

MATH 582 HOMEWORK 1
WEEK 1
Winter, 2009
Due January 23

Problem 1. Let A , B and C be sets. Show the following.

- (a) $[A \subseteq C \wedge B \subseteq C] \rightarrow A \cup B \subseteq C$.
- (b) $[C \subseteq A \wedge C \subseteq B] \rightarrow C \subseteq A \cap B$.

Problem 2. Let A , B be sets. Prove

$$A \subseteq B \leftrightarrow \text{For any set } C, (C - B) \subseteq (C - A).$$

Problem 3. Let A and B be sets. Show the following.

- (a) $B - (B - A) \subseteq A$.
- (b) $A - B = A - (A \cap B)$.

Problem 4. Let A and B be sets. Prove

$$A \subseteq B \leftrightarrow A \subseteq B - (B - A).$$

Problem 5. Determine the following.

- (a) $\cup \emptyset$.
- (b) $\cap \emptyset$.