

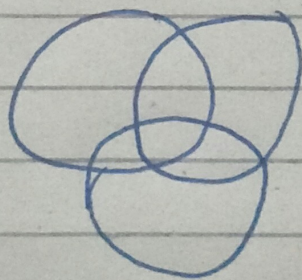
Hamid Khan
2nd Semester Section - A
Id = 15730

Q1 ans) Venn Diagram

A Venn diagram is a diagram that shows all possible logical relations between a finite collection of different sets. A Venn diagram consists of multiple overlapping closed curves, usually circles, each representing a set.

Application

They are used to show relationships - mainly similarities and differences - and visually organize information. A Venn diagram isn't just made up of circles, but also the area around the circles which encapsulates the data that doesn't fall into those categories.



Q2 ans) Union

A Union (\cup) of a collection of sets is the set of all elements in the collection. It is one of the fundamental operations through which sets can be combined and related to each other.

OR

The set made by combining the elements of two sets.

Membership Tables

Can combine sets in much the same way that we combined propositions

the set $A \cup (B \cap C)$. 1 denotes presence
0 denotes absence

| A | B | C | $B \cap C$ | $A \cup (B \cap C)$ |
|---|---|---|------------|---------------------|
| 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 |
| 0 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

A membership table can also be used to draw the Venn diagram by shading in all the regions that have a 1 in the final column

Q3 ans) Intersection

The intersection of 2 sets A and B, denoted by $A \cap B$, is the set containing all elements of A that also belong to B.

example:- elements 3 and 5 are common
[3, 5] is the intersection of set A and B.

Symbol for intersection of two sets is ' \cap ' therefore intersection of A and B is $A \cap B$.

| A | B | \bar{A} | \bar{B} | $A \cap B$ | $\overline{A \cap B}$ | $\bar{A} \cup \bar{B}$ |
|---|---|-----------|-----------|------------|-----------------------|------------------------|
| 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 |

$$\overline{A \cap B} = \bar{A} \cup \bar{B}$$

Q4ans) Set difference

The relative complement or set difference of sets A and B , denoted $A - B$ is the set of all elements in A that are not in B .

example:-

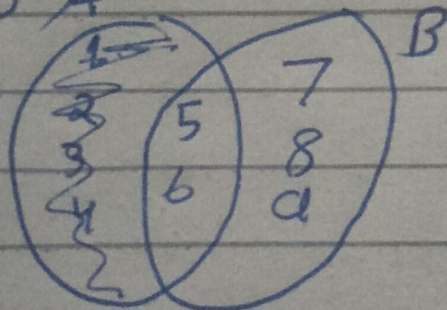
$$A = \{0, 1, 2, 3\}$$

$$B = \{2, 3\}$$

different set is $\{0, 1\}$

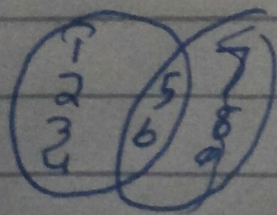
can write as $A - B$ or $A \setminus B$

$A - B$



shade "A"

$B - A$



shade B