MTH 264 Introduction to Matrix Algebra. Summer 2023..   Spring 2023

HW4A. Written Homework 4A.   **Due Week 4 Wednesday 11:59PM**

Name:

Instructions: Upload a pdf of your submission to **Gradescope**. This worksheet is worth 20 points: up to 8 points will be awarded for accuracy of certain parts (to be determined after the due date) and up to 12 points will be awarded for completion of parts not graded by accuracy.

(1) Let $\mathbf{A_1} = \begin{pmatrix} 4 & 5 \\ 7 & 8 \end{pmatrix}$

  (a) Determine $\det(\mathbf{A_1})$.

  (b) How many solutions does the system $\mathbf{A_1} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ have?

(2) Let $\mathbf{A_2} = \begin{pmatrix} 2 & 2 & 2 \\ 1 & 2 & 3 \\ -2 & -8 & -10 \end{pmatrix}$

  (a) Determine $\det(\mathbf{A_2})$.

  (b) Is $\mathbf{A_2}$ invertible?

(3) Let $\mathbf{A_3} = \begin{pmatrix} 3 & 4 & -5 \\ 4 & 3 & -2 \\ 1 & 1 & -1 \end{pmatrix}$

    (a) Determine $\det(\mathbf{A_3})$.

    (b) Is the set $V = \left\{ \begin{pmatrix} 3 \\ 4 \\ 1 \end{pmatrix}, \begin{pmatrix} 4 \\ 3 \\ 1 \end{pmatrix}, \begin{pmatrix} -5 \\ -2 \\ -1 \end{pmatrix} \right\}$ linearly independent?

(4) Let $\mathbf{A_4} = \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$. Determine $\det(\mathbf{A_4})$.