# *Stat 134: Section 16*

*Ani Adhikari*

*March 15, 2017*

## *Problem 1*

Suppose $X$ has an exponential $(\lambda)$ distribution, What is the distribution of $cX$ for a constant $c > 0$?
*Ex 4.4.1 in Pitman's Probability*

## *Problem 2*

Suppose $U$ has a uniform $(0, 1)$ distribution. Find the density of $U^2$.
*Ex 4.4.3 in Pitman's Probability*

## *Problem 3*

Suppose $X$ has uniform $[-1, 2]$ distribution. Find the density of $X^2$.
*Ex 4.4.5 in Pitman's Probability*

Is this a one-to-one transformation?

## *Problem 4*

Show that if $U$ has uniform $(0,1)$ distribution, then $\tan(\pi U - \pi/2)$ has the Cauchy distribution.
*Ex 4.4.7 in Pitman's Probability*

Recall that if $Y \sim$ Cauchy, the density of $Y$ is $f_Y(y) = \frac{1}{\pi(1+y^2)}$ for $y \in (-\infty, \infty)$.

## *Problem 5*

Let $Z$ be a standard normal random variable. Find formulae for the densities of each of the following random variables: (a) $|Z|$; (b) $Z^2$; (c) $1/Z$; (d) $1/Z^2$.
*Ex 4.4.10 in Pitman's Probability*