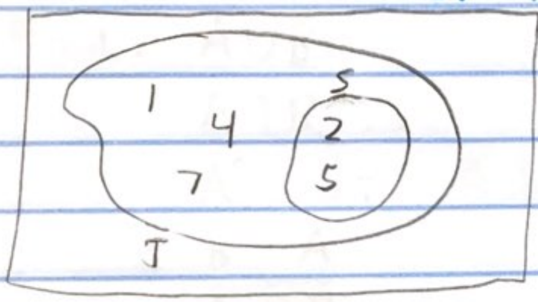
Subset

$S \subseteq T$ means every element of S is also in T



$T = \{1, 2, 5, 4, 7\}$

$S = \{2, 5\}$

$S \subseteq T$ because $2 \in T$, $5 \in T$

so $x \in S \Rightarrow x \in T$.

Note: $A \subseteq A \cup B$, $B \subseteq A \cup B$

$B \cap A \subseteq A$, $B \cap A \subseteq B$

$A - B \subseteq A$, $A \subseteq A$

$B - A \subseteq B$

Empty set : $\emptyset = \{\}$ For any A, $\emptyset \subseteq A$.

Power set : For any set A, $\mathcal{P}(A)$ is the set of all subsets of A.

Ex : $A = \{1, 3, 4\}$.

$$\mathcal{P}(A) = \{\emptyset, \{1\}, \{3\}, \{4\}, \{1,3\} \{1,4\}, \{3,4\}, \{1,3,4\}\}$$

A has 3 elements, $\mathcal{P}(A)$ is a set of sets which has $2^3 = 8$ elements

$|A| = 3$, $|\mathcal{P}(A)| = 8 = 2^{|A|}$

Problems: board

$U = \{1, \dots, 9\}$; $A = \{3, 5, 8\}$, $B = \{2, 3, 5, 7\}$

Find: $A \cup B$

$A \cap B$

$A^c \cup B = \bar{A} \cup B$; $\bar{A} \cap B$

$B - A$

$\overline{A \cap B}$

$\bar{A} \cup \bar{B}$

$$\overline{A \cup \left(\overline{\bar{B} \cap A}\right)}$$