MTH 261
Linear Algebra
Summer 2017

Basis and Dimension

Find partners, and follow the instructions. You will not turn this in, but you must be working diligently to get attendance credit.

For each matrix A below, respond to each of the following:

- Find a basis for Nul A.

- What is the dimension of Nul A (the nullity of A)?

- Find a basis for Col A.

- What is the dimension of Col A (the rank of A)?

- What is (rank A) + (nullity A)? (Do you notice any pattern once you have completed this for all four?)

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

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

3. $\begin{bmatrix} 1 & 2 & 0 & 1 & 1 \\ 0 & -1 & 1 & 1 & 2 \\ 1 & 0 & 3 & 3 & 6 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 0 & 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 \end{bmatrix}$