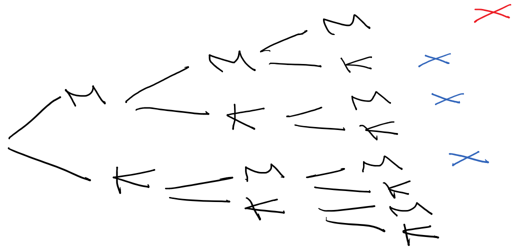
Opg 9

$2 \cdot 2 \cdot 2$ muligheter



b) $P(\text{tre mynt}) = \frac{1}{8}$

c) $P(2 \text{ mynt}) = \frac{3}{8}$

d) $P(\text{minst to mynt}) = \frac{1}{8} + \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$

$$\boxed{P(A \cup B) = P(A) + P(B) - P(A \cap B)}$$

Oppg 11

bloodtype AB

$$U = \{A, B, C, O\}$$

$$P(A) = 48\%$$

$$P(B) = 8\%$$

$$P(C) = 4\%$$

$$P(O) = 40\%$$

$$P(C \cup B) = P(B) + P(C) = 12\%$$

$$P(\overline{A}) = 1 - P(A) = 1 - 48\% = 52\%$$

Thursday, March 12, 2015 10:56 AM

Oppg 16

3 røde kuler

2 hvite kuler

Produktsetn

$P(A \cap B) = \cancel{P(A)} \cdot$

$= P(A) \cdot P(B \mid A)$

nj

$P(RR) = \frac{3}{5} \cdot \frac{2}{4} = \frac{6}{20} = \frac{3}{10}$ uten tilbakelegging

$P(RR) = \frac{3}{5} \cdot \frac{3}{5} = \frac{9}{25}$

oppg 24 A

A = nøyaktig én kron

B = mynt i første kast.

$A = \{KMM, MKM, MMK\}$ $\quad 3/8$

$B = \{MMM, MMK, MKM, MKK\}$ $\quad 4/8 = \frac{1}{2}$

$A \cup B = \{MMM, MMK, MKM, MKK, KMM\}$ $\quad \frac{5}{8}$

$A \cap B = \{MKM, MMK\}$ $\quad \frac{2}{8} = \frac{1}{4}$

$$P(A \cup B) = \frac{5}{8}$$

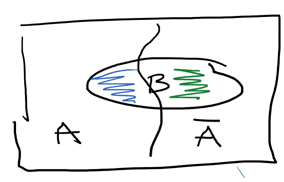
$$P(A) + P(B) - P(A \cap B) = \frac{3}{8} + \frac{4}{8} - \frac{2}{8} = \frac{5}{8}$$

Bestemme $P(\bar{A} \cap B)$

$$P(A \cap B) + P(\bar{A} \cap B) = P(B)$$

$$P(\bar{A} \cap B) = P(B) - P(A \cap B)$$

$$= \frac{4}{8} - \frac{2}{8} = \frac{2}{8} = \frac{1}{4}$$



$$B = (A \cap B) \cup (\bar{A} \cap B)$$

$$P(B) = P(A \cap B) + P(\bar{A} \cap B)$$

Oppg 26 25 elever

10 elever har fransk
12 elever har tysk
4 elever har både fransk og tysk

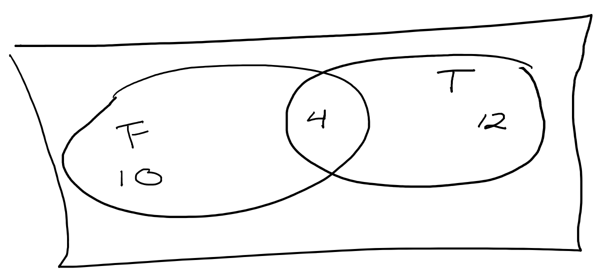
forsøk: trekke en elev tilfeldig
F = eleven har fransk 10/25
T = elen har tysk 12/25

$F \cap T$ 4/25

$$P(F|T) = \frac{4/25}{12/25} = \frac{4}{12} = \frac{1}{3}$$

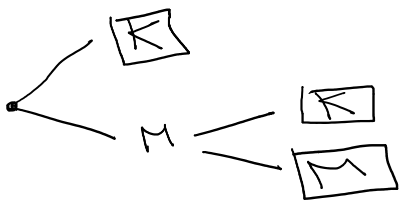
$$\boxed{\begin{aligned} P(F \cap T) &= P(T) \cdot P(F|T) \quad \Big| \cdot \frac{1}{P(T)} \\ P(F|T) &= \frac{P(F \cap T)}{P(T)} \end{aligned}}$$

$$P(T|F) = \frac{P(F \cap T)}{P(F)} = \frac{4/25}{10/25} = \frac{4}{10} = \frac{2}{5}$$



Oppg 13

utfallsrom



$$U = \{K, MK, MM\}$$

$P(K) = \frac{1}{2}$

$P(MK) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

$P(MM) = \frac{1}{4}$

ikke uniform!

b) A = "spilleren vinner" $= \{K, MK\}$

$$P(A) = \underbrace{\frac{1}{2} + \frac{1}{4}}_{P(K)+P(MK)} = \underline{\underline{\frac{3}{4}}}$$

Oppg 14

$U = \{1, 2, 3, 4, 5, \ldots\}$

$P(k)$ = sannsynligheten for at vi får krone førstegang i kast nr k.

$$P(k) = \underbrace{\left(\frac{1}{2}\right)\cdot\left(\frac{1}{2}\right)\cdots\left(\frac{1}{2}\right)}_{k \text{ ganger}} = \left(\frac{1}{2}\right)^k$$

i) $P(k) > 0$, $P(k) < 1$ ✓

ii) $\sum_{k=1}^{\infty} P(k) = 1$.

dette holder fordi $\sum_{k=1}^{\infty} \left(\frac{1}{2}\right)^k = \frac{\frac{1}{2}}{1 - \frac{1}{2}} = \ldots = 1$ ✓

c) A = "høyst 4 kast"

$= \{1, 2, 3, 4\}$

$$P(A) = P(1) + P(2) + P(3) + P(4)$$

$$= \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} = \underline{\underline{\frac{15}{16}}}$$

$$S_N = \sum_{k=1}^{N} a^k$$

$$S_N = a + a^2 + \dots + a^N$$

$$aS_N = a^2 + a^3 + \dots + a^{N+1}$$

$$aS_N - S_N = a^{N+1} + a^N + a^{N-1} + \dots a^3 + a^2$$
$$- a^N + a^{N-1} - \dots - a^3 - a^2 - a$$
$$= a^{N+1} - a$$

$$(a-1) S_N = a^{N+1} - a \qquad \text{ligning}$$

$$S_N = \frac{a^{N+1} - a}{a-1} =$$

hvis $a \in (0,1)$

$$\lim_{N\to\infty} S_N = \lim_{N\to\infty} \frac{a^{N+1} - a}{a-1} = \frac{-a}{a-1} = \frac{a}{1-a}$$

$a^{N+1} \to 0$