

94. Let  $Z \sim N(0, 1)$  and  $X \sim \chi_v^2$ ,  $Z$  and  $X$  independent.

(a) Find the joint probability density function (PDF) of  $(Z, X)$ .

(b) Define

$$T = \frac{Z}{\sqrt{X/v}}$$

Use a bivariate transformation to find the PDF of  $T$ .