

Due on Thursday, February 5, 2008

Make sure you show all your work on all problems; no credit will be given for just the answer.

1. Read Sections 8.1–8.4 of the text.
2. Do problems 5, 9, 12, 14 on pp. 283–287. Hint for 14: Write $T = Z/\sqrt{Y/\nu}$.
3. Suppose $X_1 \sim N(1, 1)$, $X_2 \sim N(2, 5)$, $X_3 \sim N(0, 1)$, $Y \sim \chi^2(3)$, and all random variables are independent.

(a) What is the distribution of

$$U = 2X_1 - X_2?$$

(b) Find a constant k such that

$$W = k \frac{U}{\sqrt{X_3^2 + Y}}$$

has a t distribution. What are the degrees of freedom for the distribution?

Suggested additional problems (DO NOT HAND IN): problems 3, 4, 6, 8, 15 (problem 15 is an especially important one for you to do), 18 on pp. 283–287.