Prove: If T is a linear operator on the vector space V and T has an inverse and U is any other linear operator on V , then TU and UT have the same characteristic polynomial. (This will be like the proof that two similar matrices have the same characteristic polynomial. You can use the fact that if $β$ is any basis for V , then $\left[T\right]\_{β}$ has an inverse and that for any two matrices, A and B, det(A) det(B) = det(AB).)