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MA 546
Spring 2025

Homework 10

Due April 2nd on paper at the beginning of class. Please let me know if you have a question or find a mistake.

1. Exercises 1 and 2 from https://www.math.purdue.edu/~kdatchev/546/sturmliouville.pdf.
3. Let $\mathcal{H}$ be a Hilbert space, A a compact self-adjoint operator on $\mathcal{H}$, B a bounded self-adjoint operator that commutes with A. Let $\mathcal{H}'$ be the orthogonal complement of the kernel of A. Prove that $\mathcal{H}'$ has an orthonormal basis that is at most countable and that consists of eigenvectors of both A and B.