Moar identities

Theorem

1. $(A \cap B)^c = A^c \cup B^c$;
2. $(A \cup B)^c = A^c \cap B^c$;
3. $(A^c)^c = A$;
4. $A \setminus B = A \cap B^c$;
5. $A \subseteq B \iff B^c \subseteq A^c$.

Recall the observation we made earlier that, at least in one case,

$$A = (A \cap B) \cup (A \setminus B).$$

Ok, but using identities above:

$$A = A \cap U = A \cap (B \cup B^c) = (A \cap B) \cup (A \cap B^c) = (A \cap B) \cup (A \setminus B).$$

So this always holds!