

	Function of Random variable:
and the description of the contract of the con	Let X be a Continuous random variable with Pdf
d CANNON in the Control of the Contr	f(z). If the transformation y=v(z) is
	Continuously differentiable and
	Eithen non-Incueasing on non-decreasing
	For all values within the leange of X for which floto
phistrag on regentioned relations with exclusive and order.	then the pdf of y=v(x) is
aggeri (dasam-come) "dasam n, can his misa-atra disampini da anni ana	g(y) = f(x(y)) dx
0	
<u>Ex</u>	If $X \sim U(0,1)$ then find the dist fun of $y=e^{x}$
Soln	Pat of x is
Soln	$f(x) = \begin{cases} 1 & \text{if } 0 < x < 1 \\ 0 & \text{if } 0 \end{cases}$
	$y=e^{\chi} \Rightarrow \chi = lofy$
	$\frac{\Rightarrow dx = 1}{dy} = \frac{1}{y}$
	as 0 <x<1 ==""> 0<lofy<1< th=""></lofy<1<></x<1>
	=) 1 < y < e
	So $g(y) = 1 \cdot y = 1$ as $y > 0$
Andrew or the constitution of the constitution of the	
	· 21 C of
	$9/\omega$ - $9/\omega$. $1/4/2$
in children materia childre, quandiplica per mercilore, materi	i. paf of y is gly) = \$ ly; 1 <y<e 0; 0/w.</y<e
Ex.	If the Pot of a Random variable X is given by
	If the Pot of a Random variable X is given by $f(x) = \int 2\pi; 0 < x < 1$ $\int_{0}^{\infty} o(w) dw$
	60;0/w
	Find the pdf of Y=8x3.



 S_{α}^{n} , $f(x) = \int \partial x; o < x < 1$ $C_{\alpha}^{n}; o | w.$

:. g(y)= f(x(y)) · |dx|

 $= 2.(9)^{1/3} \cdot 1.9^{-2/3}$ $= 1.(9)^{1/3} ;$

O(x(1)) O(y(8

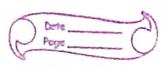
: Paf of y= \(\frac{1}{6}(y)^{\frac{1}{3}}; 0 < y < 8 \)

Que If X ~ N(0,02). Find the Paf of ex.

Si? $X \sim N(0, \sigma^2)$, the Pdf of X is $f(x) = \frac{1}{\sqrt{2\pi}} \cdot \frac{e^{-x^2/2\sigma^2}}{\sqrt{2\pi}} \cdot -\infty < x < \infty$

 $y = e^{x} \Rightarrow x = logy$ $\Rightarrow dx = 1$ dy y

 $\frac{1}{100} - \infty < x < \infty = 0 - \infty < \log y < \infty$ $\frac{1}{100} = \frac{1}{100} = \frac{1}{100}$



Que If $X \sim U(0,1)$ then find the Pdf of y = Sinx Soll Pdf of X is <math>f(x) = S1; O < x < I Co; O/w.

 $y = \sin x$ $\Rightarrow x = \sin^2 y$ $\Rightarrow dx = 1$ $dy = \sqrt{1-y^2}$

As 0 < x < 1 => 0 < Sin y < 1 => 0 < y < Sin 1.

:](y) = f(x(y)) |dx

So g(y)= \$ /\(\int_{-\text{y}^2}\); 0<y<Sin1 0; 0/w.

The If x is of

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If x is Continuous standom variable with Pdf $f(x) = \int_{0}^{\infty} |x|^{2} |x|^{2} |x|^{2} |x|^{2}$ $f(x) = \int_{0}^{\infty} |x|^{2} |x|^{2} |x|^{2}$ $f(x) = \int_{0}^{\infty} |x|^{2} |x|^{2}$

Find the Pdf of X=2x-3.

