Read Section 7.1 and answer the following questions.

1. Let T be a linear operator on a finite dimensional complex vector space. Is the Jordan canonical form for T completely determined (up to reordering blocks) by the characteristic polynomial $p_T(t)$? Why or why not?

2. Let T be a linear operator on a vector space V and let λ be an eigenvalue of T.

   (a) What is the generalized eigenspace of T corresponding to λ?

   (b) How does this generalized eigenspace corresponding to λ relate to the eigenspace E_λ?

   (c) What is the dimension of the generalized eigenspace of T corresponding to λ?

3. Let T be a linear operator on a finite-dimensional vector space. What must be true about the characteristic polynomial to guarantee T has a Jordan canonical form?