

Matrix Homework

Due: November 8, 2023

Name:

Compute the following matrix multiplications

1. (10 points)

$$\begin{bmatrix} 1 & 4 & 0 \\ 0 & 2 & 1 \\ 4 & 1 & 4 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}$$

2. (10 points)

$$\begin{bmatrix} 2 & 6 & 2 \\ 3 & 0 & 3 \\ -4 & -1 & -4 \end{bmatrix} \begin{bmatrix} 6 \\ 0 \\ 8 \end{bmatrix}$$

3. (10 points)

$$\begin{bmatrix} 1 & 4 & 0 \\ 0 & 2 & 1 \\ 4 & 1 & 4 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

4. (10 points)

$$\begin{bmatrix} 1 & 4 & 0 \\ 0 & 2 & 1 \\ 4 & 1 & 4 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

5. (10 points) Find the rank of the following matrices. (Rank is the number of linearly independent rows or columns)

(a) (5 points)

$$\begin{bmatrix} 1 & 4 & 0 \\ 0 & 2 & 1 \\ 4 & 1 & 4 \end{bmatrix}$$

(b) (5 points)

$$\begin{bmatrix} 1 & 4 & 1 \\ -1 & 4 & -1 \\ 4 & 1 & 4 \end{bmatrix}$$