Math 121A − Homework 10

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Reading: Sections 4.3 and 5.1

Note: This is the last official homework assignment. Next week I will post a non-homework (which won't be collected) that covers problems from section 5.2

- **Section 4.3:** 1, 2, 15, 20, 22(c), 24
- **Section 5.1:** 1, 3(a), 4(e), 8(a)(b), 11, 12, 14, 15(a), (Optional: AP)

Optional Additional Problem (Requires Math 3D) Let $V = C^\infty(\mathbb{R})$ and define $T : V \to V$ by $T(y) = y''$. Find all the eigenvectors of T.

Hint: There are 3 cases here: $\lambda > 0$, $\lambda = 0$, and $\lambda < 0$.

Some Extra Hints:

4.3.20: Do it by induction on the size of I

4.3.22(c): M is the matrix in (a). You need to do it by induction on n, using row and column expansions. If you need more hints, check out: Vandermonde Determinant

4.3.24: Do it by induction on n, by expanding along the first row. I believe the answer is $a_0 + a_1 t + \cdots + a_{n-1}t^{n-1} + t^n$