

Example topologies on

$$H = \{(x, y) \in \mathbb{R}^2 \mid y \geq 0\}$$

$$= \bigcup \cup L$$

$$\{(x, y); y > 0\} \quad \hookrightarrow \{(x, 0) \mid x \in \mathbb{R}\}$$

①

subbasis open sets.

(I)  $B(z, \epsilon) \subset U \quad \epsilon > 0$   
 $z \in U$



(H, disk circle)

(II)  $\{x\} \cup B(z, \epsilon)$  tangent to L at x

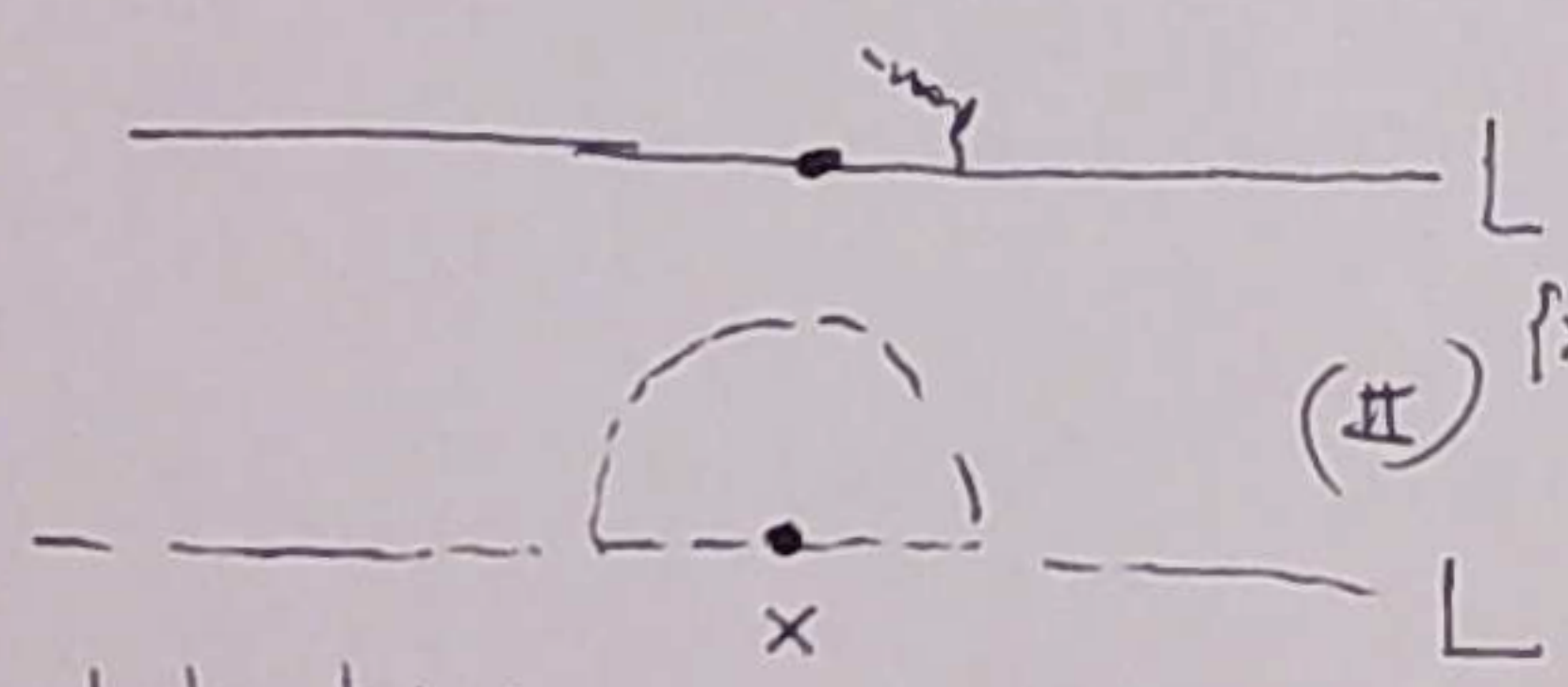
"Moore plane", "Nemytskiĭ plane"

[regular, but not normal!]

②

subbasis open sets

(I)  $B(z, \epsilon) \subset U$   
 $\iff z \in U$



(II)  $\{x\} \cup$  open half-disk (w/o its boundary pt)

"half disk topology"

[Hausdorff but not regular!]

subbasis open sets

③ induced topology from  $\mathbb{R}^2$ .

