal{Y}$ with $y \neq 0$
then $-y \notin \mathcal{Y}$

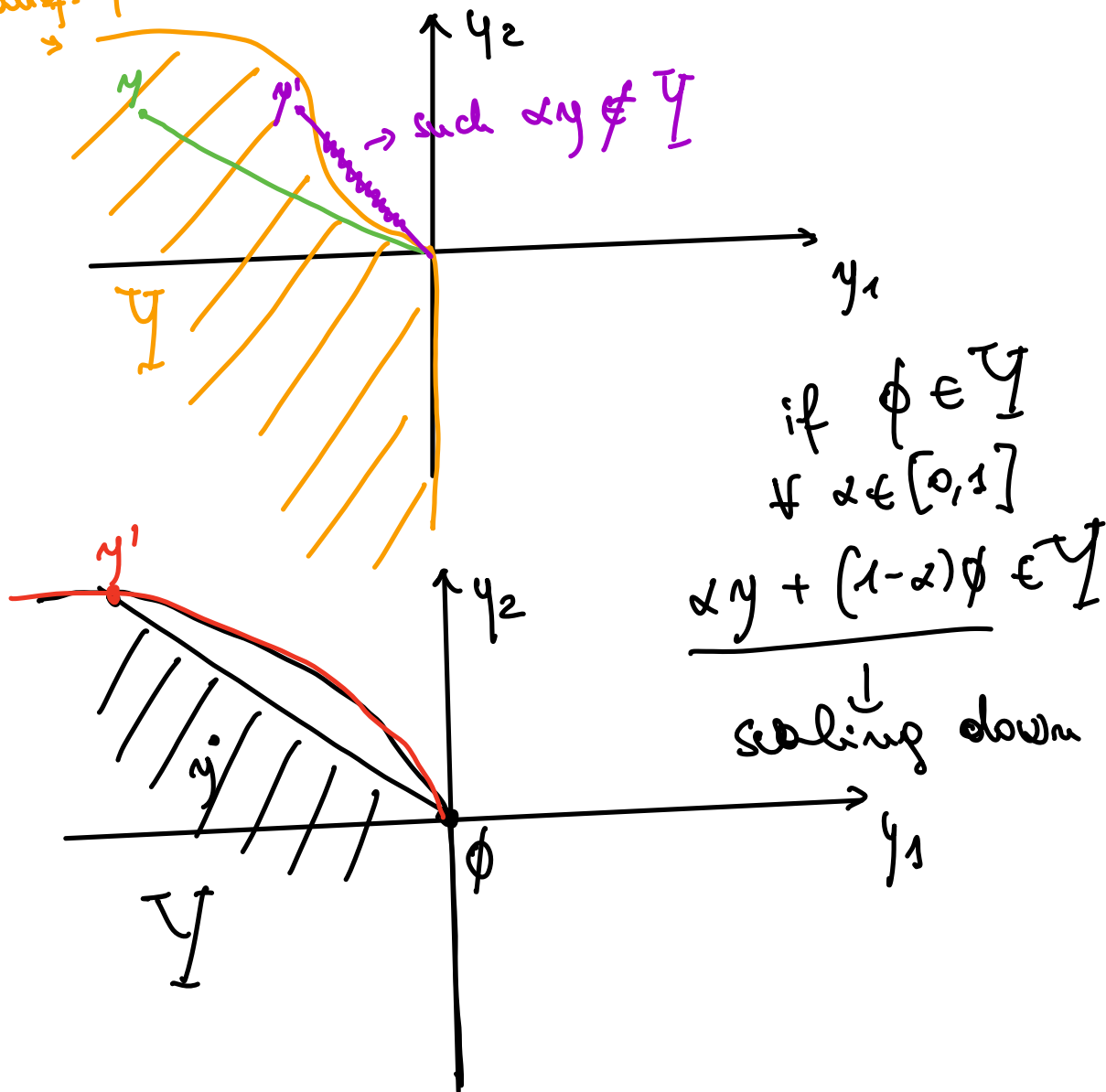


RETURNS TO SCALE

f) Non-increasing returns to scale :

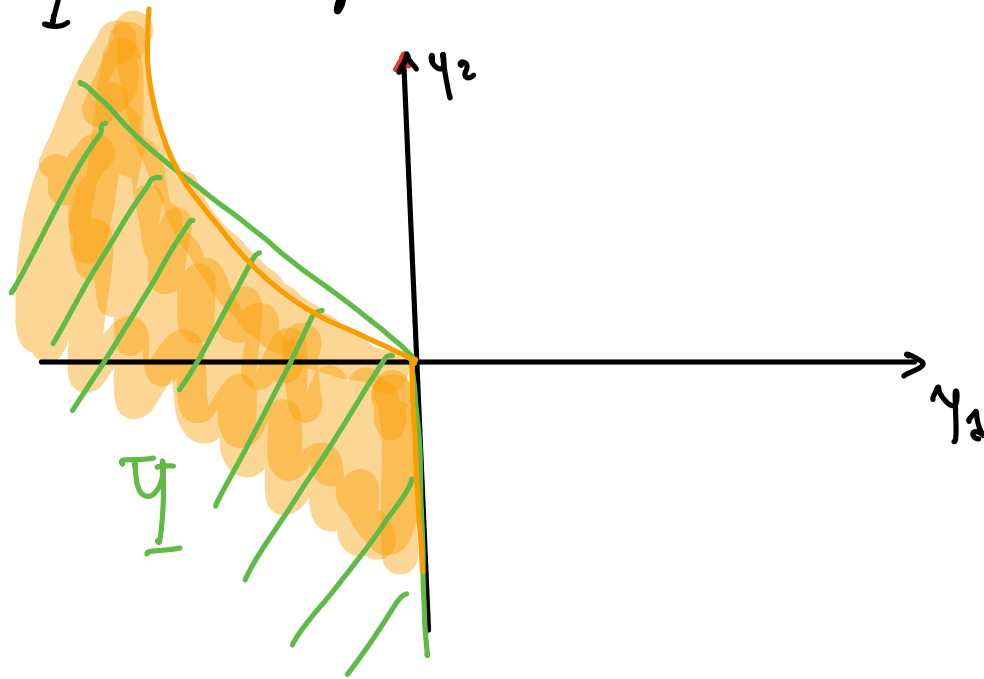
$$\forall y \in Y \Rightarrow \underline{\alpha y} \in Y \quad \forall \alpha \in [0, 1]$$

transf. frontier



8) Non-decreasing returns to scale

$$\forall y \in Y \Rightarrow \alpha y \in Y \quad \forall \alpha \geq 1$$



9) Constant returns to scale

$$\forall y \in Y \Rightarrow \alpha y \in Y \quad \forall \alpha \geq 0$$

