

Practice #8 - Linear Algebra

1. Suppose that A is a 6×8 matrix. If the dimension of the row space of A is 5, what is the dimension of the column space of A ?
2. Suppose that A is a 9×7 matrix. If the dimension of $\text{col}(A)$ is 5, what is the dimension of $\text{row}(A)$?
3. Suppose that A is a 9×7 matrix that has an echelon form with one zero row. Find the dimensions of the column space of A , the row space of A and the null space of A .
4. A 5×13 matrix A has a null space of dimension 10. What is the rank of A ?
5. Suppose that A is a 6×11 matrix and that $T(\mathbf{x}) = A\mathbf{x}$. If $\text{nullity}(A) = 7$, what is the dimension of the range of T ?
6. Suppose that A is a 17×12 matrix and that $T(\mathbf{x}) = A\mathbf{x}$. If $\text{rank}(A) = 8$, what is the dimension of the kernel of T ?
7. Suppose that A is a 5×13 matrix and that $T(\mathbf{x}) = A\mathbf{x}$. If T is onto, then what is the dimension of the null space of A ?
8. (True/False) If A is a square matrix, then $\text{row}(A) = \text{col}(A)$.
9. (True/False) The rank of A cannot exceed the number of rows of A .
10. (True/False) If \mathbf{y} is a solution to $A\mathbf{x} = \mathbf{b}$, then \mathbf{y} is in $\text{row}(A)$.