Name _____ ID_____

2110201 Quiz 1 7 Feb 2019: Basic Skills

1. (4 points) Find the reduced row echelon of the following matrices.

   a. $\begin{bmatrix} 0 & 2 & 3 & 2 \\ 0 & 5 & 2 & 5 \\ 1 & 0 & 5 & 6 \end{bmatrix}$

   b. $\begin{bmatrix} 5 & 5 & 2 & 2 \\ 0 & 6 & 11 & 5 \\ 2 & 2 & 3 & 3 \end{bmatrix}$

Name _____ ID_____

2. (1 point) Write the system of linear equations defined by the following augmented matrix.

$$\left[\begin{array}{cccccc|c} 1 & 2 & 2 & 0 & 1 & 1 \\ 1 & 1 & 2 & 3 & 2 & 2 \\ 0 & 0 & 0 & 1 & 1 & 3 \end{array}\right]$$

3. (1 point) Let $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ and $x = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$.
   a. Show how Ax can be computed using dot product.
   b. Show how Ax can be computed as a linear combination of the columns of A
   c. Find Ax.

Name _____ ID_____

4.(4 points) Find the solution set of the systems of linear equations defined by the following augmented matrices. Compute the augmented matrices in RRE form. Identify homogeneous and particular parts of the solution. State which are pivot and free variables.

a. $\left[\begin{array}{cccccc|c} 1 & 2 & 2 & 0 & 1 & 1 \\ 0 & 1 & 2 & 0 & 2 & 2 \\ 0 & 0 & 0 & 1 & 1 & 3 \end{array}\right]$

b. $[0 \quad 0 \quad 2 \quad 4 \mid 8]$

c. $\left[\begin{array}{cccccc|c} 1 & 2 & 0 & 3 & 0 & 0 & 4 \\ 0 & 0 & 1 & 2 & 0 & 0 & 5 \\ 0 & 0 & 0 & 0 & 1 & 0 & 6 \\ 0 & 0 & 0 & 0 & 0 & 1 & 7 \end{array}\right]$

d. $\left[\begin{array}{ccc|c} 1 & 0 & 0 & 2 \\ 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{array}\right]$