

1. Let  $A = \{1, 2, 3, 4, 5\}$ ,  $B = \{0, 1, 4, 8\}$ , and  $C = \{2, 5, 7, 9, 11, 13, 17\}$ .  
Compute each of the following.

- (a)  $A \cup B$ .                      (b)  $A \cap B$ .  
(c)  $A \cap C$ .                      (d)  $A - B$ .  
(e)  $A - (B \cup C)$ .                (f)  $(A - B) \cup (A - C)$ .

2. Let  $A$ ,  $B$ , and  $C$  be the sets given in the previous exercise and let the universal set  $U = \{0, 1, 2, 3, 4, \dots, 20\}$ . Compute the following.

- (a)  $\overline{A}$                       (b)  $\overline{B}$                       (c)  $\overline{A \cap B}$   
(d)  $\overline{A \cup B}$

Let  $A, B \subset C$  be sets. Prove each of the following:

- a)  $A \cap B \subset A$ ;  
b)  $A \cap \emptyset = \emptyset$ ;  
c)  $A \subset B$  if and only if  $A \cap B = A$ .