DA-IICT

CT314

TUTORIAL 3

Function of Random variable

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1. For the transformation $Y = X^2$. Find the PDF for Y given the PDF of X in each case:
   1. $f_X(x) = \frac{1}{6}\sum_{i=1}^{6}\delta(x-i)$
   2. $f_X(x) = \frac{1}{6}\sum_{i=-2}^{3}\delta(x-i)$
2. If $Y = 2X + 3$ and PDF of random variable X is

$$f_X(x) = \begin{cases} 3x^2, & 0 < x < 1 \\ 0, & otherwise. \end{cases}$$

   then find PDF of Y.
3. If $Y = X^2$ and PDF of random variable X is $f_X(x)$ then find PDF of Y . Take X as Gaussian random variable $Z \sim N(0,1)$ $(\mu = 0, \sigma = 1)$ then find $f_Y(y)$.
4. If $Y = \ln X$ and PDF of random variable X is

$$f_X(x) = \frac{\theta}{x^{\theta+1}}, x > 1, \theta > 0,$$

   then find PDF of Y.
5. If $Y = \frac{X-a}{b-a}$ and PDF of random variable X is

$$f_X(x) = \begin{cases} \frac{1}{b-a}, & a < x < b \\ 0, & otherwise, \end{cases}$$

   then find PDF of Y.