PROBLEM 2, PROBLEM SET 8. GERARDO CON DIAZ

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This is the type of question you should learn how to solve almost as soon as you see it. Here's part a: let v be an eigenvalue for T with eigenvalue λ. Then $T(Tv) = T(\lambda v) = \lambda T(v) = \lambda^2 v$. So we're done.

Here's part b: With the notation as before, but if T is invertible, then the statement $Tv = \lambda v$ implies, after multiplying by $T-1$, $v = T^{-1}(\lambda v)$, so that $T-1(v)\lambda^{-1}v$, since λ is non-zeo by definition.