Assignment 4 (additional problems)

1. Prove that for any sets A,B,C,
$$A \times (B \cap C) = (A \times B) \cap (A \times C)$$

2. Prove that for any sets B,C,
$$B \subseteq C \Leftrightarrow B \cap C = B$$

3. Let $A \subseteq U$ and $B \subseteq U$. Prove that
$$B \subseteq U - A \Rightarrow A \subseteq U - B$$