PMAT 501/601 L01 Winter 2009
Assignment 3

Questions taken from the text by D. Cohn will be specified by page and number. Due March 18 , 2009.

1. 1. Show that the completion $(X, \mathcal{A}_\mu, \overline{\mu})$ of an already complete measure space $(X, \mathcal{A}, \mu)$ is the measure space itself, i.e. $\mathcal{A}_\mu = \mathcal{A}$ and $\overline{\mu} = \mu$.

2. 2. p.7 - 9(b). Note that a very short solution to this question can be obtained using material found a little later in Chapter 1, you are welcome to do this. For a (10 pt) bonus, also do 9(a) and use the result to give a more explicit example, indeed a Borel set, that is neither an F_σ nor a G_δ. [Hint for 9(a) : If $\mathbb{Q}$ were a G_δ then its complement, the irrationals, would be an F_σ, say a countable union of closed sets C_n. Show each C_n must be nowhere dense, then apply the Baire category theorem (to total space $\mathbb{R}$).]

3. 3. 57-8

4. 4. 60-1

5. 5. 60-2

6. 6. 61-6