A real vector space $V$ equipped with an inner product $\langle \cdot, \cdot \rangle : V \times V \to \mathbb{R}$ satisfying

is called an \underline{inner product} space. A real vector space $V$ equipped with a norm $\| \cdot \| : V \to \mathbb{R}$ satisfying

is called a \underline{norm} space. A set $V$ equipped with a metric $d : V \times V \to \mathbb{R}$ satisfying

is called a \underline{metric} space. The Euclidean norm of a vector $x \in \mathbb{R}^n$ is defined as $\| x \| = \ldots$ and a ball with radius $\varepsilon$ around $x_0 \in \mathbb{R}^n$ is defined as $B_\varepsilon(x_0) = \ldots$.

A sequence $\{a_k\} \subset \mathbb{R}^n$ is called convergent if \underline{and it satisfies the Cauchy criterion provided \ldots}. The Bolzano–Weierstraß theorem says that \underline{A set $M \subset \mathbb{R}^n$ is called open if \underline{and it is called closed if \ldots}. Is it true that the intersection of arbitrarily many closed sets is closed? Yes No}. Is it true that the intersection of arbitrarily many open sets is open? Yes No. Let $M \subset \mathbb{R}^n$ and $x_0 \in \mathbb{R}^n$. Then $x_0$ is called an interior point of $M$ if \underline{, $x_0$ is called an exterior point of $M$ if \ldots, and $x_0$ is called a boundary point of $M$ if \ldots}. The set of all interior points of $M$ is denoted by $\underline{\text{and the closure of } M \text{ is defined by \ldots}}$. We derived two characterizations for a set $M$ to be closed: $M$ is closed iff \underline{\text{iff \ldots}}$. A set which is both closed and bounded is called \underline{closed}. The Heine–Borel theorem says that \ldots
A function $f : M \to \mathbb{R}^m$ with $M \subset \mathbb{R}^n$ is called continuous in $x_0 \in M$ if we showed that a function $f : M \to \mathbb{R}^m$ with $M \subset \mathbb{R}^n$ is continuous iff inverse images of sets are. The theorem that we proved about images of compact sets states that. The Extreme Value Theorem for functions $f : M \to \mathbb{R}$, $M \subset \mathbb{R}^n$ says that. A function $f : M \to \mathbb{R}^m$ with $M \subset \mathbb{R}^n$ is called uniformly continuous if and the theorem that we proved about uniformly continuous functions states that. A set $M \subset \mathbb{R}^n$ is called connected if , and the theorem that we proved about continuous images of connected sets states that. An arc is called rectifiable with arc length $L$ if $L = \sup L_z < \infty$, where $L_z =$. If the arc $x : [\alpha, \beta] \to \mathbb{R}^n$ is continuously differentiable, then it is rectifiable with arc length $L =$. A set is called arcwise connected if. Is it true that every connected set is arcwise connected? Yes No. Is it true that every arcwise connected set is connected? Yes No. A set $M \subset \mathbb{R}^n$ is called convex if. Suppose $M \subset \mathbb{R}^n$ is convex and $x_0 \in$. Then there exists $p_0 \in \mathbb{R}^n$ with. A function $f : M \to \mathbb{R}$ with $M \subset \mathbb{R}^n$ is called convex if.