**ECO 134: Applied Mathematics I**

**In-Class Worksheet 5**

Chapter 4

1. Compute the matrix multiplications:

$$\left[\begin{matrix}1&2&3\end{matrix}\right]\left[\begin{matrix}1\\2\\3\end{matrix}\right] and \left[\begin{matrix}1\\2\\3\end{matrix}\right]\left[\begin{matrix}1&2&3\end{matrix}\right]$$

1. Compute the matrix multiplication:

$$\left[\begin{matrix}1&0&2\\-1&1&3\end{matrix}\right]\left[\begin{matrix}1&2\\3&4\\5&6\end{matrix}\right]$$

$$\left[\begin{matrix}-2&-6\\-4& 3\\\begin{matrix} 5\\ 4\end{matrix}&\begin{matrix} 0\\-6\end{matrix}\end{matrix}\right]∙\left[\begin{matrix}2&-2&2\\-2&0&-3\end{matrix}\right]$$

1. Write the following system as a matrix equation for $x,y and z$

$$y+z=4$$

$$2x-y=z$$

1. Write this matrix equation as a system of 3 equations. Solve for x, y, z:

$$\left[\begin{matrix}1&1&1\\0&1&1\\0&0&1\end{matrix}\right]\left[\begin{matrix}x\\y\\z\end{matrix}\right]=\left[\begin{matrix}4\\3\\1\end{matrix}\right]$$

1. Compute the following matrix multiplication:

$$\left[\begin{matrix}1&2\end{matrix} \begin{matrix}3&4\end{matrix}\right]\left[\begin{matrix}4\\5\\6\end{matrix}\right]$$

1. Graphically depict the following matrix operations using matrices $v=\left[\begin{matrix}3\\5\end{matrix}\right]$ and $u=\left[\begin{matrix}1\\6\end{matrix}\right]$
* $v+u$
* $3v-2u$
1. Find $A^{-1}$

$$A=\left[\begin{matrix}3&4\\5&7\end{matrix}\right] $$