Suggestions - PS 3

2. I.23: (a) Is the intersection of all σ-fields which contain $\mathcal{S}$ a σ-field? Notice (b) is similar to 14(a).

3. I.27: Note

$$T_n x - T_m x = T_n x - T_n y + T_n y - T_m y + T_m y - T_m x,$$

with $y \in D$. Choose y so $\| y - x \| \leq \epsilon/(3C)$ (what is C?). For n, m large show the left side norm is less than ϵ, so $\{T_n x\}$ is Cauchy and so convergent. Thus there is a T which is the limit of T_n for all x. Show T is linear. Note since $Tx = \lim_{n \to \infty} T_n x$, T must be bounded (why?).

4. Operator norm: Lagrange multipliers