

1. Let A be the set of students who live within one mile of school and let B be the set of students who walk to classes. Describe the students in each of these sets.

- a) $A \cap B$ b) $A \cup B$
c) $A - B$ d) $B - A$

3. Let $A = \{1, 2, 3, 4, 5\}$ and $B = \{0, 3, 6\}$. Find

- a) $A \cup B$. b) $A \cap B$.
c) $A - B$. d) $B - A$.

15. Prove the second De Morgan law in Table 1 by showing that if A and B are sets, then $\overline{A \cup B} = \overline{A} \cap \overline{B}$

- a) by showing each side is a subset of the other side.
b) using a membership table.

17. Show that if A and B are sets in a universe U then $A \subseteq B$ if and only if $\overline{A} \cup B = U$.

21. Show that if A and B are sets, then

- a) $A - B = A \cap \overline{B}$.
b) $(A \cap B) \cup (A \cap \overline{B}) = A$.

25. Prove the first distributive law from Table 1 by showing that if A , B , and C are sets, then $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.

41. Show that $A \oplus B = (A \cup B) - (A \cap B)$.