Math 50 Stat Inf: Homework 5

due Wed Feb 8

4.6 : 1,

4,

6 (this requires a little messing around, but good way to get to know $\Gamma(r)$ function).

5.2 : 1,

2 (the 'estimate' is a binary choice here),

6,

9a (compare Worksheet of 2/1/06),

15,

23 (algebra is easier if you give symbols to sample moments, for example $m_k := (1/n) \sum_i = 1^n y_i^k$).

A. The three data $y_1 = 3.4$, $y_2 = 2.5$, $y_3 = 5.7$ are collected; it is believed they are independent samples from a normal pdf with unknown μ and σ. Plot likelihood $L(\mu, \sigma)$ as a function of the two parameters μ and σ: produce both a surface (3D) plot and a contour (2D) plot. Make sure you choose a domain which shows the likelihood peak, label axes, see how beautiful you can make it!

Hints for matlab: if `m` is a list of μ values, and `s` a list of σ values, then `[mm, ss] = meshgrid(m, s);` makes rectangular arrays of values at which to calculate your function. For instance if $L(\mu, \sigma) = \mu^2 + \sigma$ were true (of course it's not), you'd then calculate `L = mm.^2 + ss;`, and plot with `surf(mm, ss, L);`. Look up the `contour` command.

5.3 : 1 (sorry, you'll have to type in the data to compute the sample mean here; I'll have electronic data in future),

3,

8,

25.

5.4 : 1,

10,

17,

20.