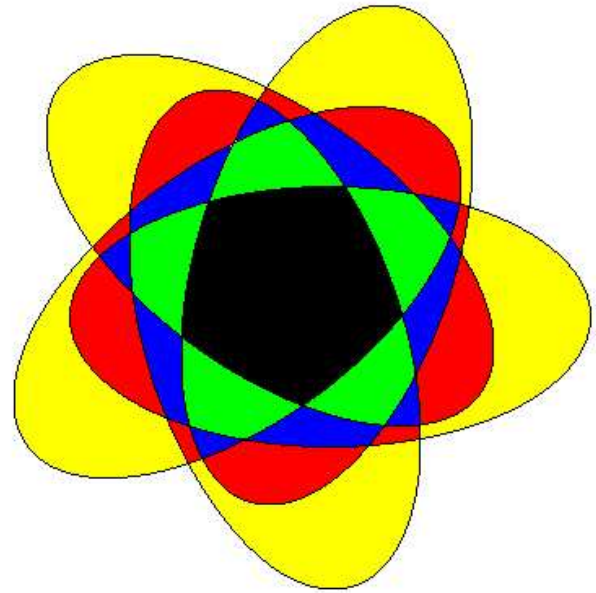
Kapittel 2: Sannsynlighet [2.1-2.2]

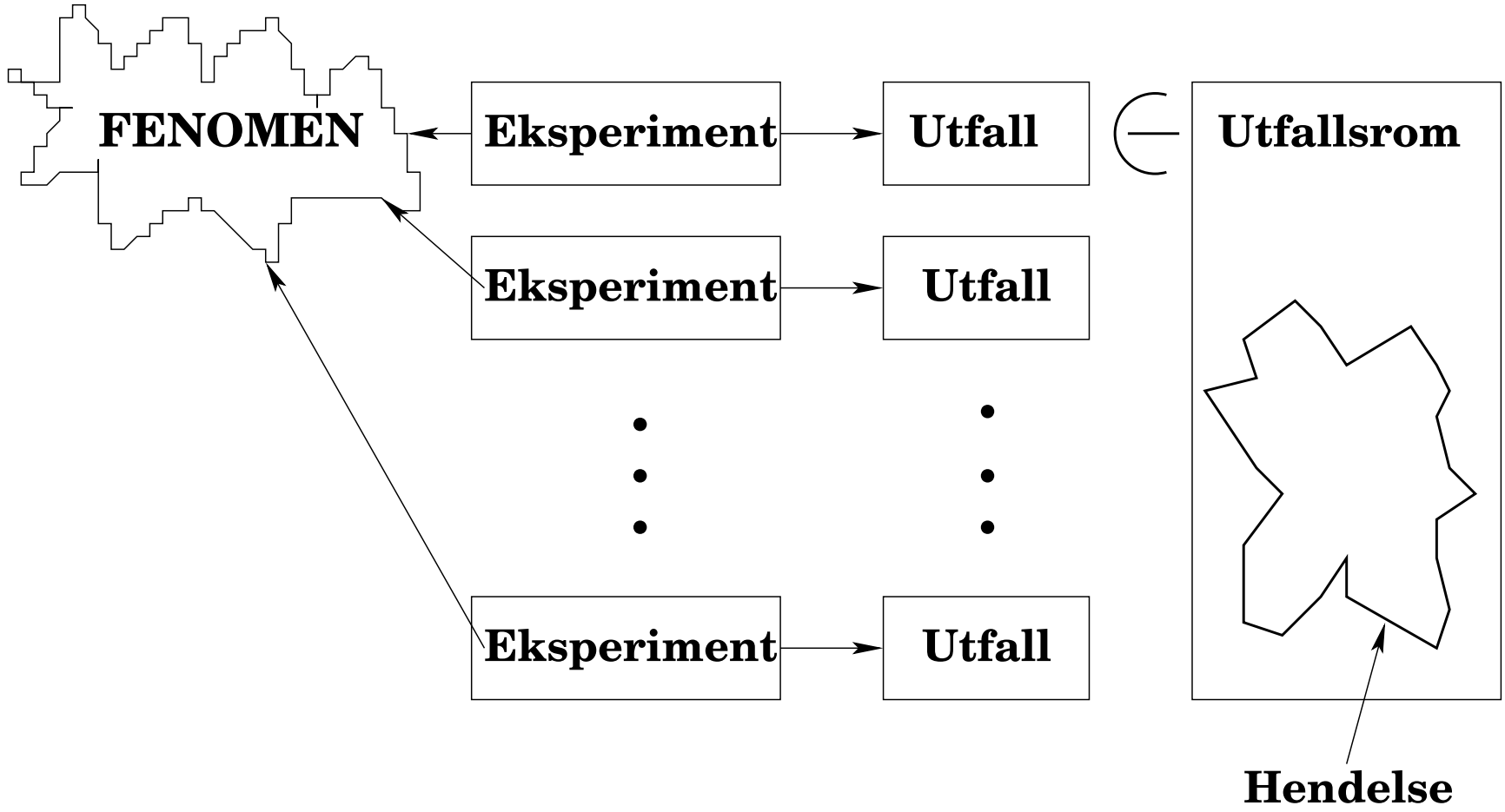
TMA4240 Statistikk (F2 og E7)

