Math 3160 - Quiz 2

Name:_____

1. Let $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 0 & -1 \\ 0 & 1 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 0 & -1 \\ -1 & 2 & 0 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 0 \\ -3 & 0 \\ -1 & 1 \end{bmatrix}$

   Compute the following: AB, AC, BC, CB

2. for the matrices A, B,C, D and X. Solve the following equations for the matrix X assuming the inverse exists whenever needed.

   (a) $AX = B$

   (b) $AB = XB + 3X$

3. Compute the inverse matrix for the following (if it exists):

   $A = \begin{bmatrix} 2 & 1 \\ 3 & 0 \end{bmatrix}$ $B = \begin{bmatrix} 1 & -2 & 0 \\ 0 & 3 & 1 \\ 0 & 1 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & -2 & 0 \\ 0 & 3 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

4. Solve the following systems of linear equations using matrices. First write as a matrix equation $AX = \mathbf{b}$ and then find A^{-1} and compute $A^{-1}\mathbf{b}$

   (a) $\begin{cases} 2x_1 & -5x_2 & = 2 \\ x_1 & -3x_2 & = 2 \end{cases}$

   (b) $\begin{cases} x_1 & -2x_2 & & = -3 \\ & 3x_2 & +x_3 & = 9 \\ & x_2 & +x_3 & = 5 \end{cases}$