

Absolute Extrema on a Closed Interval

To find absolute extrema on $[a, b]$, use the:

Candidates Test

- ① Find all the critical numbers and the endpoints.
- ② Evaluate the critical numbers and the endpoints.
- ③ Determine the highest & lowest y -values.

Sample conclusions:

$f(x)$ has an absolute maximum value of ... at $x = \dots$

$f(x)$ has an absolute minimum value of ... at $x = \dots$

Example 1:

Find the absolute extrema for $f(x) = x^4 - 8x^2$ on $[-1, 3]$.

Example 2:

Find the absolute extreme values for $f(x) = 2 \cos x + x$ on $\left[0, \frac{\pi}{4}\right]$.

Example 3:

Find the x -values of the absolute extrema for $f(x) = 2x + \frac{2}{x}$ on $[-1,4)$.