

LINEAR ALGEBRA - FALL 2024 - PROBLEM SET 2 - due 9/6

1) Calculate $\begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & -2 \\ 2 & 4 & -3 \end{bmatrix} \begin{bmatrix} 6 \\ 4 \\ -8 \end{bmatrix}$

2) Multiply $\begin{bmatrix} 2 & -5 & 6 \\ 7 & 1 & 1 \\ -3 & -4 & -6 \end{bmatrix} \begin{bmatrix} 5 & 5 & -1 \\ 6 & -5 & -1 \\ 0 & 3 & -2 \end{bmatrix}$

3) Find $\begin{bmatrix} 0 & -1 & 2 \\ 3 & 7 & -2 \\ 0 & 4 & -2 \end{bmatrix}^3$

4) Find $\begin{bmatrix} 2 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -3 \end{bmatrix}^9$

5) Calculate e^M where $M = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ to the third power of M . Hint: use Maclaurin expansion for e .