Quiz 3 Math 544, September 28, 2020

Let A and B be nonsingular $n \times n$ matrices. Prove that the matrix AB is nonsingular.

Answer: Let v be a vector in $\mathbb{R}^n$ with $(AB)v = 0$. We prove that $v = 0$. Observe that

$$0 = (AB)v = A(Bv).$$

The matrix A is nonsingular; hence Bv must be zero. The matrix B is nonsingular; hence v must be zero.