

Name: _____

Hammack

Score: 12/12

Put away phones, calculators, smart watches, etc. Answer in the space provided.

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 $D = \begin{bmatrix} -2 & 0 \end{bmatrix}$.

(a) $-\frac{1}{2}B = \frac{1}{2} \begin{bmatrix} 2 & -1 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} -1 & 1/2 \\ 1 & -1/2 \end{bmatrix}$

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

(c) $DBA = D(BA) = \begin{bmatrix} -2 & 0 \end{bmatrix} \begin{bmatrix} 3 & 1 & -7 \\ -3 & -1 & 7 \end{bmatrix} = \begin{bmatrix} -6 & -2 & 14 \end{bmatrix}$

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

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

(f) Solve the equation $X - 3B + 2I_2 = O_{22}$ for X .

$$\begin{aligned} X - 3B + 2I_2 &= O_{22} \\ X &= O_{22} + 3B - 2I_2 \\ X &= \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} + 3 \begin{bmatrix} 2 & -1 \\ -2 & 1 \end{bmatrix} - 2 \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \\ X &= \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} + \begin{bmatrix} 6 & -3 \\ -6 & 3 \end{bmatrix} + \begin{bmatrix} -2 & 0 \\ 0 & -2 \end{bmatrix} \\ X &= \begin{bmatrix} 4 & -3 \\ -6 & 1 \end{bmatrix} \end{aligned}$$