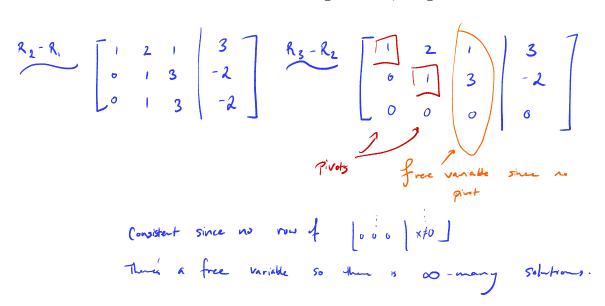
## Math 20580 (L.A. and D.E.) Tutorial Quiz 1

1. Given the augmented matrix below corresponding to a linear system of equations, determine how many solutions the system has (if any). Also, if the corresponding linear system is consistent, determine the number of free variables it has.

$$\left[\begin{array}{ccc|ccc}
1 & 2 & 1 & 3 \\
1 & 3 & 4 & 1 \\
0 & 1 & 3 & -2
\end{array}\right]$$



2. Determine the general solution to the system of equations below.

$$2x_1 + x_2 = 3$$
$$6x_1 + 4x_2 = 1.$$

$$\begin{bmatrix} 2 & 1 & | & 3 \\ 6 & 4 & | & 1 \end{bmatrix} \xrightarrow{R_2 - 3R_1} \begin{bmatrix} 2 & 1 & | & 3 \\ 0 & 1 & | & -8 \end{bmatrix} \xrightarrow{R_1 - R_2} \begin{bmatrix} 2 & 0 & | & 12 \\ 0 & 1 & | & -8 \end{bmatrix}$$

$$x_1 = -8$$
 and  $2x_1 = 12 \Rightarrow x_2 = 6$   $x_2 = -8$