LINEAR ALGEBRA
SPRING 2021

ASSIGNMENT 7.1
DUE MARCH 24

2.2. # 20, 31, 33–35

Exercise 1. Let A, B be a $n \times n$ matrices, and suppose that A is invertible. Prove that B is invertible if and only if ABA^{-1} is invertible, and that in this case we have $(ABA^{-1})^{-1} = AB^{-1}A^{-1}$.

Exercise 2. Let A, B be $n \times n$ matrices.

a. Suppose that $AB = I$. Use the Invertible Matrix Theorem to show that A is invertible, and that $B = A^{-1}$.

b. Suppose that $BA = I$. Use the Invertible Matrix Theorem to show that A is invertible, and that $B = A^{-1}$.

This shows that for square matrices, the existence of a one-sided inverse (on either side) is equivalent to the existence of a two-sided inverse. Practically speaking, this means that in order to check that $B = A^{-1}$, we need only show that $AB = I$ *or* $BA = I$.