Homework 5

Problem 1. Prove that for any two sets A, B, $A = B$ if and only if $A \triangle B = \emptyset$

Problem 2. Compute the following sets. No proof required.

1. $\left\{ a + b : a \in \{0, 5\}, b \in \{2, 4\} \right\} \setminus \{7, 10\}$.

2. $(1, 3) \cup [2, 4)$

3. $\mathbb{Z} \cap [0, \infty)$

4. $\mathbb{N}_{even} \Delta \mathbb{N}_+$

Problem 3. Let X and Y be sets.

(i) Prove that $Y \setminus (Y \setminus X) = X \cap Y$.

(ii) Prove that $X \subseteq Y$ if and only if $X \cup Y = Y$.

Problem 4. Prove that if $A \cap B \subseteq C$ and $x \in A \setminus C$, then $x \notin B$.

[Hint: Prove it by contradiction.]