Homework #2

Due Thursday, October 5, in class
Problem 1 Show that for any subsets A, B, C of a set X we have

$$X = B \cup (X \setminus C) \cup (A \cap C) \cup ((X \setminus A) \cap (X \setminus B))$$

Problem 2 Prove that for any two families of sets A and B

$$(\cup\{X : X \in A\}) \setminus (\cup\{Y : Y \in B\}) \subset \cup\{X \setminus Y : X \in A,\ Y \in B\}$$

Problem 3 Prove that if $A \cup B = A$ and $A \cap B = A$ then $A = B$.
Problem 4 Give an example of two sets A and B with $(A \setminus B) \cup B \neq A$.
Problem 5 When $(A \setminus B) \cup B \neq A$?
Problem 6 Snow that for any set we have $A = \cup P(A)$. Give an example of a set A with $A \neq P(\cup A)$.