Homework Notes: 8.1-8.2

8.5 Be sure to look 8.4 over first (we did it in class).

In 8.5, change the setup to:

$$X_1, \ldots, X_{n_1}, Y_1, Y_2, \ldots, Y_{n_2}$$

are the Bernoulli trials, n_1 of them using parameter θ_1 and n_2 of them using parameter θ_2.

8.7
- You might look at the distribution first to get a feeling for what it is.

- Show that the mean of each X_i is zero.

- Show that the variance of each X_i can be written as:

$$1 - \left(\frac{1}{2}\right)^{i-1} + \left(\frac{1}{4}\right)^{i}$$

- Show that the variance of Y_n can be written as

$$n - 2 + \frac{1}{3} + A_n$$

where $A_n \to 0$ as $n \to \infty$.

8.9
- Show that $E(|X_i - \mu_i|^3) = \left(1 - \left(\frac{1}{2}\right)\right)^3$

- Find A so that:

$$[\text{var}(Y_n)]^{-3/2} \sum_{i=1}^{n} c_i = \frac{\sum_{i=1}^{n} A^3}{\left(\sum_{i=1}^{n} A^2\right)^{3/2}}$$

You may assume that this fraction has the form:

$$\frac{n + \text{Terms go to zero as } n \to \infty}{n^{3/2} + \text{Terms go to zero as } n \to \infty}$$

(And therefore, the CLT holds).