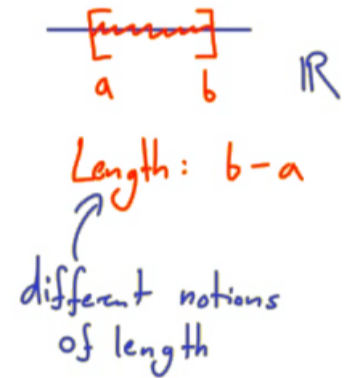
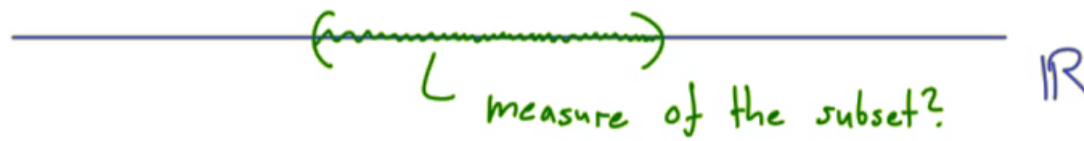




# Measure theory - Part 1



$X$  set

$P(X)$  power set  $X$

Example:  $X = \{a, b\}$ ,  $P(X) = \{\emptyset, X, \{a\}, \{b\}\}$

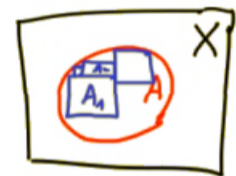
Definition:  $\mathcal{A} \subseteq P(X)$  is called a  $\sigma$ -algebra:

(a)  $\emptyset, X \in \mathcal{A}$

(b)  $A \in \mathcal{A} \Rightarrow A^c := X \setminus A \in \mathcal{A}$

(c)  $A_i \in \mathcal{A}, i \in \mathbb{N} \Rightarrow \bigcup_{i=1}^{\infty} A_i \in \mathcal{A}$

$A \in \mathcal{A}$  is called a  $\mathcal{A}$ -measurable set.



Example: (1)  $\mathcal{A} = \{\emptyset, X\}$

(2)  $\mathcal{A} = P(X)$