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]




FENOMEN
Eksperiment
Utfall
Eksperiment
Utfall
Eksperiment
Utfall
Utfallsrom
Hendelse

Utfallsrom og hendelser

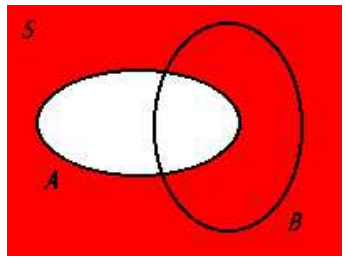
DEF 2.1 Ufallsrom: mengden av alle mulige resultater (utfall) av et stokastisk forsøk.

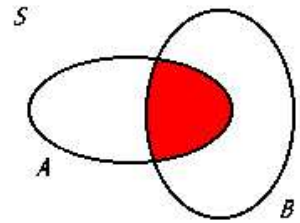
DEF 2.2 Hendelse: delmengde av utfallsrommet.

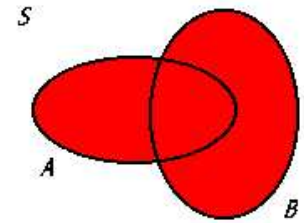
DEF 2.3 A'=Komplementet til en hendelse A: (også brukt A^*, A^c, $\overline{A}$) alle utfall i S som ikke er i A. A'=$\{e \in S | e \notin A\}$.

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.



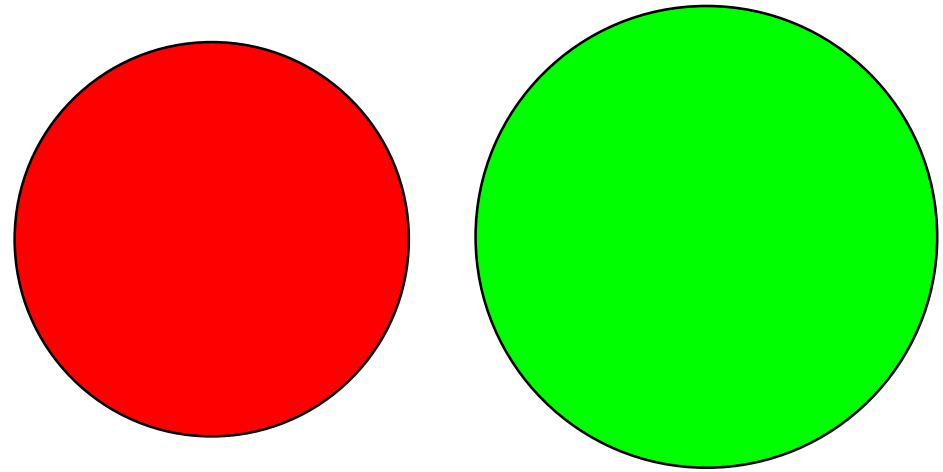




Disjunkte hendelser

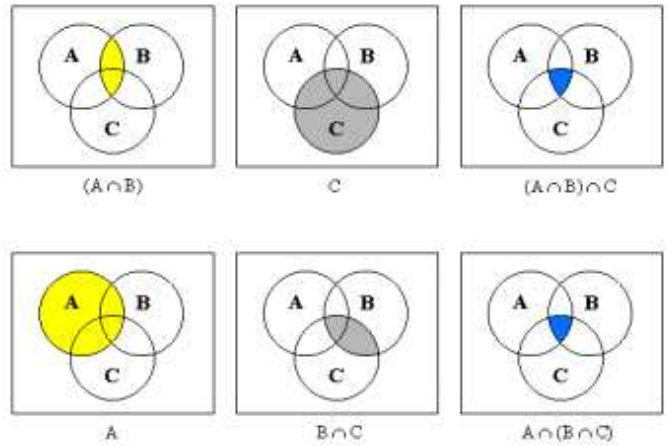
(mutually exclusive)

- **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!)

