

Vector Spaces

Which of the following are vector spaces?

1. The set of convergent sequences of real numbers whose limit is 0.
2. The set of functions from \mathbb{Z} to \mathbb{Z} .
3. The set of differentiable functions $f : \mathbb{R} \rightarrow \mathbb{R}$ such that $\frac{d}{dx}f(x) = f(x)$.
4. The set of polynomials with real coefficients of degree exactly 3.
5. The set of matrices in REF.