

1. If $A=\{3,5,7,9,11\}$; $B=\{7,9,11,13\}$; $C=\{11,13,15\}$; $D=\{15,17\}$ find:
 - i. $(A \cap B) \cap (B \cup C)$
 - ii. $A - B$
 - iii. $A - C$
 - iv. $D - A$
 - v. $D - C$
 - vi. $C - D$
2. Let $U=\{1,2,3,4,5,6,7,8,9\}$; $A=\{2,4,6,8\}$; $B=\{2,3,5,7\}$ prove that
 - i. $(A \cup B)' = A' \cap B'$
 - ii. $(A \cap B)' = A' \cup B'$
3. For sets A, B, and C using properties prove that
 - i. $A - (B \cap C) = (A - B) \cap (A - C)$
 - ii. $(A \cup B) - A = B - A$
 - iii. $(A \cup B) - C = (A - C) \cup (B - C)$
 - iv. $A - (B - C) = (A - B) \cup (A \cap C)$
 - v. $A \cap (B - C) = (A \cap B) - (A \cap C)$
 - vi. $A = (A \cap B) \cup (A - B)$
4. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked product A and B; 12 people liked product C and A; 14 people liked product B and C; and 8 liked all the three products. Find how many liked product C only.
5. In a city three daily newspapers A, B, C are published. 42% of the people in that city read A; 51% read B; 68% read C; 30% read A and B; 28% read B and C; 36% read A and C; 8% do not read any of the three newspapers. Find the percentage of persons who read all the three papers using the above result.
6. In a class of 60 students, 23 play hockey, 15 play basket ball, and 20 play cricket. 7 play hockey and basket ball, 5 play cricket and basketball, 4 play hockey and cricket and 15 students do not play any of these games. Find how many all the three games play.
7. For sets A and B prove using properties:
 - i. If $A \cup B = A \cap B$ then $A = B$
 - ii. If $P(A) = P(B)$ then $A = B$
 - iii. $A \cup (B - A) = A \cup B$
8. Find the domain and range of the real function: $f(x) = \sqrt{9 - x^2}$.
9. If $A = \{-1, 1\}$, find $A \times A \times A$.
10. Let $A = \{1, 2\}$, $B = \{1, 2, 3, 4\}$, $C = \{5, 6\}$ and $D = \{5, 6, 7, 8\}$. Verify that
 - i. $A \times (B \cap C) = (A \times B) \cap (A \times C)$.
 - ii. $A \times C$ is a subset of $B \times D$.