

Comp 0147: Discrete Math for Comp. Scientists

Foundations:

- Sets theoretic notation
- Functions, Permutations
- Euclid's algorithm

Core Concept:

- Linear Algebra
- Counting

Set Notations:

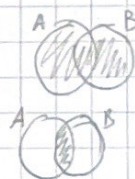
- $A = \{a, b, c\}$, $d \in A$: d is element that sits inside "bag" A
- Empty set \emptyset : bag with NO elements \downarrow pointer
- Set $A = B$
- Need to prove:

a) $A \subseteq B$: A subset of B

b) $B \subseteq A$: B subset of A

Set Operations

- Union: $A \cup B = \{x \mid (x \in A) \vee (x \in B)\}$
- Intersection: $A \cap B = \{x \mid (x \in A) \wedge (x \in B)\}$



Cartesian product:

$$A \times B = \{(x, y) \mid (x \in A) \wedge (y \in B)\}$$

- Difference: $A \setminus B = \{x \mid (x \in A) \wedge (x \notin B)\}$



Symmetric difference:

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



Complement of set A :

$$A^c = U \setminus A = \{x \mid (x \in U) \wedge (x \notin A)\}$$



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