

OBJECTIVES:

- ❖ Apply set operations.
- ❖ Construct Venn Diagrams.
- ❖ Interpret Venn Diagrams.

1. SET OPERATIONS: Look up and define the following terms.

- A. Intersection:
- B. Union:

2. WORKING WITH SET OPERATIONS

A. Susan's interests = { skydiving, bronco busting, chess } = S

Bert's interests = {wrestling, mountain climbing, chess} = B

Find $S \cap B$

B. Suppose $A = \{1, 2, 3, 4, 5, 6, 7\}$ and $B = \{2, 4, 6, 8, 10, 12\}$

Find $A \cap B$.

C. Find $A \cup B$.

D. Find $S \cup B$.

3. REASONING

A. If $A \cap B = B$, what is the relationship between A and B?

B. If $A \cup B = B$, what is the relationship between A and B?

C. TRUE OR FALSE

i. If $A \subseteq B$, then $B \subseteq A$.

ii.

ii. $A \cup \emptyset = \emptyset$

iii. $A \cap \emptyset = \emptyset$

iv. $0 \in \emptyset$

4. USING SET NOTATION SYMBOLS: Fill in the blank with the appropriate symbol: \in , \cup , \cap , or \subseteq .

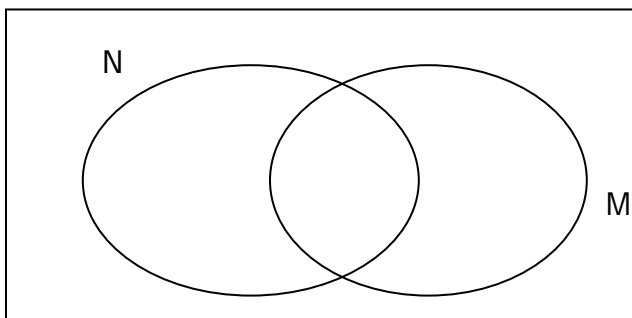
i. $\{3\}$ _____ $\{2, 3, 6\}$

ii. 8 _____ $\{7, 8, 9\}$

iii. $\{1, 2, 3\}$ _____ $\{2, 3, 6\} = \{2, 3\}$

iv. $\{1, 2, 3\}$ _____ $\{2, 3, 6\} = \{1, 2, 3, 6\}$

5. TWO SET VENN DIAGRAMS



Let $U = \{\text{All people who work for University Hospital}\}$

$N = \{\text{Nurses who work for University Hospital}\}$

$D = \{\text{Doctors who work for University Hospital}\}$

$M = \{\text{Males who work for University Hospital}\}$

a. Dr. Susan Adams

b. Dr. John Black

c. Ms. Alice Chen, who is a nurse.

d. Mr. Alan Drake, who is a nurse.

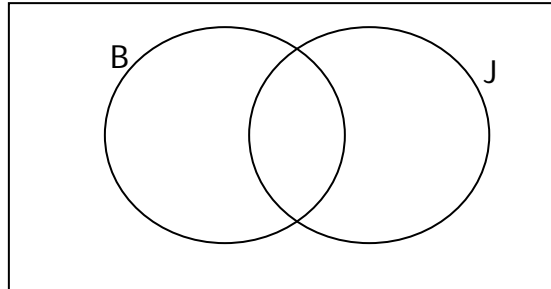
e. Ms. Nicole Polen, who is an x-ray technician.

Where does each person belong in the Venn Diagram? Place a, b, c, d, e in the proper region.

6. Examples:

A. A survey is taken of 300 college students about whether they eat breakfast and whether they have a job. Two hundred seventy eat breakfast, and 150 have a job. Twenty have a job and do not eat breakfast.

i. Draw a two-set Venn diagram that displays these results.



ii. How many students eat breakfast but do not have a job?

B. Suppose $P = \{\text{people who like prunes}\}$, $G = \{\text{people who like grapes}\}$, and $R = \{\text{people who like raspberries}\}$. The regions of a Venn diagram of sets P , G , and R are labeled 1 – 8.

Which region or regions would contain

i. people who like raspberries and grapes?

ii. People like raspberries and grapes but do not like prunes?

iii. people who like raspberries?

iv. people who like raspberries but not grapes?