1. (2 pt) Consider the statement $x \in \left(\bigcap_{\alpha \in \Lambda} A_\alpha\right)^{\mathrm{c}}$, where $\Lambda$ is a nonempty index set and each $A_\alpha$ is a set. Copy the following statement and fill in the blanks to make it true: (for all or there exists) $\alpha \in \Lambda$, $x$ (in or not in) $A_\alpha$.

2. (5 pt) Consider the statement $x \in \left(\bigcup_{\alpha \in \Lambda} A_\alpha\right)^{\mathrm{c}} \bigcup \left(\bigcap_{\beta \in \Gamma} B_\beta\right)$, where $\Lambda, \Gamma$ are nonempty index sets and each $A_\alpha, B_\beta$ is a set. Copy the following statement and fill in the blanks to make it true: (for all or there exists) $\alpha \in \Lambda$, $x$ (in or not in) $A_\alpha$ (and or or) (for all or there exists) $\beta \in \Gamma$, $x$ (in or not in) $B_\beta$.

3. (5 pt) Let $A$ and $B$ be sets. Prove that $A \setminus B = A \bigcap B^{\mathrm{c}}$.