16.11.

СЕМ упр.

Пример A, B нез. $\Rightarrow \bar{A}, \bar{B}$ са нез

$$\mathbb{P}(AB) = \mathbb{P}(A)\mathbb{P}(B) \Rightarrow \mathbb{P}(\bar{A}\bar{B}) = \mathbb{P}(\bar{A})\mathbb{P}(\bar{B})$$

$$\mathbb{P}(\bar{A} \cap \bar{B}) = \mathbb{P}(\overline{A \cup B}) = 1 - \mathbb{P}(A \cup B) = 1 - (\mathbb{P}(A) + \mathbb{P}(B) - \mathbb{P}(A \cap B)) =$$

$$\overset{\text{нез.}}{=} (1 - \mathbb{P}(A))(1 - \mathbb{P}(B)) \overset{\text{деф}}{=} \mathbb{P}(\bar{A})\mathbb{P}(\bar{B})$$

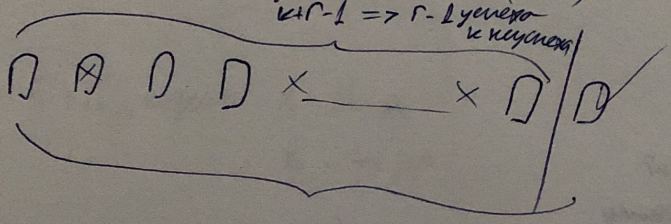
X, Y сл. величини са нез, ако $\forall (x, y) \in \mathbb{R}^2$

$$\mathbb{P}(\{X = x\} \cap \{Y = y\}) = \mathbb{P}(X = x)\,\mathbb{P}(Y = y)$$

$$\{X = x\} = \{\omega \in \Omega : X(\omega) = x\}$$

Зад $\mathbb{P}(\text{успех при 1 опит}) = p$

$\mathbb{P}(r^{\text{тия}}$ успех да е точно на $(k+r)$-я опит$) = ?$



Търсената вероятност е $\binom{k+r-1}{k} \cdot (1-p)^k p^r$

$X \sim NB(r, p)$

опити до постигането на r успеха $\quad k \in \mathbb{N} \cup \{0\}$

$$\mathbb{P}(X = r + k) = \binom{k+r-1}{k} (1-p)^k p^r$$

$Ge(p) = NB(1; 1-p)$

$NB(r, p) = \underbrace{Ge(1-p)}_{1\text{ успех}} + \underbrace{\quad}_{2\text{ успех}} + \cdots + \underbrace{Ge(1-p)}_{r\text{-ти успех}}$

$\in N$