

**An operator of index zero which isn't invertible.**

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Let  $P$  be a non-trivial finite-rank idempotent in  $B(X)$  ( $X$  is a Banach space), then  $I - P$ , the difference of an invertible operator and a compact operator, is Fredholm, of index  $\text{ind}(I - P) = 0$ , and non-invertible.