Anst gly)= \(\frac{9+3}{48}; -1<9<7 \)

Que If $X \sim U(-1,1)$. Find the density function of $Y = Sin\left(\frac{\tau_1}{2}\right)$



Any	$J(y) = \begin{cases} \frac{1}{2\pi} & \frac{1}{\sqrt{1-y^2}}; -1 < y < 1 \\ 0; & 0 W. \end{cases}$
Que	For a grandom variable X with Pdf $f(x) = \int_{0}^{e^{-X}} x > 0$ $\int_{0}^{e^{-X}} 0 w$ Find the density function of $Y = X \cdot \sqrt{X}$. Ant $g(y) = \int_{0}^{2} \frac{1}{3} e^{-(y^{2}/3)} y > 0$
	= 13 9 3 e , 3 > 0 0 ; 0/w
Soin Soin	If $X \sim Exp(\lambda)$. Find the distrof $Y = \bar{e}^{\lambda x}$. $X \sim Exp(\lambda)$. The Paf of x is $f(x) = \int_{0}^{x} \lambda \bar{e}^{\lambda x}; x > 0$ $0; 0 w.$ $y = \bar{e}^{\lambda x} \implies x = -1 \log y$
	$= \frac{dx}{dy} = -1$
	for 270; -1logy >0
))	$= \lambda e^{\log y} \cdot \left[\frac{-1}{\log y} \right] ; 0 < y < 1$
	= 1 dy. 1; 0< y < 1
))	=> 9 (y)= S 1 ; 0 < y < 1 ~ (0,1)

If the transformation $y = g(x)$ is defined for all values (within the stange of X. Then the Pdf of $Y = g(x)$ is obtained in following two Gas. Get $Y = g(x)$ is one-one. Get $Y = g(x)$ is one-one. Est (v) let X be a grandom variable with $f(x) = \int_{0}^{x} y_{3}$; $x = 1, 2, 3$ Lo; o w. Find the Buobs dist of $Y = 2x = 1$ Sol $X = 1 = 2 = 3$ P(x) $Y_3 = Y_3 = 1 = 3$ P(x) $Y_3 = Y_3 = 1 = 3$ So $g(y) = \int_{0}^{x} y_{3} = 1 = 3$ P(x) $y_3 = y_3 = 1 = 3$ So $g(y) = \int_{0}^{x} y_{3} = 1 = 3$ P(x) $y_3 = y_3 = 1 = 3$ Simultaneously. Find the people dist of $Y = (1 + x)^3$. 3ol $Y = 0, 1, 2 = 0.0000$ freads X 0 1 2 P(x) $Y_4 = 1/4$ P(x) $Y_4 $	>	Let X be a discrete Random variable with P.m.f. Pla.
Within the Mange of X. Then the Pdf of Y=g(x) is obtained in following two Gay. GALT Y=g(x) is one-one. GALT Y=g(x) is not one-one. EX (1) let X be a mandom variable with f(x)= \$\frac{1}{3}; \pi=1,2,3\$ \[\begin{array}{c} \text{Find the Buob dist} of Y=2x=1 \\ \text{X} & 1 & 2 & 3 \\ \text{P(x) } \text{Y} & \text{Y} & \text{Y} & \text{Y} \\ \text{So}^n & \text{Y} & \text{Y} & \text{Y} & \text{Y} \\ \text{Y} & \text{Y} & \text{Y} & \text{Y} & \text{Y} \\ \text{Y} & \text{Y} & \text{Y} & \text{Y} & \text{Y} \\ \text{Y} & \text{Y} & \text{Y} & \text{Y} & \text{Y} \\ \text{Y} & \text{Y} & \text{Y} & \text{Y} & \text{Y} \\ \tex		If the transformation 4= 9(x) is defined for all values
Then the Pdf of $Y=g(x)$ is obtained in following two Gaus. Gal $Y=g(x)$ is one-one. Gal $Y=g(x)$ is one-one. Gal $Y=g(x)$ is one-one. Ex (1) Let X be a standom variable with $f(x)=\int_{0}^{x} y_{3}$; $x=1,2,3$. Lo; o w. Find the Brob dist of $Y=2x=1$ $X=1=2=3$ $P(x)$ y_{3} y_{3} y_{3} y_{3} $Y=g(x)=1$ is 1-1 function. Yell $Y=1$ $Y=$		Within the seance of X.
two Gay. Gara Y=g(x) is one-one. Gara Y=g(x) is not one-one. Gara Y=g(x) is not one-one. Ex (1) Let X be a standom variable with $f(x) = \int_{0}^{1} Y_{3}$; $x=1,2,3$. Co; o w. Find the Buob dist of Y=2x=1 X 1 2 3 P(x) $\frac{1}{3}$		Then the Pdf of Y=9(x) is obtained in following
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Gitt $Y = g(x)$ is not one-one. Ex (1) Let X be a standom vasiable with $f(x) = \int_{0}^{x} x_{-1} ^{2} x$		•
Ex (1) Let X be a standom Vasiable with		
Find the Buob dist of $Y=2x=1$ Sol X 1 2 3 P(x) $\frac{1}{3}$ $\frac{1}$		
