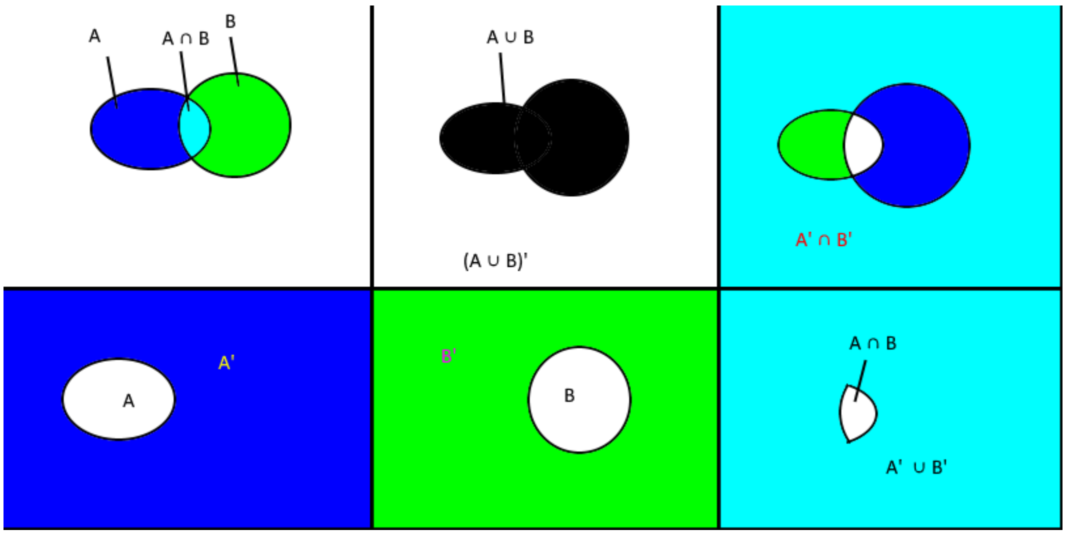
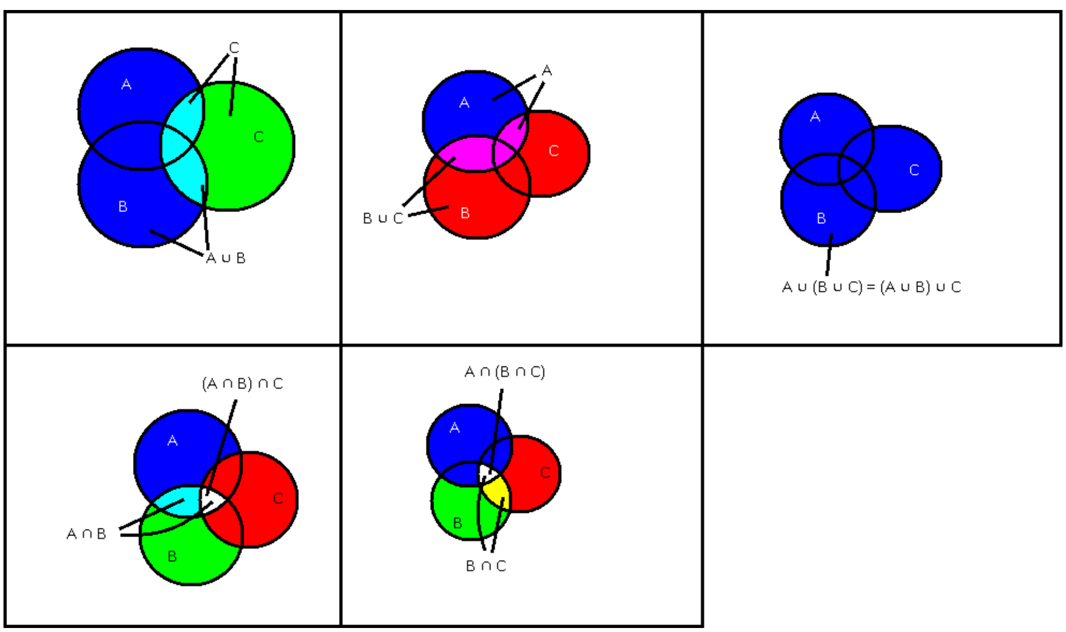
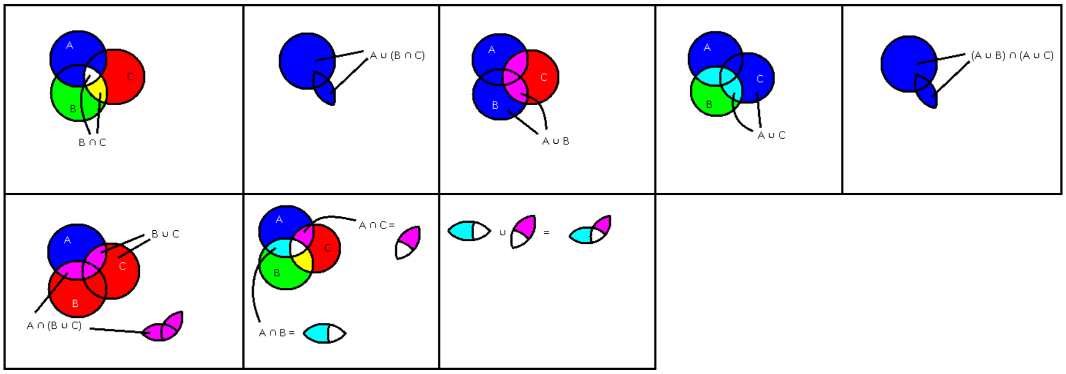
Øving 1

