Events	Sets	Symbol
event	set	E
certain event	sample space	Ω
impossible event	empty (null) set	$\emptyset$
implies	inclusion (subset)	$E_1 \subseteq E_2$
equality	equality	$\text{if } \begin{cases} E_1 \subseteq E_2 \\ \text{and} \\ E_2 \subseteq E_1 \end{cases} \Rightarrow E_1 = E_2$
complement	complement	$\overline{E}$ $E \cup \overline{E} = \Omega$ $\overline{\Omega} = \emptyset, \overline{\emptyset} = \Omega$
logical product	intersection	$E_1 \cap E_2$
logical sum	union	$E_1 \cup E_2$
incompatible events	disjoint sets	$E_1 \cap E_2 = \emptyset$
complete class	complete set	$\begin{cases} E_i \cap E_j = \emptyset \ \forall i \neq j \\ \bigcup_i E_i = \Omega \end{cases}$

During the lecture we used the symbol S instead of Ω !

a)

Ω

E $\overline{E}$

$E \cup \overline{E} = \Omega$

b)

Ω

A B

$A \subset B$

c)

Ω

A C B

D

$C = A \cap B$
$D = \overline{A \cup B} = \overline{A} \cap \overline{B}$

d)

Ω

A C B

$\overline{C} = \overline{A \cap B} = \overline{A} \cup \overline{B}$

e)

Ω

B

E A D C

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
$D = A \cap B \cap C; \qquad E = \overline{A \cup B \cup C}$

f)

Ω

B

A C

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

g)

Ω

E_i

E_1

E_n

E_2

$\bigcup_{i=1}^{n} E_i = \Omega$
$E_i \cap E_j = \emptyset \quad \vee_{i,j}$

h)

Ω

E_i

E_1 F E_n

E_2

$F = \bigcup_{i=1}^{n} (F \cap E_i)$