# C241 HW8 Mini

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**Claim**: For all sets $A, B, C$, and $D$, if $A \cup B \subseteq D$, then $A \setminus B \subseteq D \setminus B$.

*Proof.* Choose sets $A, B, C$, and $D$, and assume that $A \cup B \subseteq D$.

> Choose some $x \in A \setminus B$.
>
> Since $x \in A \setminus B,\ x \in A$ and $x \notin B$.
>
> Since $x \in A,\ x \in A \cup B$.
>
> So also $x \in D$ because $A \cup B \subseteq D$.
>
> Thus since $x \in D$ and $x \notin B,\ x \in D \setminus B$.

Therefore $A \setminus B \subseteq D \setminus B$. □