1. Read pages 305–306 of Hislop-Sigal on the set of all bounded operators from $X$ to $Y$, which is denoted $\mathcal{L}(X,Y)$ (also called $\mathcal{B}(X,Y)$). Do problem A3.7, which finishes the proof of Theorem A3.16. When we have $X = Y$ and use the adjoint, show that $\mathcal{L}(X)$ is a Banach algebra.

2. Consider the Banach space $(C([0,1]), \| \cdot \|_\infty)$. Let $a \in C([0,1])$ and define the multiplication operator $A : f \in C([0,1]) \mapsto a f$. Show that $A$ is a bounded linear operator and compute its norm. If $|a| < 1$, show that the operator $1 + A$ is a boundedly invertible operator.
