

**MATH 2130 LINEAR ALGEBRA
HOMEWORK 2
DUE 2025 SEPTEMBER 7**

PROBLEM 1 (P1)

Use Gauss's method to solve the system

$$\begin{aligned}6x + 8y + 9z &= 0, \\ -3x - 4y + 3z &= 0,\end{aligned}$$

and

$$-x - y - 4z = 2.$$

PROBLEM 2 (P1)

For which values of k are there no solutions, many solutions, or a unique solution to the system

$$5x_1 + 2x_2 + x_3 - 3x_4 = 5$$

and

$$-10x_1 - 4x_2 - 2x_3 + 6x_4 = k + 2?$$

PROBLEM 3 (S1)

Describe the set of points on the plane through $(3, 4, 1)$, $(0, 1, 2)$, $(1, 2, 4)$. Does this plane pass through the origin?

PROBLEM 4 (S2)

Find the length of the vector $(1, -3, -2, 0, 4)$ in \mathbb{R}^5 .

PROBLEM 5 (S2)

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