HOMEWORK 5

1) Prove that if A and B are sets such that $A \cup B \neq \phi$, then $A \neq \phi$ or $B \neq \phi$.

2) Disprove that if A and B are sets such that $A \cap B = \phi$, then $A = \phi$ or $B = \phi$.

3) Let A, B, and C be sets.
   a) Define A, B, and C such that $A \cap B = A \cap C$, but $B \neq C$.
   b) Define A, B, and C such that $A \cup B = A \cup C$, but $B \neq C$.
   c) Prove that if $A \cap B = A \cap C$ and $A \cup B = A \cup C$, then $B = C$.

4) Prove that $\overline{A \cup B} = \overline{A} \cap \overline{B}$. (You are to prove this part of Thm 4.21.)

5) Let A and B be sets. Prove that $B \subseteq A$ if and only if $A \cup B = A$.

6) Let A and B be sets. Prove that if $A - B \neq \phi$, then $A \nsubseteq B$.

Not collected Book problems: $4.27, 4.33, 4.34, 4.37, 4.61, 4.64$