$p(t)$ has a repeated root $t = c$ (of multiplicity k, say) then the corresponding part of a basis to the solution space of the differential equation

$$p(D)(y) = 0$$

is $\{ e^{ct}, te^{ct}, \ldots, t^{k-1}e^{ct} \}$

We will spend the next few classes working on the proof and the applications of the Jordan canonical form theorem.

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Invariant Subspaces

In analysing a linear transformation $T: V \to V$, it will help to break up the space V into a direct sum of simpler (smaller)