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MathSci 119 section 1

Seat _____
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Quiz 4

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

This is false.

Counter-example: $A = \{1, 2\}$, $B = \{3, 4\}$, $C = \{2, 4\}$

$$\begin{aligned} \text{Then } (A \cup B) - C &= \{1, 3\} \text{ but} \\ (A - C) \cap (B - C) &= \{1\} \cap \{3\} = \emptyset. \end{aligned}$$

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

$$A \Delta B = \{x : x \in (A - B) \wedge x \in (B - A)\}$$

$$= \{x : x \in (B - A) \wedge x \in (A - B)\} \text{ by the commutative property of Boolean algebra}$$

$$= B \Delta A.$$

