Soit $E, F$ des ensembles.

# 1 Lemme des bergers

$$\left( |E|, |F| \in \mathbb{N} \wedge \exists p \in \mathbb{N}, \begin{cases} \exists I \subset \mathbb{N}, \begin{cases} E = \coprod_{i \in I} E_i \\ \forall i \in I,\ |E_i| = p \end{cases} \\ \text{ou} \\ \exists f \in \operatorname{Surj}(E, F),\ \forall x \in F,\ |f^{\leftarrow}(\{x\})| = p \end{cases} \right) \implies |E| = \frac{|F|}{p}$$

# 2 Principe des tirroirs

$$|E| < |F| < +\infty \implies \begin{cases} \operatorname{Surj}(E, F) & = \emptyset \\ \operatorname{Inj}(F, E) & = \emptyset \end{cases}$$