Problem 3.61

(c) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

Pf: let A, B, C be sets.

($\subseteq$) let $(x,y) \in A \times (B \cap C)$. By def of Cartesian product, $x \in A$ and $y \in B \cap C$.

By def of int, $y \in B$ and $y \in C$. By def Cart prod, $(x,y) \in A \times B$ and $(x,y) \in A \times C$. So, $(x,y) \in (A \times B) \cap (A \times C)$.

($\supseteq$) Reverse above.