Quiz 5 Class 20

Linear Algebra I Section:

NAME & ID(Please print legibly) Week 6

PLEASE SHOW ALL YOUR WORK.

1. Find a 3 by 3 matrix A whose column space is the plane $x + y + z = 0$ in $\mathbb{R}^3$.

2. Suppose A is an $m \times n$ matrix of rank r.

   a. If $Ax = b$ has a solution for every right side b, what is the column space of A.

   b. In part (a), what are all equations or inequalities that must hold between the numbers m, n, r.

   c. Give a specific example of rank 1 with first row $[2 \quad 5]$. Describe the column space $C(A)$ and the nullspace $N(A)$ completely.

   d. Suppose the right side b is the same as the first column in your example (part c). Find the complete solution to $Ax = b$.