

University of California, Los Angeles
Department of Statistics

Statistics 100B

Instructor: Nicolas Christou

Homework 1

EXERCISE 1

A pdf or pmf is called an exponential family if it can be expressed as

$$f(x|\boldsymbol{\theta}) = h(x)c(\boldsymbol{\theta})\exp\left(\sum_{i=1}^k w_i(\boldsymbol{\theta})t_i(x)\right).$$

Express $X \sim \Gamma(\alpha, \beta)$ in this form.

EXERCISE 2

A random variable X has a folded normal distribution if its pdf is given by

$$f(x) = \frac{2}{\sqrt{2\pi}}e^{-\frac{x^2}{2}}, \quad 0 < x < \infty.$$

Find the transformation $Y = g(X)$ so that $Y \sim \Gamma(\alpha, \beta)$. What are the values of α and β ?

Find the mean and variance of X . Use **R** to draw the pdf of X .