Math 54: Worksheet #6

Name: _____   Date: September 16, 2021

Fall 2021

Problem 1 (True/False). If A is invertible, then the inverse of A^{-1} is A^T.

Problem 2 (True/False). Suppose A is an $n \times n$ matrix. If there is an $n \times n$ matrix D such that $AD = I$, then there is also an $n \times n$ matrix C such that $CA = I$.

Problem 3 (True/False). If A and B are $n \times n$ matrices such that AB is invertible, then both A and B are invertible.

Problem 4 (True/False). A 5×5 matrix A whose columns don't span $\mathbb{R}^5$ can be invertible.

Problem 5 (2.2 #17)**.** Solve the equation $AB = BC$ for A assuming that all the matrices are square and B is invertible.

Problem 6 (2.2 #31)**.** Find the inverse of the following matrix, if it exists:

$$\begin{bmatrix} 1 & 0 & -2 \\ -3 & 1 & 4 \\ 2 & -3 & 4 \end{bmatrix}$$

Problem 7 (2.3 #31-ish)**.** Suppose A is an $n \times n$ matrix with the property that $A\underline{x} = \underline{b}$ has at least one solution for each $\underline{b} \in \mathbb{R}^n$. Explain why $A\underline{x} = \underline{b}$ actually has exactly one solution for each $\underline{b} \in \mathbb{R}^n$.