# Differential Geometry

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# Chapter 1

# Manifolds

## 1.1 Linear Manifolds

**Proposition 1.1.1.** *Let $\mathfrak{M}$ be a finite-dimensional linear manifold in a normed linear space $\mathfrak{X}$. Then $\mathfrak{M}$ is closed.*

**Proposition 1.1.2.** *Let $\mathfrak{X}$ be a normed linear space. Let $\mathfrak{M}$ be a closed subspace of $\mathfrak{X}$. Let $\mathfrak{Z}$ be a finite dimensional subspace of $\mathfrak{X}$. Then $\mathfrak{M} + \mathfrak{Z}$ is closed in $\mathfrak{X}$.*