

4. cvič.

① $X = \# \text{es}$
 $Y = \# \text{kořal}$

$P_{X,Y}(x,y) = P(X=x, Y=y)$
 $0 \leq X, Y \leq 2 \quad X, Y \in \{0, 1, 2\}$

$X \backslash Y$	0	1	2	\dots	P_X
0	$\frac{4}{52}$				
1		$\frac{3}{51}$			
2			$\frac{2}{50}$		
					P_Y

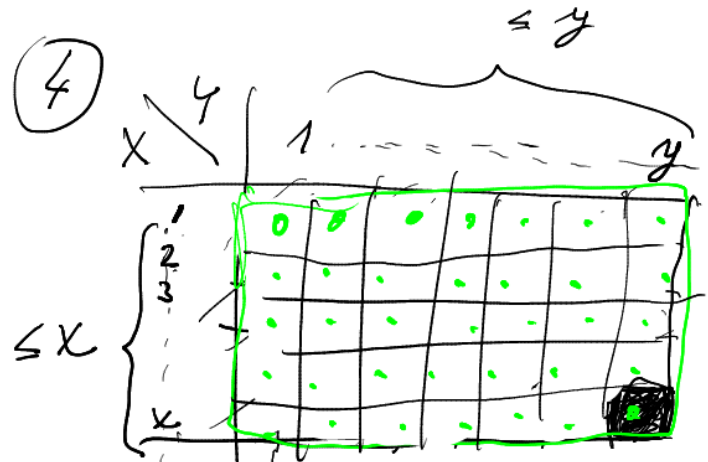
$P(X=2 \& Y=2) = 0$

$P(X=Y=0) = \frac{4}{52} \cdot \frac{4}{51}$
 $= P(\text{první karta } \neq A, K)$

$P(2. \text{ karta } \neq A, K \mid 1. \text{ karta } \neq A, K)$

$\frac{4}{52} \cdot \frac{3}{51}$

$0 \leq X+Y \leq 2 \dots \# \text{ karet}$



$P(X \leq x, Y \leq y)$
 $= P(X \leq x) \cdot P(Y \leq y)$

$P(X=x \& Y=y) = P(X=x)P(Y=y)$

pro jednoduchost. $\ln X = \ln Y = N$

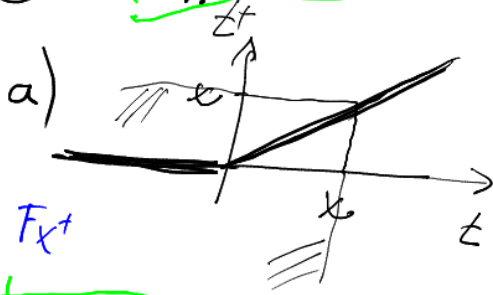
$P(X \leq x) = P(X=1) + P(X=2) + \dots + P(X=x)$

$P(Y \leq y) = P(Y=1) + P(Y=2) + \dots + P(Y=y)$

$P(X \leq x) \cdot P(Y \leq y) = \sum_{k=1}^x \sum_{l=1}^y P(X=k) \cdot P(Y=l)$
 $= P(X \leq x \& Y \leq y)$

(6) $F_x(x) = P(X \leq x)$

$P(X=x) = 0 \neq x$



$z^+ = \max(z, 0) \geq 0$

$F_{z^+}(x) = \begin{cases} 0 & x < 0 \\ x & x \geq 0 \end{cases}$

$P(X^+ \leq x) = P(X \leq x) = F_x(x)$

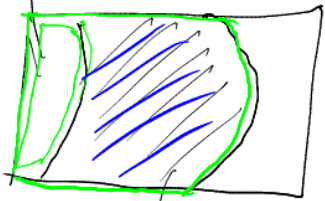
F_x, F_{x^+}



$P(|X| \leq x) = 0$

$F_{|X|}(x) = \begin{cases} 0 & x < 0 \\ P(|X| \leq 0) = P(X=0) = 0 & x = 0 \\ P(|X| \leq x) & x > 0 \end{cases}$

$\{X < -x\} \subset \Omega$



$$= P(-x \leq X \leq x) = P(X \leq x) - P(X < -x)$$

$$= P(X \leq x) - P(X \leq -x)$$

$$= F_x(x) - F_x(-x)$$

$\{X \leq x\}$

7, 10