

2.4 Using Derivatives to Find Absolute Maximum and Minimum Values

Section Summary

- An *absolute minimum* of a function f is a value $f(c)$ such that $f(c) \leq f(x)$ for all x in the domain of f .
- An *absolute maximum* of a function f is a value $f(c)$ such that $f(c) \geq f(x)$ for all x in the domain of f .
- If the domain of f is a closed interval and f is continuous over that domain, then the *Extreme-Value Theorem* guarantees the existence of both an absolute minimum and an absolute maximum.

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Section Summary Concluded

- Endpoints of a closed interval may be absolute extrema, but not relative extrema.
- If there is exactly one critical value c such that $f'(c) = 0$ in the domain of f , then *Maximum-Minimum Principle 2* may be used. Otherwise, *Maximum-Minimum Principle 1* has to be used.