

Let $S = \{1, \{1\}, 2, \{2, 3\}\}$. Find a set satisfying each of the following criteria, or explain why such a set does not exist.

- A set A such that $A \in S$ and $A \subseteq S$.
- A set B such that $B \in S$ and $A \in \mathcal{P}(S)$.
- A set C such that $C \in S$ and $C \subseteq \mathcal{P}(S)$.
- A set D such that $D \in \mathcal{P}(S)$ and $D \subseteq \mathcal{P}(S)$.