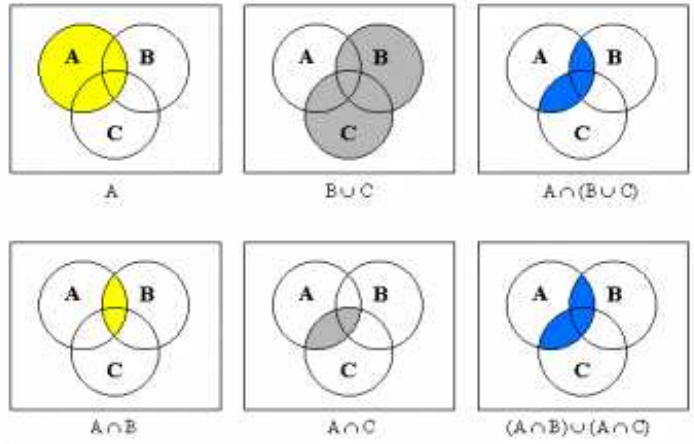


Regneregler

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

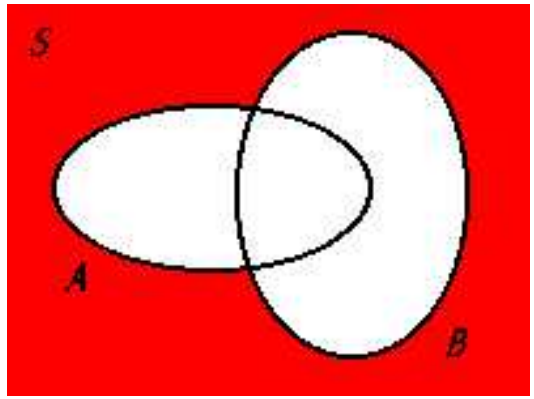


- Distributiv lov: $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

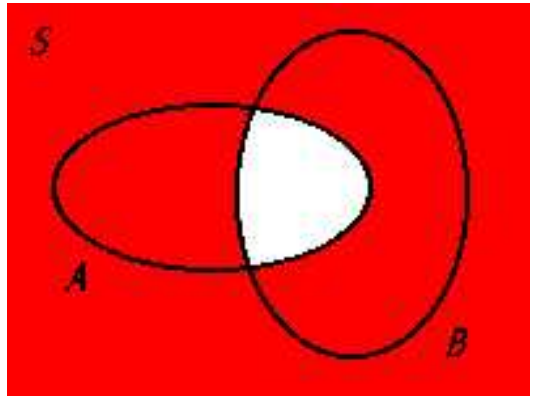


De Morgans lov

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

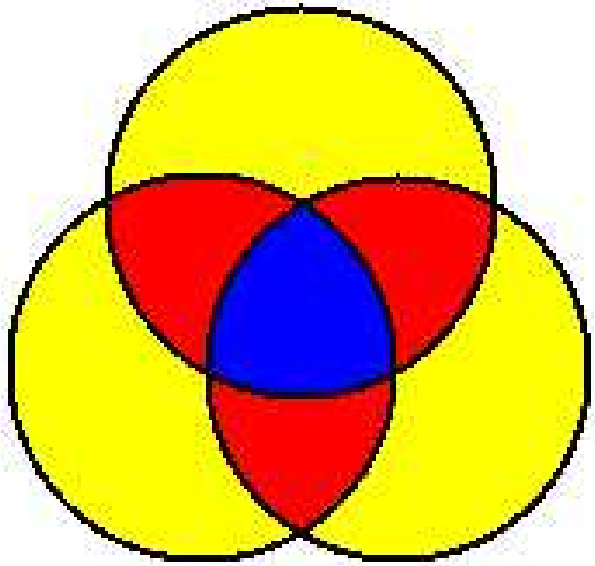


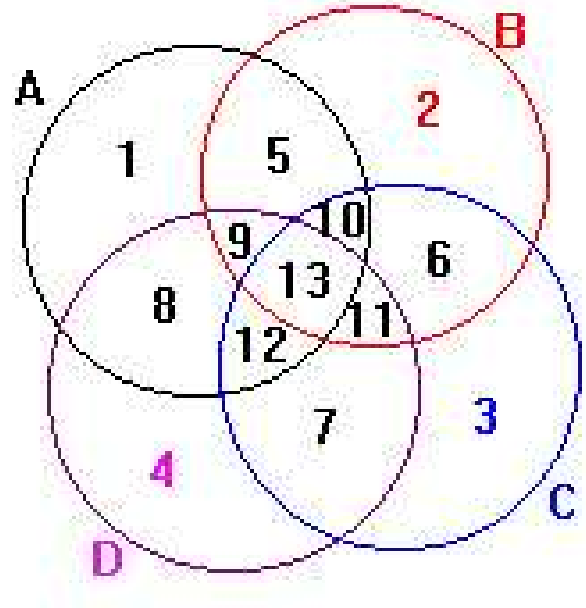
- $(A \cap B)' = A' \cup B'$

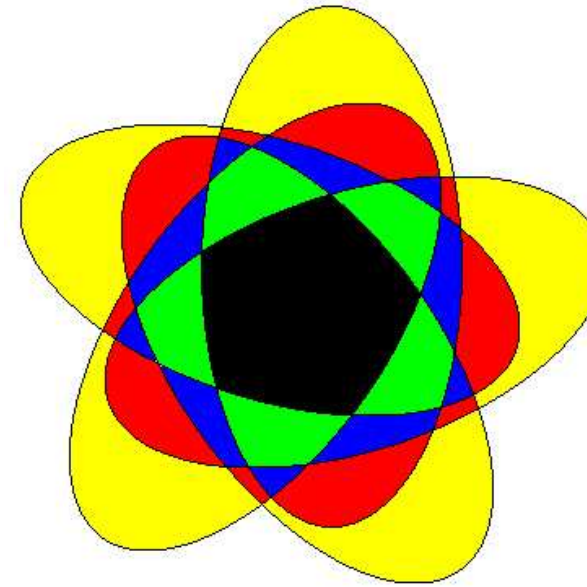


Multihendelser

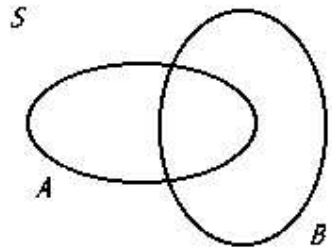
- La S være utfallsrom og
- $A_1, A_2, ..., A_n \subset S$, n hendelser.
- Minst en hendelse: $A_1 \cup A_2 \cup \cdots A_n = \cup_{i=1}^{n} A_i$
- Alle hendelser: $A_1 \cap A_2 \cap \cdots A_n = \cap_{i=1}^{n} A_i$







Hva er de fargelagte områdene?



