Quiz #2 (CSE 4190.313)

Tuesday, April 9, 2019

Name: _____   **ID No:** _____

1. (6 points) Suppose A is the sum of two matrices of rank one: $A = \mathbf{u}\mathbf{v}^T + \mathbf{w}\mathbf{z}^T$.

   (a) (3 points) Which vectors _____ span the column space of A?

      Which vectors _____ span the row space of A?

   (b) (3 points) The rank is less than 2 if _____ or if _____.

2. (6 points) If the rows of an $m \times n$ matrix A are linearly independent, then the rank is _____,

   the column space is _____, and the left nullspace is _____.

3. (8 points) Reduce the following matrix A to a reduced echelon form R:

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 2 & 4 & 5 & 7 \\ 0 & 0 & 1 & 2 & 2 \end{bmatrix}.$$

Find a special solution for each free variable and describe every soluition to $A\mathbf{x} = \mathbf{0}$.