Name: _____   R. Hammack   Score: _____

Directions: Please answer all questions in the space provided.
Use of calculators or any form of electronic communication device is strictly forbidden on this quiz.

1. For this problem, $A = \begin{bmatrix} 2 & 3 & -1 \\ 1 & 5 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -1 \\ -2 & 1 \end{bmatrix}$, $C = \begin{bmatrix} -2 \\ 4 \end{bmatrix}$, and $D = \begin{bmatrix} -2 & 0 \end{bmatrix}$.

   Preform the indicated operations or state that they are not possible.

   (a) $BA = \begin{bmatrix} 2 & -1 \\ -2 & 1 \end{bmatrix} \begin{bmatrix} 2 & 3 & -1 \\ 1 & 5 & 5 \end{bmatrix} = \begin{bmatrix} 3 & 1 & -7 \\ -3 & -1 & 7 \end{bmatrix}$

   (b) $A^T C = \begin{bmatrix} 2 & 1 \\ 3 & 5 \\ -1 & 5 \end{bmatrix} \begin{bmatrix} -2 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \\ 14 \\ 22 \end{bmatrix}$

   (c) $B^{-1} = \dfrac{1}{2-2} \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$ Operation can't be done because it involves division by 0. No inverse exists.

   (d) $CD = \begin{bmatrix} -2 \\ 4 \end{bmatrix} \begin{bmatrix} -2 & 0 \end{bmatrix} = \begin{bmatrix} 4 & 0 \\ -8 & 0 \end{bmatrix}$

2. Solve the equation $X - 3B + 2I_2 = O$ for X.

$$\begin{aligned}
X - 3B + 2I_2 &= O \\
X &= 3B - 2I_2 \\
X &= 3 \begin{bmatrix} 2 & -1 \\ -2 & 1 \end{bmatrix} - 2 \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \\
X &= \begin{bmatrix} 6 & -3 \\ -6 & 3 \end{bmatrix} + \begin{bmatrix} -2 & 0 \\ 0 & -2 \end{bmatrix} \\
X &= \begin{bmatrix} 4 & -3 \\ -6 & 1 \end{bmatrix}
\end{aligned}$$