Let X be a nonsingular matrix with columns $X_1, X_2, \ldots, X_n$. Let Y be a matrix with columns $X_2, X_3, \ldots, X_n, 0$. Show that the matrices $A = YX^{-1}$ and $B = X^{-1}Y$ have rank $n-1$ and have only 0's for eigenvalues.