MATH 2130 LINEAR ALGEBRA
HOMEWORK 3
DUE 2025 SEPTEMBER 14

PROBLEM 1 (S2)

Find the angle between the vectors $(4, 3, -1, 2)$ and $(1, 1, 3, -1)$ in $\mathbb{R}^4$.

PROBLEM 2 (P2)

Use Gauss-Jordan reduction to solve the system

$$4x_1 + 2x_2 - 5x_3 = -1,$$
$$2x_1 + 3x_2 - x_4 = 0,$$
$$x_1 - 4x_3 + 3x_4 = -5,$$

and

$$-x_2 - x_4 = 2.$$

PROBLEM 3 (P2)

Use Gauss-Jordan reduction to solve the system

$$2x + 3y + 4z = 8,$$
$$x - y + 2z = 3,$$

and

$$5x + 10z = 17.$$

PROBLEM 4 (P2)

Find the reduced echelon form of the matrix

$$\begin{bmatrix} 4 & 2 & -5 & 0 & -1 \\ 2 & 3 & 0 & -1 & 0 \\ 1 & 0 & -4 & 3 & -5 \\ 0 & -1 & 0 & -1 & 2 \end{bmatrix}.$$

PROBLEM 5 (P2)

Find the reduced echelon form of the matrix

$$\begin{bmatrix} -1 & -3 & -2 & -1 & 3 \\ -2 & 3 & 4 & 4 & 5 \\ 4 & 1 & 1 & -3 & -1 \\ 0 & 7 & 9 & 5 & 9 \end{bmatrix}.$$