Quiz 4

1. (3pts) Prove or disprove: \((A \cup B) - C = (A - C) \cap (B - C)\).

   This is false.

   Counter-example: \(A = \{1, 2, 3\}, \ B = \{3, 4, 5\}, \ C = \{2, 4, 5\}\)
   Then \((A \cup B) - C = \{1, 3\}\) but
   \((A - C) \cap (B - C) = \{1\} \cap \emptyset = \emptyset\).

2. (3pts) Prove using a set equality proof that \(A \Delta B = B \Delta A\).

   \[A \Delta B = \{x : x \in (A - B) \land x \in (B - A)^c\}\]

   \[= \{x : x \in (B - A) \land x \in (A - B)^c\}\] by the commutative property of Boolean algebra

   \[= B \Delta A.\]