Problem 1: The PDF of exp(X)

(6/6 points)

Let X be a random variable with PDF f_X. Find the PDF of the random variable $Y = e^X$ for each of the following cases:

1. For general f_X, when $y > 0$, $f_Y(y) =$

- $f_X\left(\frac{e^y}{y}\right)$
- $f_X\left(\frac{\ln y}{y}\right)$
- $\frac{f_X(\ln y)}{y}$ ✔
- none of the above

2. When $f_X(x) = \begin{cases} 1/3, & \text{if } -2 < x \leq 1, \\ 0, & \text{otherwise,} \end{cases}$

we have $f_Y(y) = \begin{cases} g(y), & \text{if } a < y \leq b, \\ 0, & \text{otherwise.} \end{cases}$

Give a formula for $g(y)$ and the values of a and b using standard notation . (In your answers, you may use the symbol 'e' to denote the base of the natural logarithm.)

$g(y) =$ 1/(3*y) ✔

$a =$ e^(-2) ✔

$b =$ e ✔

3. When $f_X(x) = \begin{cases} 2e^{-2x}, & \text{if } x > 0, \\ 0, & \text{otherwise,} \end{cases}$

we have $f_Y(y) = \begin{cases} g(y), & \text{if } a < y, \\ 0, & \text{otherwise.} \end{cases}$

Give a formula for $g(y)$ and the value of a using the standard notation .

$g(y) =$ 2/y^3 ✔

$a =$ 1 ✔

4. When X is a standard normal random variable, we have, for $y > 0$, $f_Y(y) =$

- $\frac{1}{\sqrt{2\pi}} e^{-\frac{(\ln y)^2}{2}}$
- $\frac{1}{\sqrt{2\pi}} \frac{e^{-\frac{(\ln y)^2}{2}}}{y}$ ✔
- $\frac{1}{\sqrt{2\pi}} e^{-\frac{(\ln y)^2}{2y}}$
- $\frac{1}{\sqrt{2\pi}} \frac{e^{-\frac{\ln y}{2}}}{y}$
- none of the above

You have used 2 of 2 submissions

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DISCUSSION

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