



$$A \cap B \cap A \stackrel{?}{=} A \cap B$$

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

$$\underline{A \cap (B \cup A)} = \underline{(A \cap B) \cup A}$$

$$= A$$

$$\frac{(A \cap B) \cup (A \cap A)}{A}$$

$$(A \cup A) \cap (A \cup B)$$

$$A$$

$$= A \cap (A \cup B)$$

$$\begin{aligned} & ((A \cup B^c) \cap C)^c \cap (D \cap E)^c \\ &= ((A \cup B^c)^c \cup C^c) \cap (D^c \cup E^c) \\ &= ((A^c \cap B) \cup C^c) \cap (D^c \cup E^c) \end{aligned}$$

$$\left| \begin{aligned} & (A^c \cap D) \cup C^c \cap D^c \cup \\ & ((A^c \cap B) \cup C^c) \cap E^c \end{aligned} \right.$$

A set. Power Set $\mathcal{P}(A)$ = set of all subsets

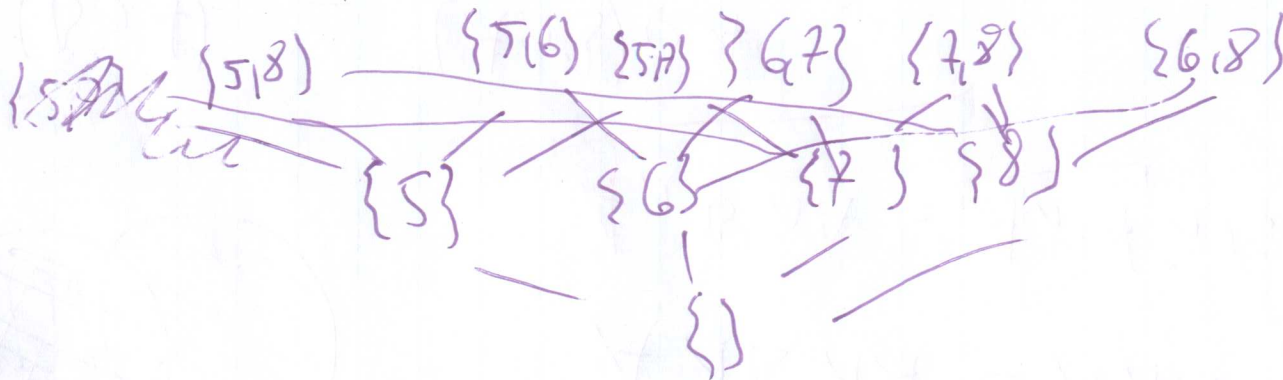
$$A = \{1, 2\}, \quad \mathcal{P}(A) = \{\emptyset, \{1\}, \{2\}, \{1, 2\} = A\}$$

$$\text{If } \#A = k$$

$$\Rightarrow \#\mathcal{P}(A) = 2^k$$

$$\{1\} \quad \{2\}$$

$$\{\}$$



(a, b)

encode

 $\{a, \{a, b\}\}$ $(1, 3) \neq (3, 1)$ $(1, 1)$

Pairs

 $\{1, 3\} = \{3, 1\}$ $(3, 7, 1)$
[]

3-Tuple

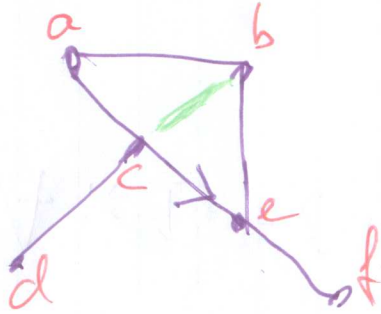
 $t = (5, 3, 9)$

pos: 1 2

 $t \in []$ $t_1 = 5$

index

 $t_2 = 3$ $t_3 = 9$ Cartesian Product:Sets A, B $A \times B = \{ (a, b) \mid a \in A, b \in B \}$ Ex. $A = \{1, 2, 3\}$, $B = \{5, 6\}$ $A \times B = \{(1, 5), (1, 6), (2, 5), (2, 6), (3, 5), (3, 6)\}$



Possible connections:

$(a, b), (b, a), (c, d), (d, c)$

$(a, c), (c, a), (c, e), (b, e), (e, b)$

$(e, f), (f, e)$

$$A = \{ \underline{1}, \underline{2}, a, b, c \}$$