Math 248 Group Quiz 3

Names: _____

1. Let A, B, C be sets. Define $A \triangle B$ to be the set $(A \setminus B) \cup (B \setminus A)$. Proof or counterexample:

$$A \cap (B \triangle C) = (A \cap B) \triangle (A \cap C).$$

2. Let A, B, C be sets. Proof or counterexample: $(A \setminus B) \cup (B \setminus C) = (A \cup B) \setminus (B \cap C)$.

3. Proof or counterexample: For all sets A, B, if $A \subseteq B$, then there is a C such that $A = B \cap C$.

4. Prove that if $n \in \mathbb{Z}$ and $n \geq 4$, then $2^n \leq n!$ by induction.