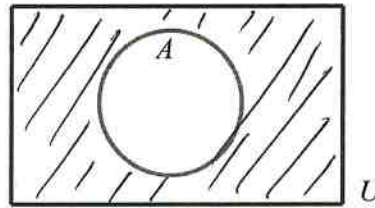


U: universal set or sample space



A is a set in U.



Shade A'
↑
not A

Ex: $U = \{1, 2, 3, 4, 5, 6, 7\}$

$A = \{2, 4, 6\}$

$B = \{1, 2, 3, 4\}$

$$U = \{x \mid 1 \leq x \leq 7, x \in \mathbb{Z}\}$$

$$B = \{x \mid 1 \leq x \leq 4, x \in \mathbb{Z}\}$$

such that $x \in A$ means x is in A

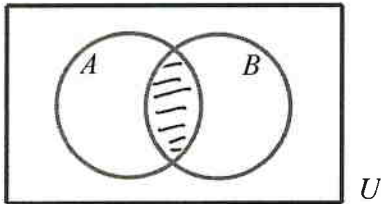
$$B = \{x \mid x < 5, x \in U\}$$

$n(A)$ = the number of elements of A

$$2 \in A$$

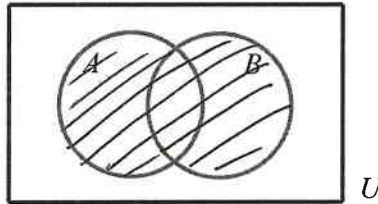
$$n(A) = 3$$

$A \cap B$ intersection (and)



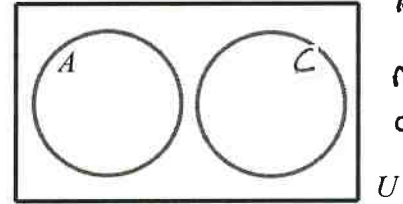
$$A \cap B = \{2, 4\}$$

$A \cup B$ union (or)



$$A \cup B = \{1, 2, 3, 4, 6\}$$

Disjoint or Mutually Exclusive



$$A \cap C = \emptyset$$

$$C = \{3, 5\}$$

$$\leftarrow \{ \}$$

the intersection is empty

Example

In a class of 30 students, 19 study Physics, 17 study Chemistry, and 15 study both. Make a Venn Diagram to represent this situation.

Find the probability that a randomly selected class member studies...

a. both Physics and Chemistry

$$\frac{15}{30} = \boxed{\frac{1}{2}}$$

b. at least one of these subjects

$$\frac{4 + 15 + 2}{30} = \frac{21}{30} = \boxed{\frac{7}{10}}$$

c. Physics but not Chemistry

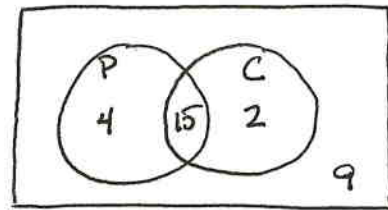
$$\frac{4}{30} = \boxed{\frac{2}{15}}$$

d. neither subject

$$\frac{9}{30} = \boxed{\frac{3}{10}}$$

e. exactly one of the subjects

$$\frac{4 + 2}{30} = \frac{6}{30} = \boxed{\frac{1}{5}}$$



HW 24H.1 (1-7)