

Absolute Extrema on an Interval

p. 269 - 274 (4.2)

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Extrema: means the extreme values, i.e. the maximum/minimum y-values.

1. $f(c)$ is the **absolute (global) minimum** of f with domain D if $f(c) \leq f(x)$ for all x in the domain.
2. $f(c)$ is the **absolute (global) maximum** of f with domain D if $f(c) \geq f(x)$ for all x in the domain.

Extreme Value Theorem

If f is continuous on a closed interval $[a, b]$, then f has both an absolute maximum value and an absolute minimum value.

Using the graphs of the following functions, determine whether the extrema:

- A. may not exist
- B. are located on the endpoint(s)
- C. are located inside interval

Function

Interval

1. $-(x^4) - 3x^3 + 5 = f(x)$

$[-3, 1.5]$

(use calculator to draw)

2. $y = x^2 + 1$

$[0, 2)$

(sketch by hand)