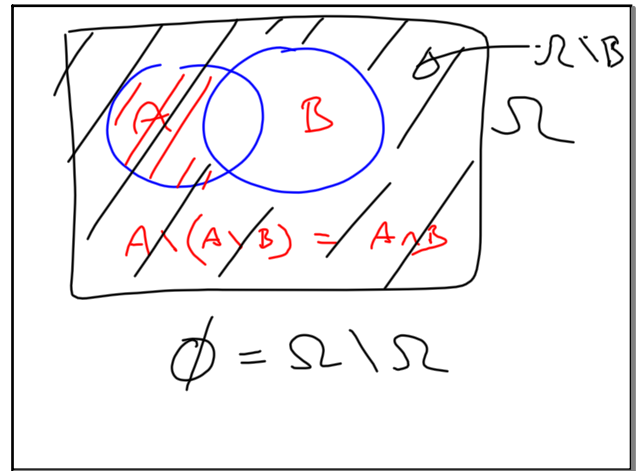


p_1, p_2, \dots, p_6
 $\sum_{i=1}^6 p_i = 1 \quad \forall p_i \geq 0$

Beispiel:
 $\Omega = \{1, 2, 3, 4, 5, 6\}$
 $\omega_i = i \quad (i=1, \dots, 6)$
 $\mathcal{A} = 2^{\Omega}$ *mögliche V&A;e*

9 24-15:58



9 24-16:16

$A \ni A \xrightarrow{!} P(A)$

$$P(A) = \frac{|A|}{|\Omega|}$$

$A \cap B = \emptyset \Rightarrow |A \cup B| = |A| + |B|$
 $\Rightarrow \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B|}{|\Omega|}$
 $= P(A) + P(B)$

9 24-16:21

$A^c = \Omega \setminus A \Rightarrow |A^c| = |\Omega| - |A|$
1.55 \Rightarrow

1.56 8 musici 4 sing \rightarrow 5 song
 S gleich Verteilbarkeit: # Feu ≥ 3 ?
 1 musici $= 8$
 $= \binom{8}{2} \binom{6}{3} = 28 \cdot 4 = 112$
 2 musici $= 120$ $\leftarrow 8 + 112$

$$P = \frac{120}{\binom{12}{5}}$$

9 24-16:25

1.46 *zwei m&A;e*
 m &A;e *unabhängig*
 n &A;e *unabhängig*
 S gleich verteilbarkeit: *wird nicht nur*

Beispiel: $(2n)! = |\Omega|$
 $|A| = 2(n!) \cdot (n!) = 2(n!)^2$
 $P(2) = \frac{8}{24} = \frac{1}{3}$ ✓
 $P(5) = 0,0079 \quad P(8) = 0,00016$

9 24-16:37

1.51 $\Omega \dots$ *keine* *W&A;e* *es* *denke* *dass*
keine *W&A;e* *es* *denke* *dass*
keine *W&A;e* *es* *denke* *dass*
Beispiel: $\Omega = \{ \text{permutationen} \}$
 $\Omega = \{(1), (1,2), (1,2,3), \dots\}$
 $A_i = \{ \text{permutationen mit } i \}$
 $A_i = (a_1, a_2, \dots, a_n, i)$
 $A_{100} = (a_1, \dots, a_{100})$
 $P(A_1) = \frac{1}{6}$
 $P(A_2) = \frac{5}{6} \cdot \frac{1}{6} = \frac{5}{36}$
 $P(A_3) = \left(\frac{5}{6}\right)^2 \cdot \frac{1}{6} = \frac{25}{216}$
 $P(A_k) = \left(\frac{5}{6}\right)^{k-1} \cdot \frac{1}{6}$
 $P(A_{100}) = \left(\frac{5}{6}\right)^{99}$

9 24-16:46

2 kary ngru is met klat
Reis!: minne partipulhastis ngru
 $P((a, b)) = \frac{1}{26}$

Σ	2	3	4	5	6	7	8	9	10	11	12
krf	1	2	3	4	5	6	5	4	3	2	1

9 24-16:55

$P(A \cup B) = P(A \setminus B) + P(B \setminus A) + P(A \cap B)$

9 24-17:13

1 skakila 6 dygus 6 adunika
 natidus adunika skakila 6 adunika.
 5 paku partipulhastis adunika 1 adunika skakila
 [adunika dygus?]

Reis! P(A^c)
 Ω = partipulhastis
 duna partipulhastis 1, ..., 6 adunika - inter with
 adunika i.
 M_i : partipulhastis, hata i-ty with p i.
 $P(A) = 6! - |M_1 \cup \dots \cup M_6|$

9 24-17:18

$$|M_1 \cup \dots \cup M_6| = \sum_{k=1}^6 (-1)^{k+1} \binom{6}{k} (6-k)!$$

$$P(A) = \frac{6! - \dots}{6!} = 1 - \sum_{k=1}^6 \frac{(-1)^{k+1} 6!}{6! k!} = \frac{53}{144}$$

$6 \rightarrow \infty$

$$1 - \sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{k!} = 1 - \frac{1}{e}$$

9 24-17:23

Reis! a) adunika $\Rightarrow \{3, 5\}$
 b) kila
 $p = 1/3 = \frac{2}{3} \cdot \frac{1}{2}$ ← skakila ngru

9 24-17:30

9 24-17:36

1.58. $n = 1200$

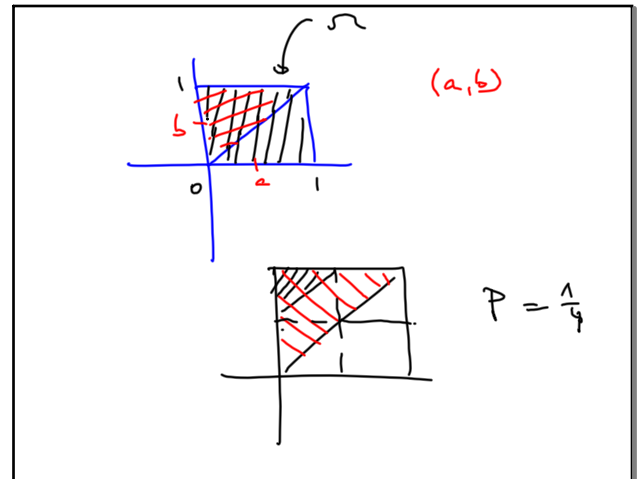
1 blue, 1 red $\left(1 - \frac{1200}{10^5}\right) = \left(1 - \frac{12}{10^3}\right)$

1 blue, 10 red $\left(1 - \frac{12}{10^3}\right)^{10}$

500 red, unknown? $\left(1 - \frac{12}{10^3}\right)^{5000}$

$P(A) = 1 - \left(1 - \frac{12}{10^3}\right)^{5000} \approx 0,56$

9 24-17:39



9 24-17:44