example: Let V be a finite-dim. vector space over $\mathbb{C}$.

Then $T: V \to V$ is diagonalizable if and only if all the Jordan blocks in the Jordan canonical form for T are 1×1 matrices.

The Jordan canonical form theorem, which is contained in Chapter 7 of the textbook, gives a complete answer to one of our major questions from the beginning of the course: "given $T: V \to V$ a linear map, if I am allowed to choose a basis β for V then how simple can I make the matrix $[T]_\beta$ look?"

It will also allow us to fill in the missing part of our work on linear differential equations: if the auxiliary polynomial