

Instructions: Clearly answer each of the questions below. Remember to check the back side. Show your work and any formulas you employ. Simplify all answers as far as possible.

1. (1 pt) If A and B are 7×7 matrices, which of the following equations is not always true? B

(a) $(AB)^T = B^T A^T$

(b) $(AB)^{-1} = A^{-1} B^{-1}$

(c) $AIA^{-1} = I$

(d) $2B - B = B$

2. (1 pt) Is this matrix invertible? $\begin{bmatrix} 0 & 1 & 7 \\ 0 & 0 & 0 \\ 1 & 7 & 7 \end{bmatrix}$ no

3. (1 pt) Is this matrix invertible? $\begin{bmatrix} 0 & 1 & 7 \\ 0 & 7 & 1 \\ 0 & 7 & 7 \end{bmatrix}$ no

4. (1 pt) Is this matrix invertible? $\begin{bmatrix} 1 & 0 & 7 \\ 0 & 7 & 1 \\ 0 & 0 & 7 \end{bmatrix}$ yes

5. (4 pts) Calculate $\begin{bmatrix} 1 & 1 & 2 \\ -1 & -1 & -3 \\ -6 & -4 & 0 \end{bmatrix}^{-1}$

$$\begin{bmatrix} -6 & -4 & -\frac{1}{2} \\ 9 & 6 & \frac{1}{2} \\ -1 & -1 & 0 \end{bmatrix}$$