ДЗ 3

3.1 х а е у к а я

$P(\text{фамилия получилась}) = \frac{2}{7!}$

- $A_1, \dots, A_n$ - нез. соб $P(A_i) = p_i$

  $P(\text{хот. одно}) = P(A_1 \cup \dots \cup A_n) = 1 - P(\text{ни одно}) = 1 - \prod_{i=1}^{n}(1-p_i) = 1 - \left(1 - \frac{2}{7!}\right)^n$

- $P(A_1, \dots, A_n) = P(A_1) \cdot \cdot P(A_n) = \prod_{i=1}^{n} p_i = \left(\frac{2}{7!}\right)^n$

- $\frac{2}{7!} \cdot \left(1 - \frac{2}{7!}\right)^{n-1}$ - если только на посл. раз; $\frac{2}{7!}$ если просто на посл. раз выпало

3.2 A, B - Нез. соб: $P(A \cap B) = P(A) \cdot P(B)$

$$P(A \cap A) = P(A) \cdot P(A)$$

$$P(A)^2 = P(A) \Rightarrow P(A) = \left[\begin{array}{l} 0 \\ 1 \end{array}\right.$$

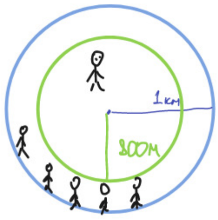
3.3 A - 0.6
B - 0.5
C - 0.4

ровно 2 попали

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

$$= (0.4 \cdot 05 \cdot 0.4) + (0.6 \cdot 0.5 \cdot 0.4) + (0.6 \cdot 0,5 \cdot 0.6) = 0,38$$

3.5 $P(A_i) = \dfrac{\pi \cdot 0{,}8^2}{\pi} = 0{,}64$



$$\binom{10}{5} \cdot 0.64^5 \cdot 0{,}36^5 + \binom{10}{6} \cdot 0.64^6 \cdot 0{,}36^4 + \binom{10}{7} \cdot 0{,}64^7 \cdot 0{,}36^3 +$$

$$\binom{10}{8} \cdot 0{,}64^8 \cdot 0{,}36^2 + \binom{10}{9} \cdot 0{,}64^9 \cdot 0{,}36 + 0.64^{10}$$

3.6 $P(A_i) = \dfrac{\frac{4}{3}\pi a^3}{\frac{4}{3}\pi R^3} = \dfrac{a^3}{R^3}$

$P(\text{во внеш.}) = 1 - \dfrac{a}{R^3}$

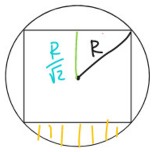
$P(n \text{ во внеш.}) = \left(1 - \dfrac{a^3}{R^3}\right)^n$

3.7 $P(A_i) = p$

$P(\text{НЧЧ}\ldots\text{Н}\underbrace{\text{ЧЧЧ}}_{l}) = P(S_{n-l} = m) \cdot P(S_l = l) =$

$\sum \text{Ч} = m + l$ $\qquad = C_{n-l}^{m}\, p^m (1-p)^{n-l-m} \cdot p^l$

3.8



$$\left(\frac{2R}{\sqrt{2}}\right)^2$$

$$\frac{\pi R^2 - \frac{4R^2}{2}}{4} = \frac{\pi R^2 - 2R^2}{4}$$

$$P_1(\text{попасть в сегм}) = \frac{\pi R^2 - 2R^2}{4\pi R^2} = \frac{\pi - 2}{4\pi}$$

$$P_2(\text{попасть в кв.}) = \frac{2}{\pi}$$

$$P(S^1_{10} = 4,\ S^2_{10} = 3,\ S^3_{10} = 1,\ S^4_{10} = 1,\ S^5_{10} = 1) = \frac{10!}{4!3!1!1!1!} P_2^4 \cdot P_1^3 \cdot P_1 \cdot P_1 \cdot P_1$$