Math 3120, Linear Algebra, Spring 2026, Worksheet 4

February 16, 2026

Name _____

1. Consider the vector $v = (1, 1, 2)$ and the vector $x = (2, -1, 0)$. Write x as a sum $x = x^{||} + x^{\perp}$ where $x^{||}$ is parallel to v and $x^{\perp}$ is perpendicular to v.

2. Consider the linear equation $x_1 + x_2 + 2x_3 = 0$, and the vector $a = (2, -1, 0)$. Find the distance between a and the nearest vector a' to a, which is a solution to this equation.