

Ödev II Çözümleri

$$1) a) P(X=8) = f(8) = \frac{8}{100} = \frac{1}{25}$$

b) 8'den az balık tutulması

$$\begin{aligned} \sum_{r=1}^7 f(r) &= P(X=1) + \dots + P(X=7) \\ &= \frac{1}{100} (1 + \dots + 7) = \frac{7 \cdot 8}{2 \cdot 100} \\ &= 7/25 \end{aligned}$$

$$c) \sum_{r=9}^{\infty} f(r) = f(9) + \dots + f(20)$$

$$\begin{aligned} &= \frac{9}{100} + \frac{10}{100} + \frac{1}{100} \sum_{r=11}^{20} (20-r) \\ &= 16/25 \end{aligned}$$

d) 6-18 arası balık tutulması

$$\sum_{r=6}^{18} f(r) = \frac{1}{100} (6+7+8+9+10)$$

$$+ \frac{1}{100} \sum_{r=11}^{18} (20-r) = \frac{19}{25}$$

2) $\int f(x) dx = 1$ olmalıdır. Böylece

Rol(X)

$$\int_0^2 \left(1 - \frac{x}{2}\right) dx = \left. x - \frac{x^2}{4} \right|_0^2 = 1 \text{ der}$$

(1)

$$b) P(0 < x < 1) = F_x(1) - F_x(0) \\ = \int_0^1 \left(1 - \frac{x}{2}\right) dx = 1 - \frac{1}{4} = \frac{3}{4}$$

$$3.) X(1) = \frac{1}{3}, \quad X(2) = \frac{1}{2}, \quad X(3) = \frac{1}{6}$$

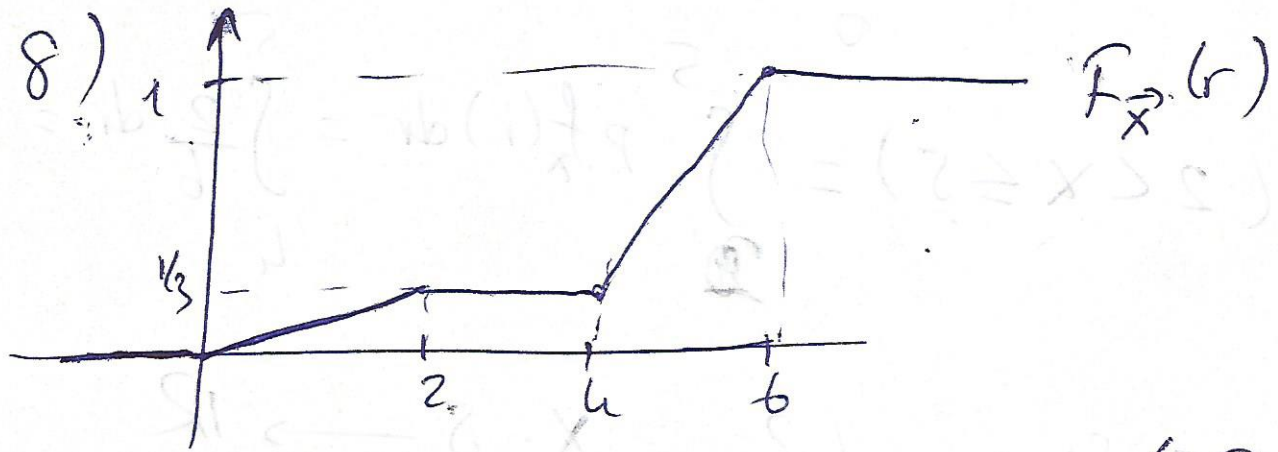
ise X kesikli RD'dir.

$$p f_x(r) = \begin{cases} \frac{1}{3} & r=1 \\ \frac{1}{2} & r=2 \\ \frac{1}{6} & r=3 \\ 0 & \text{diğer} \end{cases}$$

$$F_x(r) = \begin{cases} \frac{1}{3} & r < 1 \\ \frac{1}{3} + \frac{1}{2} & 1 \leq r < 2 \\ 1 & 2 \leq r < 3 \\ 1 & r \geq 3 \end{cases}$$

$$4) P(X > r) = 1 - P(X \leq r) \\ = 1 - F_x(r) \quad \text{dur}$$

5), 6) ve 7). seriler vektörler ile alakalıdır. Daha sonra teoremler alınacaktır.



$$F_X(r) = \begin{cases} 0, & r < 0 \\ \frac{x}{6}, & 0 \leq r < 2 \\ \frac{1}{3}, & 2 \leq r < 4 \\ \frac{2r}{6} - \frac{1}{6}, & 4 \leq r < 6 \\ 1, & r \geq 6 \end{cases}$$

$$\Rightarrow p f_X(r) = \begin{cases} 0, & r < 0 \\ \frac{1}{6}, & 0 \leq r < 2 \\ 0, & 2 \leq r < 4 \\ \frac{2}{6}, & 4 \leq r < 6 \\ 0, & \text{diğer} \end{cases}$$

olur.

$$b) P(X \leq 1) = \int_0^1 p f_X(r) dr = \int_0^1 \frac{1}{6} dr = \frac{1}{6}$$

$$P(X \leq 3) = \int_0^3 p f_X(r) dr = \int_0^3 \frac{1}{6} dr = \frac{2}{6}$$

$$P(2 < X \leq 5) = \int_2^5 p f_X(r) dr = \int_2^5 \frac{2}{6} dr = \frac{2}{6}$$

g) $i \in \{1, \dots, 6\}$ $X: S \longrightarrow \mathbb{R}$
 $i \longmapsto 10i$
 $Ran(X) = \{10, 20, 30, 40, 50, 60\}$

$$p f_X(r) = \begin{cases} 1/6 & r=10 \\ 1/6 & r=20 \\ 1/6 & r=30 \\ 1/6 & r=40 \\ 1/6 & r=50 \\ 1/6 & r=60 \\ 0 & \text{differ} \end{cases}$$

$$F_X(r) = \begin{cases} 0 & r < 10 \\ 1/6 & 10 \leq r < 20 \\ 2/6 & 20 \leq r < 30 \\ 3/6 & 30 \leq r < 40 \\ 4/6 & 40 \leq r < 50 \\ 5/6 & 50 \leq r < 60 \end{cases}$$

(4)

$$b) P(X < 35) = P(X=10) + P(X=20) + P(X=30) \\ = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{1}{2}$$

$$P(20 \leq X < 50) = P(X=20) + P(X=30) + P(X=40) \\ = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{1}{2}$$

10) X RD belli bir oolikte besonilerinin sayısını gösteren 20-Poisson dağılımı olsun. 100 oolikte 20 ise 35 oolikte $\lambda = 7$ olur

Baykace $P(X=11) = \frac{e^{-7} 7^{11}}{11!}$

$$P(X < 11) = \sum_{r=1}^{10} P(X=r)$$

$$= \frac{e^{-7} 7^1}{1!} + \dots + \frac{e^{-7} 7^{10}}{10!} \quad (*)$$

$$P(X > 11) = 1 - (*) - \frac{e^{-7} 7^{11}}{11!}$$

bulunur.