In a committee, 50 people speak French and 20 speak Spanish and 10 speak both French and Spanish. How many people speak atleast one of these two languages?

Solution

Let F denote the set of people who speak French and S denote the set of people who speak Spanish. In the problem the word 'both' denotes intersection and 'atleast' denote union.

Then $n(F) = 50$, $n(S) = 20$, $n(F \cap S) = 10$

$n(F \cup S) = n(F) + n(S) - n(F \cap S) = 50 + 20 - 10 = 60$

Hence 60 people can speak atleast one of these two languages.

In a group of 70 people, 37 like coffee, 52 like tea and each person likes atleast one of the two drinks. How many people like both coffee and tea?

Solution

Let C denote the set of people who like coffee and T denote the set of people who like tea.

$n(C \cup T) = n(C) + n(T) - n(C \cap T)$

$70 = 37 + 52 - n(C \cap T)$

$n(C \cap T) = 37 + 52 - 70 = 19$

$\therefore$ 19 people like both coffee and tea.