

Stat 134: Change of Variable Review

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Problem 1

Let X be a random variable. Let $Y = F(X)$ where F is the CDF of X . Find the density of Y .

Problem 2

Show that if Y has the uniform $(0, 1)$ distribution, then $Y = \tan(\pi U - \frac{\pi}{2})$ has the Cauchy distribution i.e. $f_Y(y) = \frac{1}{\pi(1+y^2)}$.

Problem 3

Suppose X has the uniform $[-1, 2]$ density. Find the density of $Y = X^2$.