

Homework 3 , due Thursday October 23

I: Do problem 8 in Section 4.7 in Kreyszig.

II: Do problem 11 in Section 4. 7 in Kreyszig.

III: If the inverse T^{-1} of a closed linear operator exists, show that that T^{-1} is a closed linear operator.

IV: If $T : X \rightarrow Y$ is a closed linear operator, where X, Y are normed spaces and Y is compact, show that T is bounded.

V: Let $T : D(T) \rightarrow Y$ is a linear operator with graph $G(T)$, where $D(T) \subset X$ and X and Y are Banach spaces. Show that T has an extensions \tilde{T} which is a closed linear operator with graph $\overline{G(T)}$ if and only $\overline{G(T)}$ does not contain an element of the form $(0, y)$, where $y \neq 0$.