Name _____Quiz 3

1) Given $A = \{1,2,3\}$, $B = \{2,3,4\}$, $C = \{1,4,5,6\}$, and $D = \{3,6\}$ find the sets below. The universe is all positive integers less than 10.

$A \cap B = \{2,3\}$

$B \cup D = \{2,3,4,6\}$

$A - C = \{2,3\}$

$A^c = \{4,5,6,7,8,9\}$

$B \times D = \{(2,3), (2,6), (3,3), (3,6), (4,3), (4,6)\}$

2) Let $A$ and $B$ be sets. Prove that $A \cap B \subseteq A$.

Suppose $x \in A \cap B$. This means that $x \in A$ and $x \in B$, In particular $x \in A$. Therefore by the definition of subset, $A \cap B \subseteq A$

3) Let $A$ and $B$ be sets. Prove that $(A \cup B = B) \Rightarrow A \subseteq B$

Suppose $A \cup B = B$. Now assume $x \in A$. Thus $x \in A \cup B$, and so the assumption that $A \cup B = B$ tells us that also $x \in B$. Therefore $A \subseteq B$