442C Banach algebras 2009–10
Errata

December 3, 2009

This is a list of the errors in the printed notes and exercises that I handed out. Hopefully they're now corrected in the online versions.

Notes

Example 1.5.11 (i) This should read:

> (i). If A is a non-unital Banach algebra then the map $\theta\colon A \to \widetilde{A}$, $a \mapsto (a, 0)$ from Definition 1.3.20 is an isometric homomorphism. Hence $\theta(A)$ is a Banach subalgebra of $\widetilde{A}$ which is isometrically isomorphic to A.

Page 17 The end of the second paragraph should read:

> If X is compact, then any closed subset of X is also compact.

Remark 2.4.2(iii) The Hahn-Banach theorem is not needed here; this follows directly from Remark 2.4.2(ii). So this should read:

> By (ii), it is easy to see that X^* with the weak* topology is a Hausdorff topological space.

Proof of Corollary 4.1.10 At the end of first paragraph, add:

> The commutant of a self-adjoint subset of A is self-adjoint (that is, it is closed under the involution), so C is self-adjoint. Hence C is a unital abelian C*-subalgebra of A.

Lemma 4.2.1 Insert "with real coefficients" into the statement:

> If $m \in \mathbb{N}$ then there is a sequence of polynomials $p_1, p_2, p_3, \ldots$ with real coefficients such that...

and the final line of the proof should be

$$\sup_{t\in[2/m,1]} |1-p_n(t)| = \sup_{t\in[2/m,1]} (1-t^n)^{m^n} \leq \sup_{t\in[2/m,1]} \frac{1}{(mt)^n} \leq 2^{-n} \to 0 \text{ as } n \to \infty.$$

Proof of Theorem 4.2.2, part (iii) The third sentence should be

> Since L is compact, $g_x(L)$ is compact, so is contained in a set of the form $[s,t]$ for some $s > 0$.

Lemma 4.3.4, part (i) In the first line, delete the word "closed", and change $a_1^{n_1}a_2^{n_2}\dots a_n^{n_k}$ to $a_1^{n_1}a_2^{n_2}\dots a_k^{n_k}$.

Lemma 4.3.7 Insert the word "normal":

> Suppose that a is a normal element of a unital C*-algebra,

Proof of Lemma 4.5.8 Replace $\tau_0(a)$ with $|\tau_0(a)|$, twice, and replace $\tau(a)$ with $|\tau(a)|$ in the final line.

Exercises

Exercise sheet 2, question 7 The lettered parts should be:

(a). Show that K is a closed ideal of $C(\overline{\mathbb{D}})$.

(b). Show that the map

$$\theta\colon C(\overline{\mathbb{D}})/K \to C(\mathbb{T}), \quad f + K \mapsto f|_{\mathbb{T}}$$

is a well-defined isometric isomorphism from the quotient Banach algebra $C(\overline{\mathbb{D}})/K$ onto the Banach algebra $C(\mathbb{T})$.