

2022/10/18

Ex 1.5.2 (1)

(1) [ ਜ਼ਕਰਦ:  $\forall 0 \in \mathcal{O}^e, id^{-1}(0) \in \mathcal{O}^d$  ]

$\forall 0 \in \mathcal{O}^e$  ਏਕੜ.

[ ਜ਼ਕਰਦ:  $id^{-1}(0) \in \mathcal{O}^d$  ]

$id^{-1}(0) = 0 \in \mathcal{O}^d$  //

(2)

(2) [ ਜ਼ਕਰਦ:  $\exists 0 \in \mathcal{O}^d : id^{-1}(0) \notin \mathcal{O}^e$  ]

$0 := \{1\}$  ਕਰਕੇ,  $0 \in \mathcal{O}^d$ .

[ ਜ਼ਕਰਦ:  $id^{-1}(0) \notin \mathcal{O}^e$  ]

$id^{-1}(0) = 0 = \{1\} \notin \mathcal{O}^e$  //



### LEM 1.5.7

( $\Rightarrow$ )

$$x \in X - f^{-1}(V)$$

$$\Leftrightarrow x \notin f^{-1}(V)$$

$$\Leftrightarrow f(x) \notin V$$

$$\Leftrightarrow f(x) \in Y - V$$

$$\Leftrightarrow x \in f^{-1}(Y - V) \quad //$$

### PROP 1.5.5

( $\Leftarrow$ )

( $\Rightarrow$ ) 小.721

$$(\Rightarrow) [ \exists \delta > 0 : \forall A \in \mathcal{A}_r, f^{-1}(A) \in \mathcal{A}_x ]$$

$$\forall A \in \mathcal{A}_r \exists \delta > 0$$

$$\left[ \begin{array}{l} \exists \delta > 0 : f^{-1}(A) \in \mathcal{A}_x \\ \text{i.e., } X - f^{-1}(A) \in \mathcal{O}_x \end{array} \right]$$

$$X - f^{-1}(A) = f^{-1}(Y - A) \in \mathcal{O}_x$$

$$\left( \begin{array}{l} \because Y - A \in \mathcal{O}_r \\ f: \text{cont} \end{array} \right) //$$