MATH 2130 LINEAR ALGEBRA
HOMEWORK 6
DUE 2025 OCTOBER 5

PROBLEM 1 (S4)

Show that $\{x+1, x+2, x^2+3x\}$ is a spanning set for $\mathcal{P}_2$.

PROBLEM 2 (S5)

Show that $\{(1,2,-4),(3,1,2),(1,1,-3)\}$ is linearly independent in $\mathbb{R}^3$.

PROBLEM 3 (S5)

Show that

$$\left\{\begin{bmatrix}2 & -1\\ 1 & 1\end{bmatrix}, \begin{bmatrix}0 & 2\\ 1 & 0\end{bmatrix}, \begin{bmatrix}4 & 0\\ 3 & 2\end{bmatrix}\right\}$$

is linearly dependent in $\mathrm{Mat}_{2\times 2}$.

PROBLEM 4 (P4)

Show that $\{(1,1,-2),(3,1,1),(-4,5,-1)\}$ is a basis for $\mathbb{R}^3$.

PROBLEM 5 (P4)

Show that $\{8x^2-2x+1, 3x^2+2x+1, x^2+x\}$ is a basis for $\mathcal{P}_2$.