# Weierstrass approximation theorem

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If $f$ is a continuous real-valued function on a interval $[a, b]$ then for all $\varepsilon > 0$ there exists a polynomial $P$ which satisfies $|f(x) - P(x)| < \varepsilon \quad \forall x \in [a, b]$ This theorem also holds for compact subsets of $\mathbb{R}^n$. The Stone-Weierstrass theorem is a generalization to even more general situations.