Math 165 Written Homework 8
Due Friday. March 29 at 11:59 pm on gradescope

Problems

Question (1)

1. Let $A = \begin{bmatrix} 2 & 0 & -10 & -1 & 7 & 0 \\ 2 & 6 & 2 & -1 & 7 & -4 \\ 1 & 6 & 7 & 0 & 4 & -1 \\ 3 & 5 & -5 & 0 & 12 & -13 \end{bmatrix}$

2. Determine a basis for the column space of A.

3. Find the RREF form of A.

4. Write each column c_i of A not included in your basis as a linear combination of the columns that are included in the basis. (Hint: Suppose E is the RREF form of A. If it were true that column 2 of E is equal to 2 times column 1 of E, then $(2, -1, 0, 0, 0, 0)$ is in the nullspace of E.)

Question (2)

Answer the following True or False and **justify your answer**.

1. Suppose A is a 6×10 matrix of rank 6. Then the nullspace of A is a subspace of $\mathbb{R}^{10}$ of dimension 4.

2. A matrix of dimension 5×7 can have n independent columns, where n is any whole number from 0 to 7.

3. Let A be an $n \times n$ matrix. Then A is invertible if and only if its columns constitute a spanning set for $\mathbb{R}^n$.