Exercise 34. Let A_i, $i \in I$, be an indexed family of sets. Prove the second half of DeMorgan's Law:

$$\left(\bigcap_{i \in I} A_i \right)^c = \bigcup_{i \in I} A_i^c.$$

Exercise 35. Let $I = \{3, 4, 5\}$, and for each $i \in I$ let $A_i = \{i, i+1, i+2, 3i\}$. Find $\bigcap_{i \in I} A_i$ and $\bigcup_{i \in I} A_i$.

Exercise 36. Let A_i, $i \in I$, be an indexed family of sets. If B is any set, prove that

$$B \cap \left(\bigcup_{i \in I} A_i \right) = \bigcup_{i \in I} (B \cap A_i).$$