Math 2534  Homework on Sets
Instructions: Put all work on another sheet of paper and show all work.

Problem 1: Is it true that for all sets A and B, that $A \times B = B \times A$. Justify your conclusion.

Problem 2: If $A = \{1, 4, 5, 8, 9\}$ and $B = \{2, 5, 6, 7, 8, 9\}$, find the symmetric difference $A \oplus B$.

Problem 3: Using proof by elements prove the following:
Theorem 1: $(A \cup B)^c = A^c \cap B^c$
Theorem 2: If $A \subseteq B$, Then $B^c \subseteq A^c$.

Problem 4: Given that the symmetric difference $A \oplus B = (A - B) \cup (B - A)$ prove that $A \oplus B$ can also be expressed as $A \oplus B = (A \cup B) - (A \cap B)$:

ie. Use Algebra of sets to prove that $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$.

Problem 5: Draw Venn Diagrams to illustrate the following: $(A - C) \cap (B \cup C)$

Problem 6: If $A = \{a, b\}$ and $B = \{c, d\}$ determine if $P(A \cup B) = P(A) \cup P(B)$ (show all your work).