Definition (Lower set). A *lower set* is a subset S of a poset $\mathbf{P}$ if, if a point is inside, all points below it are inside as well. In formulas:

$$S \text{ is a lower set of } \mathbf{P} \equiv \forall x \in S, \forall y \in \mathbf{P} : \; y \preceq_{\mathbf{P}} x \Rightarrow y \in S.$$