

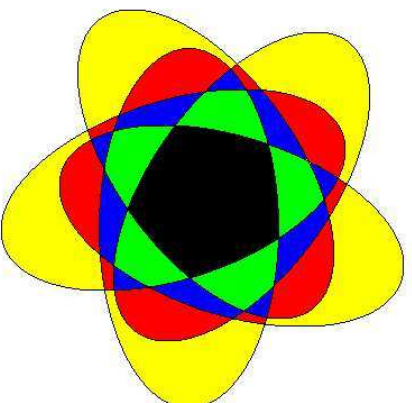
# Kapittel 2: Sannsynlighet [2.1-2.2]

TMA4240 Statistikk (F2 og E7)

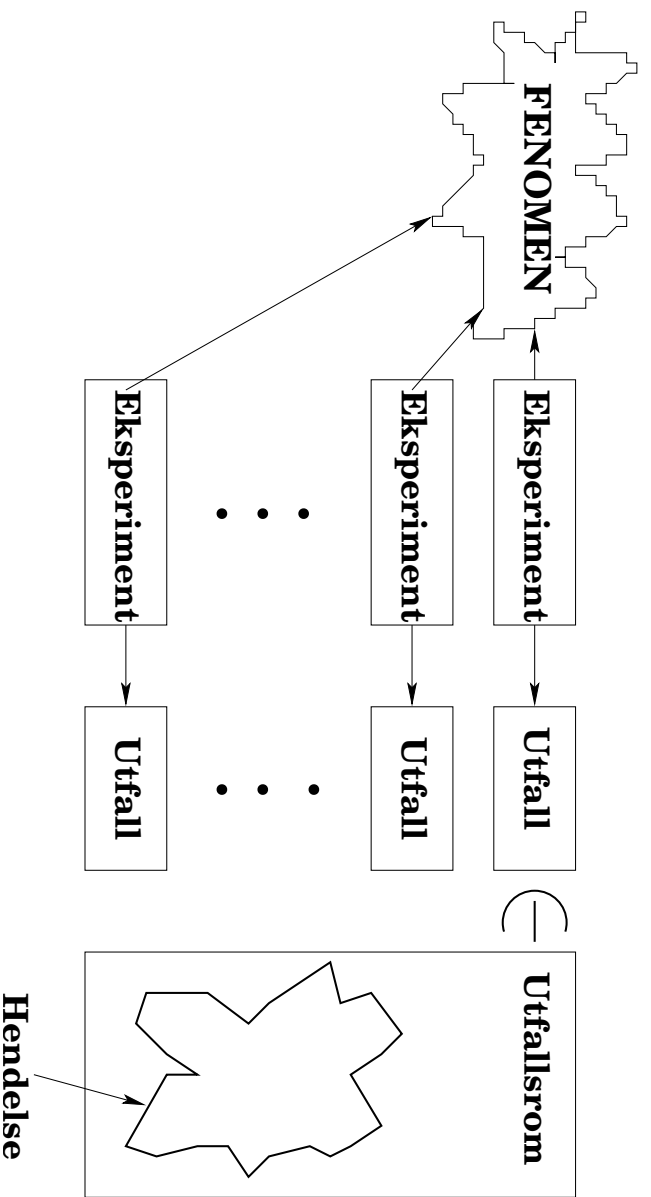
2.1 og 2.2: Utfallsrom og hendelser [16.august 2004]

2.3, 2.4, 2.5: Kombinatorikk og sannsynlighet [18.august 2004]

2.6, 2.7, 2.8: Betinget sannsynlighet [23.august 2004]



Ole.Petter.Lodoen@math.ntnu.no – p.1/8



# Utfallsrom og hendelser

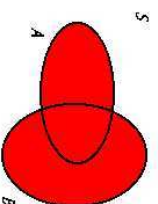
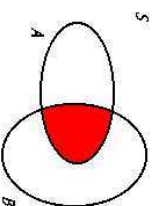
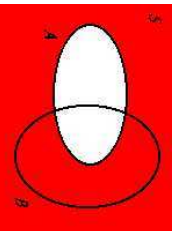
**DEF 2.1 Utfallsrom:** mengden av alle mulige resultater (utfall) av et stokastisk forsøk.