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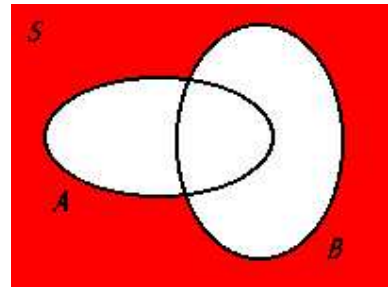

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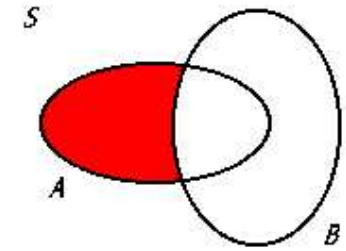

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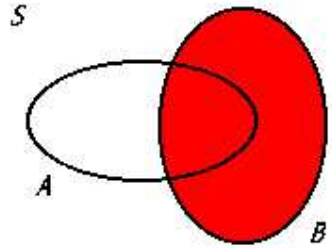

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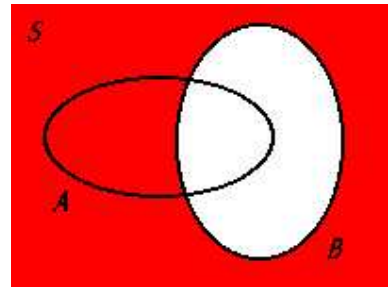

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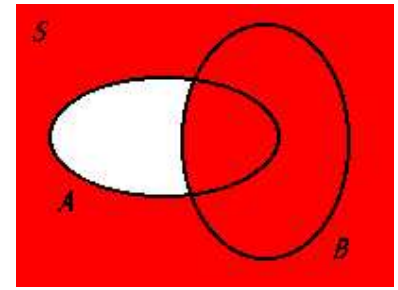

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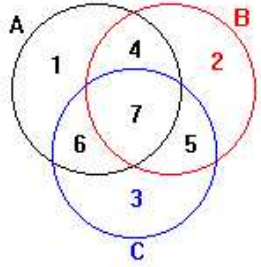

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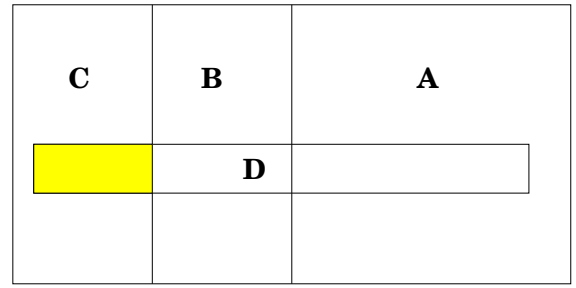

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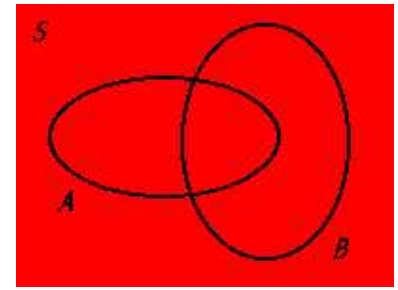

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