Sets Ex 1.8 Q1

$n(A \cup B) = 50,\ n(A) = 28,\ n(B) = 32,$ where $n(x)$ doesnotes the cardinal number of the set x.

We know that $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$\Rightarrow \quad 50 = 28 + 32 - n(A \cap B)$

$\Rightarrow \quad 50 = 60 - n(A \cap B)$

$\Rightarrow \quad n(A \cap B) = 60 - 50$

$= 10$

$\therefore \quad n(A \cap B) = 10$

Sets Ex 1.8 Q2

We have,

$n(P) = 40,\ n(P \cup Q) = 60,\ n(P \cap Q) = 10,$ to find $n(Q)$.

We know $n(P \cup Q) = n(P) + n(Q) - n(P \cap Q)$

$\Rightarrow \quad 60 = 40 + n(Q) - 10$

$\Rightarrow \quad 60 = 30 + n(Q)$

$\Rightarrow \quad n(Q) = 60 - 30$

$= 30$

Hence, Q has 30 elements.

Sets Ex 1.8 Q3

Let $n(P)$ denote the number of teachers who teach Physics and $n(Q)$ denote the number of teachers who teach Mathematics.

We have,

$n(P \text{ or } M) = 20$

i.e $n(P \cup M) = 20$

$n(M) = 12$

and $n(P \cap M) = 4$

To find: $n(P)$

We know $n(P \cup M) = n(P) + n(M) - n(P \cap M)$

$\Rightarrow \quad 20 = n(P) + 12 - 4$

$\Rightarrow \quad 20 = n(P) + 8$

$\Rightarrow \quad n(P) = 20 - 8$

$= 12$

$\therefore$ There are 12 Physics teachers.

Sets Ex 1.8 Q4

Let,

$n(P)$ denote the total number of people

$n(C)$ denote the number of people who like coffee and

$n(T)$ denote the number of people who like tea.

Then, $n(P) = 70$

$n(C) = 37$

$n(T) = 52$

We are given that each person likes at least one of the two drinks, i.e., $P = C \cup T$

To find: $n(C \cap T)$

We know $n(P) = n(C) + n(T) - n(C \cap T)$

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

$\Rightarrow \quad 70 = 89 - n(C \cap T)$

$\Rightarrow \quad n(C \cap T) = 89 - 70$

$= 19$

Hence, 19 people like both coffee and tea.

********** END **********