**DEF 2.2 Hendelse:** delmengde av utfallsrommet.

**DEF 2.3  $A^c$ =Komplementet til en hendelse  $A$ :** (også brukt  $A^*$ ,  $A^c$ ,  $\bar{A}$ ) alle utfall i  $S$  som ikke er i  $A$ .  $A^c = \{e \in S \mid e \notin A\}$ .

**DEF 2.4:  $(A \cap B)$ =Snittet av to hendelser  $A$  og  $B$ :** alle utfall som både er i  $A$  og i  $B$ .

**DEF 2.6:  $(A \cup B)$ =Unionen av to hendelser  $A$  og  $B$ :** alle utfall som er i  $A$  eller i  $B$  eller i begge.

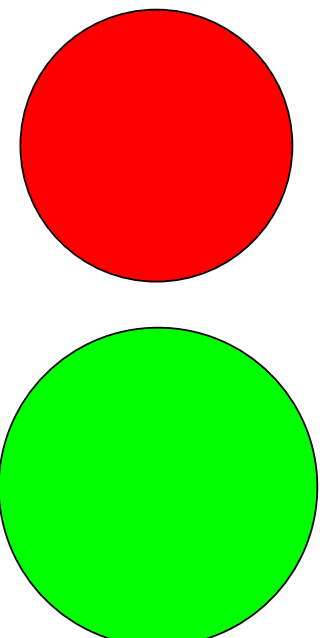


# Disjunkte hendelser

(mutually exclusive)

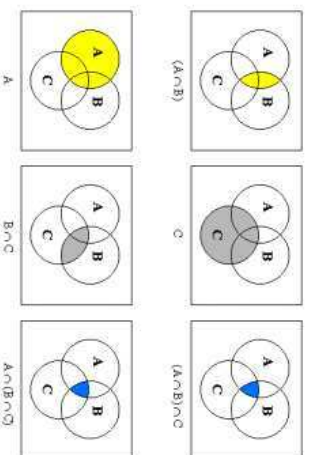
• **DEF 2.5:** To hendelser  $A$  og  $B$  er **disjunkte** hvis snittet er tomt:  $A \cap B = \emptyset$ .

• Viktig egenskap når vi skal regne med sannsynligheter for hendelser (og ofte på eksamen skal man vise om to hendelser er disjunkte!)

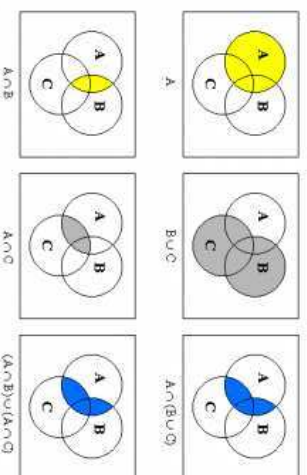


# Regneregler

- Kommutativ lov:  $A \cup B = B \cup A$
- Assosiativ lov:  $(A \cap B) \cap C = A \cap (B \cap C)$

