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Quiz 11 (B)

Question 1. (4 marks) Let V be the set of pairs of integers (x, y) . Define addition to be $(x_1, y_1) + (x_2, y_2) = (x_1 + x_2, y_1 + y_2)$ and scalar multiplication to be $k(x, y) = (kx, ky)$. Is V a vector space?

Question 2. (6 marks) Check axiom 1 (closure under addition) and axiom 6 (closure under scalar multiplication) for the following:

(a) The set of triples of the form $(-1, 0, x)$ with the usual addition and scalar multiplication.

(b) The set of 2×2 matrices $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ where $a + d = b + c$ with the usual matrix addition and scalar multiplication.