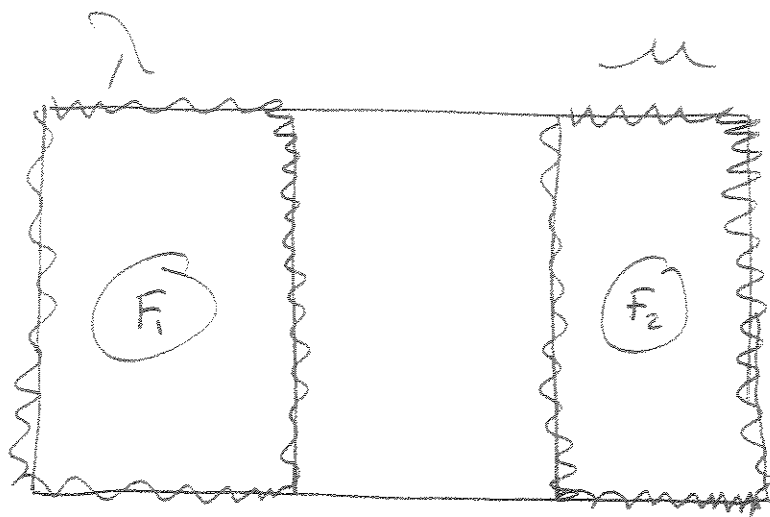


Exercise 1



$\lambda$  and  $\mu$  are 1-cycles which are not boundaries in  $\mathbb{R}^2 - (F_1 \cup F_2)$ .  
Then

$$\begin{aligned} \lambda &= \partial T_1 = \partial T_2 && \text{in } \mathbb{R}^2 \\ \mu &= \partial S_1 = \partial S_2 && \text{in } \mathbb{R}^2 \end{aligned}$$

and we may assume  $F_i \subseteq S_i$  and  $F_i \subseteq T_i$  for  $i=1,2$ .

Then  $T_i + S_i \cap (F_1 \cup F_2) = \emptyset$  so  $\lambda + \mu = \partial(T_1 + S_1)$  in  $\mathbb{R}^2 - (F_1 \cup F_2)$ .

Draw  $S_1, T_1, S_2, T_2$  and  $S_1 + T_1$ .

Exercise 2 Same Exercise for