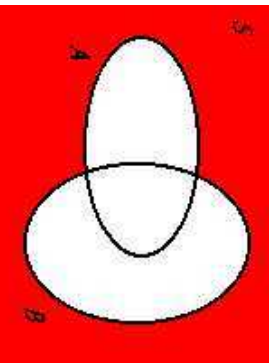


- Distributiv lov:  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

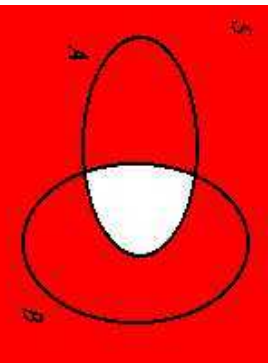


# De Morgans lov

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

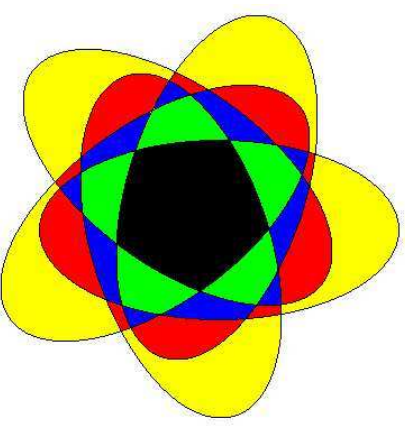
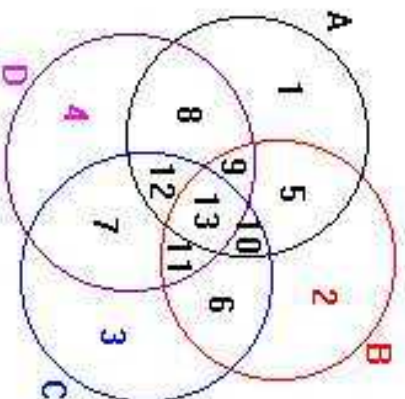
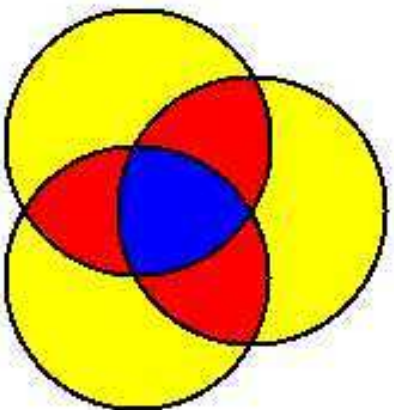


- $(A \cap B)' = A' \cup B'$

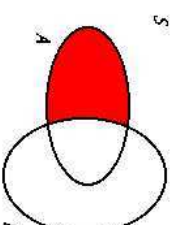
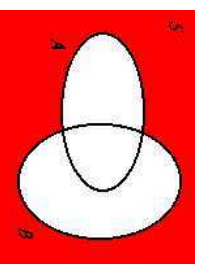
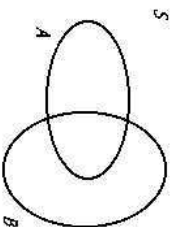


# Multihendelser

- La  $S$  være utfallsrom og
- $A_1, A_2, \dots, A_n \subset S$ ,  $n$  hendelser.
- Minst en hendelse:  $A_1 \cup A_2 \cup \dots \cup A_n = \bigcup_{i=1}^n A_i$
- Alle hendelser:  $A_1 \cap A_2 \cap \dots \cap A_n = \bigcap_{i=1}^n A_i$



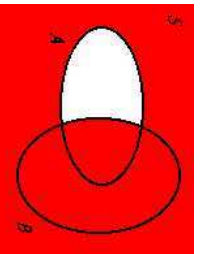
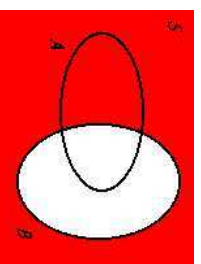
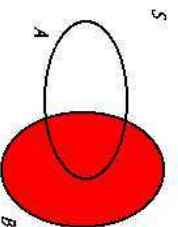
## Hva er de fargelagte områdene?



1.....

2.....

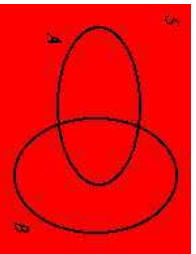
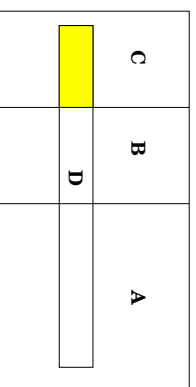
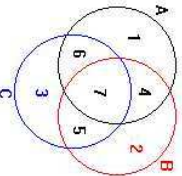
3.....



4.....

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6.....



7.....

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9.....