1. Prove that eigenvectors for *two* distinct eigenvalues are linearly independent:

   (a) State clearly what you have to work with, e.g. introduce relevant characters and say what you know about them.

   (b) State clearly what you are trying to prove, in terms of your set-up from part (a).

   (c) How can you use what you know to get where you want? Come up with a proof of the statement in (1). Hints are available, if desired.

2. Prove that eigenvectors for *three* distinct eigenvalues are linearly independent.

3. Do you see how this will work for n distinct eigenvalues? Can you prove it?