MTH230 - Linear Algebra

Set Theory

A set is a well defined collection of objects. We have finite sets and infinite sets.

finite => An end exist.

infinite => An end does not exist.

An empty set is a set that has no element, and is doneted as phi ($\emptyset$)

$\in$ denotes member

$\notin$ denotes not a member or does not contain.

$5 \notin A$ => 5 is not a member of A.

Equal Sets: Sets that contain same elements.

Note: Order might be different.

Cardinality: This is the number of elements in a set.

If $A = \{1, 2, 3, 4, 5\}$

$n(A) = 5$

Where $n(A)$ => Cardinality of A.

Intersection: Given a set $A = \{a, b\}$

$B = \{c, a\}$

the intersection of A and B is the set of elements which exist in both sets. It is denoted by the symbol $\cap$.

$A \cap B = \{a\}$

This is because $\{a\}$ is the only element which exist in both A and B.

Union: The union of a set $A = \{a, b, c\}$ and $B = \{d, e, f\}$ is the set which contains all the values in both A and B. It is denoted by the symbol $\cup$

$A \cup B = \{a, b, c, d, e, f\}$

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13th May 2024

Power Set

$P(A) = 2^n$

Set $A = \{1, 2\}$

$P(A) = \{\{\emptyset\}, \{1\}, \{2\}, \{1, 2\}\}$

Union formula

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

$A = \{1, 2, 3\}$

$B = \{2, 4, 5\}$

At a certain conference of 100 people there were 29 Indian Women and 23 Indian men. Out of these indian people, 4 were Doctors, and 24 are either men or Doctors. There were no foreign Doctors find the number of Women Doctors who attended the Conference.

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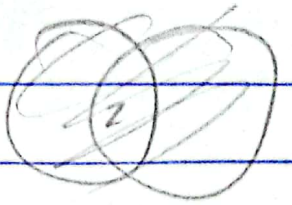


4 Doctors.

24 → men or Doctors or Both

Gathering:

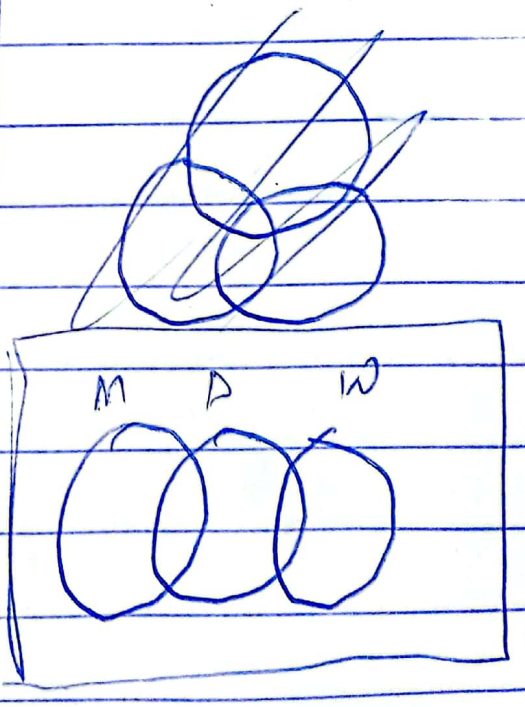
29 Indian women

23 Indian men

? 48 $n(M) = 23$

$n(W) = 29$

$n(M \cup D) = 24$



$24 = 4 + 23 - x$

$x = 3$

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