Stat 134: Section 12

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Problem 1

Suppose X has an exponential (λ) 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 uniform $(0,1)$ distribution. Find the density of U^2.
Ex 4.4.2 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

Problem 4

Show that if U has uniform $(0, 1)$ distribution, then $tan(\pi U - \pi/2)$ has the standard Cauchy distribution. (The standard Cauchy distribution is defined over (∞, ∞), with density $f(x) = \frac{1}{\pi(1+x^2)}$).
Ex 4.4.7 in Pitman's Probability