

Ex 2.35.

for $p_1, p_2 \in X$,

$f_1^{-1}(0) = \{p_1\}$ & $f_2^{-1}(0) = \{p_2\}$
for $f = f_1 \cup f_2$.

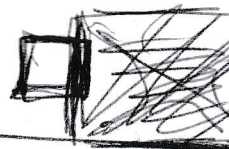
~~$f_1 \cup f_2$~~
(.)

$f_2^{-1}(A)$

for f_2 cts $\rightarrow g = f_2 \circ f_1$ is cts.

then taking $A = \{0\}$, $B = \{2\}$ open sets
disjoint sets in \mathbb{R} .

then $p_1 \in f_1^{-1}(A)$ & $p_2 \in f_2^{-1}(B)$ disjoint open



Ex 2.38 $a_i \rightarrow a$ an points

~~$\forall \epsilon > 0 \exists \delta > 0$~~

$\forall \epsilon > 0 \exists \delta > 0$ s.t. $a \in U_{\delta}(a)$, $a_j \notin U_{\delta}(a)$

$\{a_i\} = \bigcap_{j \in \mathbb{N}} U_{1/j}(a)$ is open

2.40 $U = \bigcup_i B_i$ $B_i \in \mathcal{F}$ so done

b) similarly

$B_k = \bigcup_{r \in \mathbb{N}} B_{kr}$
so done

2.42. a) Can write any open ball as the union of these sets fine!