HOMEWORK #1 (DUE WEDNESDAY, FEB. 25).

02/17/2015

Note: *Turn in only the "starred" problems; out of these, selected problems will be graded.*

0*. Let k be a field and let V be a vector space over k. Show that V is finite dimensional if and only if every $\phi \in \mathrm{End}_k(V)$ satisfies a polynomial equation with coefficients in k, i.e., there are $\alpha_0, \ldots, \alpha_{m-1} \in k$ such that

$$\phi^m + \alpha_{m-1}\phi^{m-1} + \cdots + \alpha_1\phi + \alpha_0 \,\mathrm{id}_V = 0.$$

Section 10.5: Exercises 1, 2*, 3*, 8*, 12*, 13, 27, 28.
Section 11.1: Exercises 5, 6, 13*, 14.
Section 11.2: Exercises 9, 10, 11*.
Section 11.3: Exercises 4*, 5.
Section 11.4: Exercises 3*, 6.