Find the Buob dist of $Y=2x=1$ Sol X 1 2 3 P(x) $\frac{1}{3}$ $\frac{1}$	E.X	(1) Let X be a sundam variable with
Find the Buob dist of $Y = 2x - 1$ Sol $X = 1 = 2 = 3$ $P(x) \frac{1}{3} \frac{1}{3$	=	
Find the Book dist" of $Y = 2x - 1$ Sol $X = 1 \times 2 \times 3$ $Y = 2 \times - 1 \times 1 - 1 \times 1 - 1 \times 1 - 1 \times 1 \times 1 \times$	•	
Sol X 2 3 Y_3 Y_3 Y_3 Y_4		
$[V(x) \frac{1}{3} \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[V(x) \frac{1}{3} \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[V(x) \frac{1}{3} \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[V(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[V(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[V(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ is } 1-1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} \frac{1}{3}] = 2 \times -1 \text{ function}.$ $[O(x) \frac{1}{3} $	Sol	
Y 1 3 5 P(Y) $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ So $\frac{1}{3}$ $\frac{1}{3$		P(x) 1/3 1/3 \ Y = 2 x -1 is 1-1 function.
P(Y) $\frac{1}{3}$		
So $g(y) = S/3$; $y=1,3,5$ (2) let X be the no. of heads when two Coins are topical. Simultaneously. Find the puob. distr of $Y=(1+x)^3$. S=EHH, HT, TH, TT g $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads		
(2) let X be the no. of heads when two Coins are topical Simultaneously. Find the parobodist of $Y=(1+x)^3$. 3017 $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads		P(y) 1/3 1/3 /3
(2) let X be the no. of heads when two Coins are topical Simultaneously. Find the parobodist of $Y=(1+x)^3$. 3017 $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads $X=0,1,2-no.of$ heads		So g(y)= 5 /3; y=1,3,5
Simultaneously. Find the perobodist of $Y=(1+x)^3$. S=\(\frac{2}{2}\) HH, HT, TH, TT\(\frac{3}{2}\) $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$		6, 0/w.
Simultaneously. Find the perobodist of $Y=(1+x)^3$. S=\(\frac{2}{2}\) HH, HT, TH, TT\(\frac{3}{2}\) $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$ $X=0,1,2-no.of\ heads$		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(3)	
X = 0,1,2 - no.of heads $X = 0,1,2 - no.of heads$ $X = 0,1,2 - no.of heads$ $Y = 0,1,2 - no.of heads$		Simultaneously. Find the parobadist of Y=(1+x)3
X = 0,1,2 - no.of heads $X = 0,1,2 - no.of heads$ $X = 0,1,2 - no.of heads$ $Y = 0,1,2 - no.of heads$	- Y	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	<u>Sol'</u>	
		and the second s
		X 0 12 3 Y 1 8 27
(: Y = (1+x) is 1-1.)		[P(x) /4 2/4 /4] [P(4) /4 2/4 /4]
		(: Y = (1+x) ix 1-1)

HM (3)	Let X ~ B(3, 2). Find the Brob. distr of Y= x?
	chat-
(4)	Let X be a geometric grandom variable with the
	Perob. dist' $f(x) = \left(\frac{3}{4}\right)\left(\frac{1}{4}\right)^{\chi-1}; \chi=1,2,3$
	Find the perob. dist of $Y=X^2$ $Y=X^2$ is 1-1 function (* $X=1,2,3$)
<u>Sol</u>	
	So $x = \sqrt{y}$
	$g(y) = \left(\frac{3}{4}\right)\left(\frac{1}{4}\right)^{\sqrt{g}-1}; y = 1, 4, 9,$
Calest	when $Y = f(x)$ is not one-one.
	•
Que	Let X be the no. of heads in two tones of a fair
Soln:	Gin. Find the prob. dist of $Y = (x-1)^2$ X = 0, 1, 2
= 301	P(x)= /4 2/4 /4
	y= 1 If x=0
	$Y = 0$ If $x = 1$ $\Rightarrow Y = (x - 1)^2$ is not 1-1 function
	Y=1 if X=2
The second secon	So Y O 1 > Y O 1
	P(Y) 2/4 1/4+1/4 P(Y) 1/2 1/2
8.0	