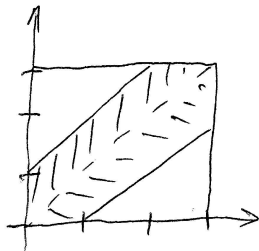


Билет № 8.16.

№1.

Геометрическое определение вероятности.

$P(A) = \frac{\mu(A)}{\mu(\Omega)}$, где $\mu(A), \mu(\Omega)$ - геометрические меры (длины, площади, объёмы)



$$\begin{aligned}\mu(\bar{A}) &= 4 \\ \mu(A) &= 9 - 4 = 5 \\ \mu(\Omega) &= 9 \\ P(A) &= \frac{5}{9}\end{aligned}$$

№2.

Равномерное распределение на отрезке.

$$f_{\xi}(x) = \begin{cases} \frac{1}{b-a}, & x \in [a, b] \\ 0, & \text{иначе} \end{cases}$$

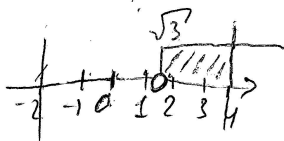
$$\begin{aligned}M\xi &= \frac{a+b}{2} \\ D\xi &= \frac{(b-a)^2}{12}\end{aligned}$$

$$F_{\xi}(x) = \begin{cases} \frac{x-a}{b-a}, & a \leq x \leq b \\ 0, & x < a \\ 1, & x > b \end{cases}$$

Задача.

$$\xi - \text{р.р. } [-2, 4] \quad \sigma = \sqrt{\frac{(b-a)^2}{12}} = \sqrt{\frac{36}{12}} = \sqrt{3}$$

$$P(\xi > 5) = P(\xi > \sqrt{3}) = \frac{\mu(\sqrt{3}; 4)}{\mu(-2, 4)} = \frac{4 - \sqrt{3}}{6}$$



	$P(H_i)$	$P(A H_i)$
H_1	$\frac{6}{18}$	$\frac{50}{40}$
H_2	$\frac{9}{18}$	$\frac{20}{40}$
H_3	$\frac{3}{18}$	$\frac{10}{40}$

$$\begin{aligned}P(A) &= \sum_{i=1}^3 P(H_i) P(A|H_i) = \frac{1}{8} \cdot \frac{5}{4} + \frac{1}{4} + \frac{1}{24} = \frac{13}{24} \\ P(H_1|A) &= \frac{P(H_1) \cdot P(A|H_1)}{P(A)} = \frac{\frac{1}{8} \cdot \frac{5}{4}}{\frac{13}{24}} = \frac{6}{13} \\ P(H_2|A) &= \frac{P(H_2) \cdot P(A|H_2)}{P(A)} = \frac{\frac{1}{4} \cdot \frac{2}{4}}{\frac{13}{24}} = \frac{6}{13} \\ P(B) &= P(H_1|A) + P(H_2|A) = \frac{12}{13}\end{aligned}$$

№4.

$$P(\xi/\eta < 2) = \frac{S_{\text{округ}}}{S_G} = \frac{9}{10}$$

