1) Let \( A = \{a,b,c\} \), \( B = \{x,y\} \) and \( C = \{1,2\} \). Find the following:  
   a) \( A \times B \)  
   b) \( C \times B \)  
   c) \( C \times A \)

2) Prove or give a counter example.  
   Theorem: For all sets \( A \) and \( B \), \( A \times B = B \times A \)

3) Find the power set for:  
   a) \( B = \{1,2,3,4\} \)  
   b) \( A = \{\emptyset, \{\emptyset\}\} \)

4) Given the power set \( P = \{\emptyset, \{y\}\} \), what was the original set?  

5) If \( A = \{h, k, a, i\} \) and \( B = \{a, d, h, k\} \) find the symmetric difference \( A \oplus B \).

6) Draw Venn Diagrams to illustrate the following:  
   a) \( (A - B) \cup C \)  
   b) \( A^C \cap B \cap C^C \)  
   c) \( (A - B) \cup (B - C) \)

7) If the Universal set \( U = \{a,b,c,d,e,f,g,h\} \) and \( A = \{a,d,e,f,h\} \) and \( B = \{b,c,d,e,f,g\} \), find the following:  
   a) \( A \oplus B \)  
   b) \( A \cap B^C \)  
   c) \( A - B \)  
   d) \( A^C \cup B^C \)

8) If \( A \times B = \{(a,b),(b,b),(c,b),(a,a),(b,a),(c,a)\} \), find the elements in sets \( A \) and \( B \).

9) Using elements of sets, prove the following or give a counter example.  
   a) For all sets \( A, B \) and \( C \), if \( A \subseteq B \) and \( C \subseteq B \), then \( A \cup C \subseteq B \)  
   b) For all sets \( A \) and \( B \), \( (A \cup B)^C = A^C \cap B^C \)  
   c) For all set \( A \) and \( B \), \( (A - B) = A \)