5.5 - ABSOLUTE EXTREMA

Definition: Absolute MAX if $f(c) \geq f(x)$ for all x in the domain of f.

Absolute MIN if $f(c) \leq f(x)$ for all x in the domain of f.

Extreme Value Theorem: A function f continuous on a closed interval [a, b] assumes both an absolute maximum and an absolute minimum on that interval.

- All absolute extrema (if they exist) must always occur at critical values or at endpoints.

1. f continuous over [a, b]?
2. Find critical values in (a, b).
3. Find *f(a), f(b), f(c).*
4. Absolute maximum is the largest of step 3. Absolute minimum is smallest of step 3.

Example:

Example:

Second Derivative Test for Absolute Extrema: Let f be continuous on I and c the only critical value in I. Then

Example:

Example:

5.5 HW # 11 – 61 (every other odd)