

Definition 8.a.2. [OGW]^a Let (X, τ) be a topological space and let $x_0 \in X$.

- We denote as **neighbourhood** of x_0 any superset of an open set containing x_0 .
- We call **fundamental system of neighbourhoods** of x_0 a family $\{U_i\}_{i \in I}$ of neighborhoods x_0 with the property that each neighborhood of x_0 contains at least one of the U_i .

We will say that U is an **open neighborhood** of x_0 simply to say that U is an open set that contains x_0 .

^aDefinition 5.6.4 in the notes [?]