MATH 307

Individual Homework 17

Instructions: Read textbook pages 89 to 94 before working on the homework problems. Show all steps to get full credits.

1. If $A = U\Sigma V^*$ is a singular value decomposition of a square matrix A, then A is invertible if and only if all diagonal entries of Σ are nonzero. Assuming that A is invertible, write A^{-1} in terms of factors of the singular value decomposition of A.
2. If all singular values of $A \in F^{m\times n}$ with $m > n$ are positive, is A^*A invertible? How about AA^*? Use SVD to justify your answers.