Theorem (2.2.16d). *Let A and B be sets. $A \cap (B - A) = \emptyset$.*

Proof. Let x be an element in $A \cap (B - A)$. Note that $(B - A) \equiv (B \cap \overline{A})$. Because set intersection is associative we can drop the parentheses, giving us $A \cap B \cap \overline{A}$. This is logically defined as $(x \in A) \wedge (x \in B) \wedge (x \notin A) \equiv \bot$. Because this statement is false $\forall x$ in the domain, $A \cap (B - A)$ is empty. ∎