Theory of Optimization

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1 Unconstrained Minimization

Let $\mathbb{R}^n$ denote the n-dimensional Euclidean real vector space with the inner product defined for any $x, y \in \mathbb{R}^n$ as $\langle x, y \rangle = x^T y = \sum_{i=1}^{n} x_i y_i$, where $x = [x_1, \ldots, x_n]^T$ and $y = [y_1, \ldots, y_n]^T$ are the coordinates of x and y respectively. Let the norm and the metric on $\mathbb{R}^n$ be defined as $\|x\| = \sqrt{\langle x, x \rangle}$ and $d(x, y) = \|x - y\|$, respectively.