Oppgave 1



de Morgans lov





Oppgave 2

$$\binom{8}{7} = \frac{8!}{1! \cdot 7!} = 8$$
$$\binom{m}{7} = \frac{m!}{7!(m-7)!}$$
$$3kr \cdot \binom{12}{7} = \frac{12!}{7! \cdot 5!} = 2376kr$$

Oppgave 3

$$B = bildekort$$
$$E = ess$$
$$Bj = blackjack$$
$$P(Bj) = P(B) \cdot P(E) \cdot 2 = \frac{16}{52} \cdot \frac{4}{52} \cdot 2 = 4.73\%$$

$$P(Bj|E) = \frac{16}{52} = 30.8\%$$

$$P(Bj) = 0.06, \quad P(E) = 0.1, \quad P(E|Bj) = 0.4$$
$$P(Bj|E) = P(E|Bj)\frac{P(Bj)}{P(E)} = 0.4 \cdot \frac{0.06}{0.1} = 24\%$$

Oppgave 4

a)

$$P(E_1) = P(E_2) = 0.01, \quad P(E_2|E_1) = 0.1$$

$$P(E_2|E_1) \neq P(E_2) => ikke\ uavhengig$$

$$P(E_2|E_1) = \frac{P(E_2 \cap E_1)}{P(E_1)} \neq 0 => ikke\ disjunkte$$

$$P(E_2 \cap E_1) = P(E_1) \cdot P(E_2|E_1) = 0.01 \cdot 0.1 = 0.001$$
$$P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2) = 0.01 + 0.01 - 0.001 = 0.019$$

b)

$$ikke\ tilstrekkelig\ kapasitet = F = (T \cap (E_1 \cup E_1)) \cup \left(\bar{T} \cap E_1 \cap E_2\right)$$

$$P(F) = P(T \cap (E_1 \cup E_1)) + P(\bar{T} \cap E_1 \cap E_2)$$

$$P(T \cap (E_1 \cup E_1)) = P(T) \cdot P(E_1 \cup E_2) = 0.04 \cdot 0.019 = 0.00076$$
$$P(\bar{T} \cap E_1 \cap E_2) = (1 - P(T)) \cdot P(E_1 \cap E_2) = 0.96 \cdot 0.001 = 0.00096$$
$$P(F) = 0.00076 + 0.00096 = 0.00172$$

Oppgave 5

$$P(J) = 0.8, \quad P(\bar{J}) = 0.2, \quad P(R|J) = 0.02, \quad P(R|\bar{J}) = 0.05$$

$$P(J \cap R) = P(J) \cdot P(R|J) = 0.8 \cdot 0.02 = 0.016$$
$$P(\bar{J} \cap R) = P(\bar{J}) \cdot P(R|\bar{J}) = 0.2 \cdot 0.05 = 0.01$$

$$\frac{0.016}{0.01 + 0.016} = 61.5\%\ av\ innringere\ som\ mener\ ja$$

Oppgave 6

$$P(A \cap B) = P(B) \cdot P(A|B) = 0.09 \cdot 0.5 = 0.045$$

$$P(A \cap \bar{B}) = P(\bar{B}) \cdot P(A|\bar{B}) = 0.91 \cdot 0.01 = 0.0091$$
$$P(A) = P(A \cap B) + P(A \cap \bar{B}) = 0.045 + 0.0091 = 0.0541$$

$$P(B|A) = P(A|B) \cdot \frac{P(B)}{P(A)} = 0.5 \cdot \frac{0.09}{0.0541} = 0.8312$$