$$L_M \coloneqq \text{ Left Ideals of } M \; \forall M \in Ob(Monoid)$$

$$\begin{array}{l} L_M = \{M, \emptyset\} \wedge (e \in X \implies X = M \; \forall X \in L_M) \implies \\ \{X \in L_M \mid e \notin X\} = \{\emptyset\} \implies \\ \forall x \in M, \exists y \in M | x \times y = e \implies \\ M \in Ob(Grp) \end{array} \quad \text{(from)}$$

$$\begin{array}{l} M \in Ob(Grp) \implies \\ \forall x \in M, \exists y \in M | x \times y = e \implies \\ \forall X \in L_M \setminus \emptyset, e \in X \implies \\ \forall X \in L_M \setminus \emptyset, X = M \implies \\ L_M = \{M, \emptyset\} \end{array} \quad \text{(to)}$$

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$$L_M = \{M, \emptyset\} \cong M \in Ob(Grp)$$