

Homework 8 - Due Friday, Nov. 2

Do Problems 9.99, 9.100 and the problem below, and 10.2, 10.5 and 10.6.

Homework should be written neatly and clearly explained. If it requires more than one sheet, the sheets must be stapled. Include your name and id number in the top right corner of your homework.

**Problem 1.** Let  $X$  have a gamma distribution with  $\alpha = 3$  and  $\beta > 0$ .

(a) Compute the Fisher Information  $I(\beta)$ .

(b) If  $X_1, \dots, X_n$  are an iid random sample with the same distribution as  $X$ , then the MLE,  $\hat{\beta}$ , for  $\beta$  is  $\frac{1}{3}\bar{X}$ . What is the asymptotic distribution of  $\sqrt{n}(\hat{\beta} - \beta)$ ?