MATH5010 Linear Analysis (2020-21): Homework 8. Deadline: 19 Apr 2021

Important Notice:

♣ The answer paper must be submitted before the deadline.
♠ The answer paper MUST BE sent to the CU Blackboard. Please refer to the course web for details.

1. Let X be a Hilbert space. Show that for every $\varepsilon > 0$, there is $\delta > 0$ such that $\|x-y\| < \varepsilon$ whenever x and y in X with $\|x\| = \|y\| = 1$ and $\|\frac{x+y}{2}\| > 1 - \delta$.

2. Let M be a vector subspace of a Hilbert space X. Show that M is closed if and only if $(M^{\perp})^{\perp} = M$.

$***$ **End** $***$