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1. öğretim C Grubu

OLASILIK VE İSTATİSTİK DERSİ

ÖDEV 2

1. soru

Zamanı dakika olarak aldım.

$X \rightarrow [90, 180]$

a) $E[x] = \dfrac{A+B}{2} = \dfrac{80+150}{2} = 135\,dk \rightarrow 2\,saat\ 15\,dk$

b) $P(150 < x) = ?$

$P(0 < x < b) = \int_{0}^{b} f(x)dx = \dfrac{1}{B-A} \int_{0}^{b} dx = \dfrac{b-0}{B-A}$

$P(150 < x < 180) = \dfrac{180-50}{180-90} = \dfrac{30}{90} = \dfrac{1}{3} \; //$

2. soru

$P(x < 5) = 0,7737$

$P(x > 3) = 0,40129$

$\Bigg\}$

$P\left(\dfrac{x-M}{\sigma} < \dfrac{5-M}{\sigma}\right) = 0,7737$

$P\left(z < \dfrac{5-M}{\sigma}\right) = 0,7737 \qquad P(z < 0,75) = 0,7737$

$\boxed{\dfrac{5-M}{\sigma} = 0,7737}$

$P\left(\dfrac{x-M}{\sigma} > \dfrac{3-M}{\sigma}\right) = P\left(z > \dfrac{3-M}{\sigma}\right) = 0,40129$

z tablosu her zaman büyük alanı verir. Bu sebeple 1'den çıkarın.

$1 - 0,40129 = \boxed{0,59871}$

z tablosunda 0,25

$\boxed{\dfrac{3-M}{\sigma} = 0,25}$ $\qquad \boxed{\begin{matrix} M = 2 \\ \sigma = 4 \end{matrix}}$

a) $E[x] = M$ ve $Var[x] = \sigma^2$

$\underline{E[x] = 2} \qquad \underline{Var[x] = 16}$

b) $P(-2 < x < 6) = ?$ $\qquad P\left(\dfrac{-2-2}{4} < \dfrac{x-M}{\sigma} < \dfrac{6-2}{4}\right) = P(-1 < z < 1)$
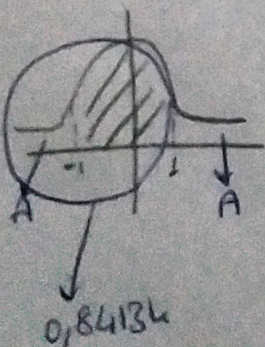
0,84134

$1 - 0,84134 = 0,15866 = A$

$1 - 2A \rightarrow$ taralı olan

$P(-1 < z < 1) = 1 - 2A = 1 - 0,31732$

$= \underline{0,68268}$

3.soru $\qquad$ $E[x] = 5\pi \text{ cm} \rightarrow$ ortalama teller

Cember cevrelerine bölelim.

$5\pi / 2\pi r = 2,5 \rightarrow$ Oluşan telden ortalama

Gember sayısı

$E[N] = 2,5 = \lambda$

$P(N=n) = e^{-\lambda} \dfrac{\lambda^n}{\lambda!} = e^{-2,5} \cdot \dfrac{(2,5)^n}{n!}$