

Sets

- A set A is a collection of objects.
- $a = \text{element} \in A$; $a \notin A$.
- $\phi = \text{empty set}$.

• $A \cup B = \{x : x \in A \text{ or } x \in B\}$.

• $A \cap B = \{x : x \in A \text{ and } x \in B\}$
intersection.

• $A^c = \{x \in E : x \notin A\} = C_E^A$
complementary.

• $(A \cup B) \cup C = A \cup (B \cup C)$

• $A \times B = \{(a, b), a \in A, b \in B\}$. product of A and B

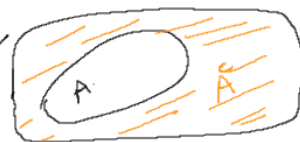
• Order: $A \subset B \Leftrightarrow (\forall a \in A \Rightarrow a \in B)$.

$A \subset A$.

$A \subset B$ and $B \subset C \Rightarrow A \subset C$.



Union.



$$A = \{1, 2, 3\}$$

$$B = \{2, 4, 5\}$$

$$C = \{7\}$$

$$A \cup B = \{1, 2, 3, 4, 5\}.$$

$$E = A \cup B \cup C$$

$$= \{1, 2, 3, 4, 5, 7\}.$$

$$A \cap B = \{2\}.$$

$$C_E^E = \{x \in E : x \notin C\} = \{1, 2, 3, 4, 5\}.$$

$$A \times C = \{(1, 7), (2, 7), (3, 7)\}.$$

$$C \times B = \{(7, 2), (7, 4), (7, 5)\}.$$

• $A \cap C = \phi$; $A \cap B = \phi$; $E \cap C = C$.

• $C \subset E$: $C \not\subset A$; $C \not\subset B$.

• $(A \cap B) \cup C = \{2\} \cup \{7\} = \{2, 7\}.$