Decidability.
Let our domain be the set of natural numbers.

1) Suppose that membership in each of $S_1$ and $S_2$ is decidable.
Show that membership in $S_1 \cup S_2$ is decidable.

To show that a problem is decidable, we need to give an algorithm to solve it. Here is an algorithm to determine membership in $S_1 \cup S_2$.

Given a natural number $x$, check whether $x$ is in $S_1$.
If $x \in S_1$, return yes ($x$ is in $S_1 \cup S_2$).
If $x \notin S_1$, check whether $x$ is in $S_2$.
If $x \in S_2$, return yes. Otherwise, return no.

(We can decide whether $x$ is in $S_1$ and $x$ is in $S_2$ because membership in each of $S_1$ and $S_2$ is decidable.)