AnalysisTheorems

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Chapter 1

realnumbers

Definition 1.1 (Bounded above)**.** *Given a set X, X is bounded above if there exists a C such that for all $x \in X$ $x \leq C$.*

Definition 1.2 (Supremum)**.** *Let $X \subset \mathbb{R}$ be bounded above. A number $C \in \mathbb{R}$ is called a supremum of X if C is an upper bound of X and whenever B is an upper bound of X, then $C \leq B$.*

Axiom 1.3 (Completeness axiom)**.** *For any nonempty set X bounded above there exists a supremum C of X.*

Lemma 1.4 (Subset of bounded set is bounded)**.** *Given a set X bounded above. For all subsets $Y \subset X$, Y is bounded above.*

Theorem 1.5 (Archimedes)**.** *Given $a, b \in \mathbb{R}$ with $b > 0$, there exists an $n \in \mathbb{N}$ such that $n * b > a$.*

Proof. □

Theorems!