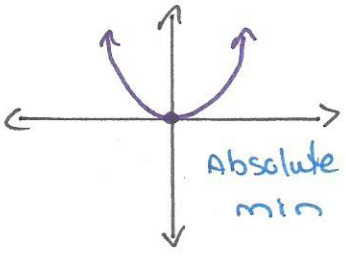
Extrema

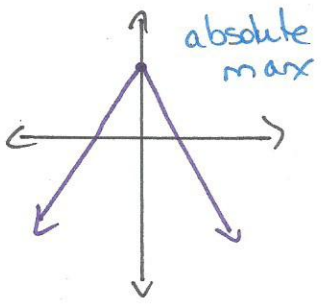
- When you look at the graph of a function, there are visual clues that provide information about the function
- These points are refered to as Critical points, which can either be a maximum point, minimum point, or point of inflection.

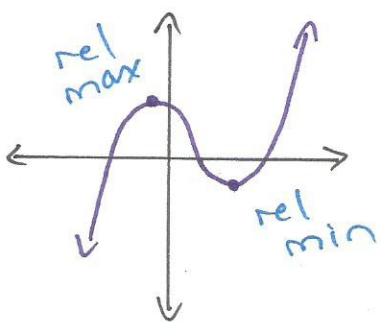
* - The greatest value of a function is referred to as the absolute max & the least value of a function is referred to as the absolute min.
- The general term for absolute max & min is extremum.

* - Functions can also have relative extrema.
  - relative max: may not be greatest value of function but at some interval it is the greatest value.
  - relative min: not the least value of function but at some interval it is the least value.

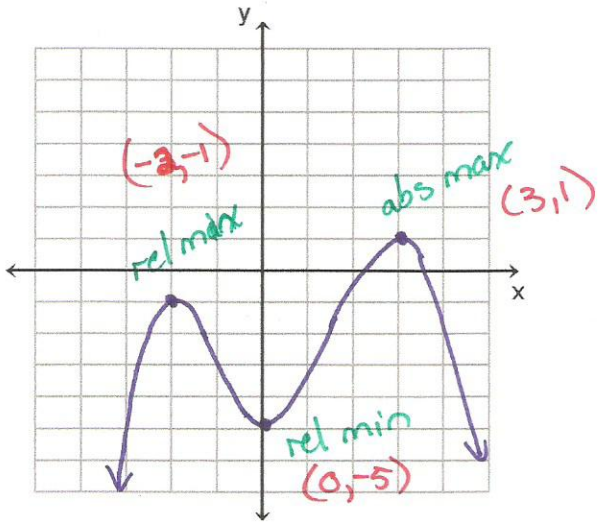
Examples:

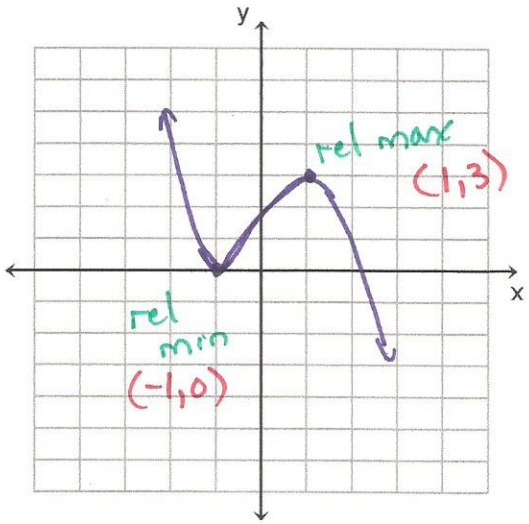


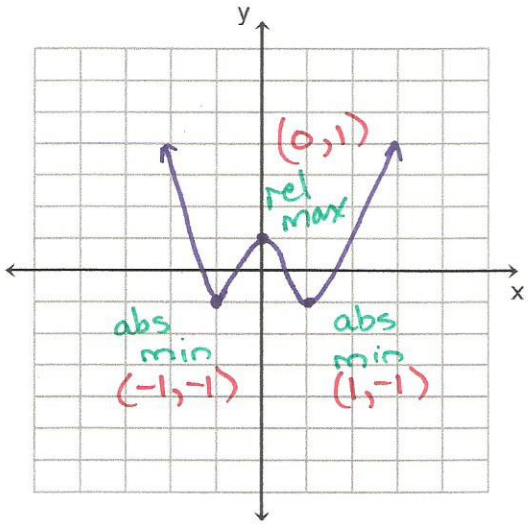


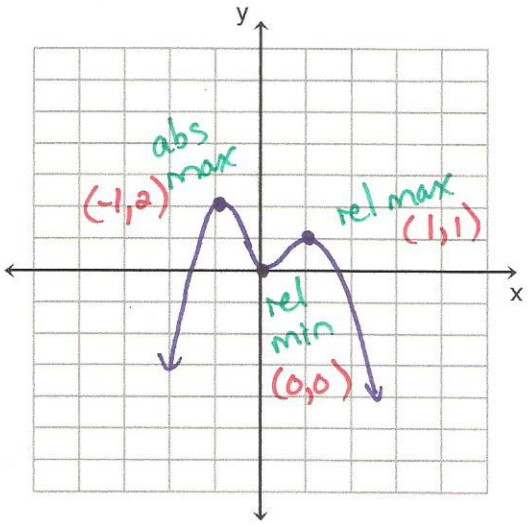


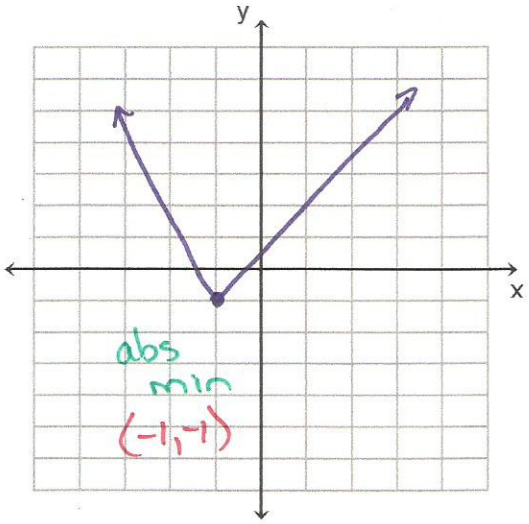
Extrema Cont...

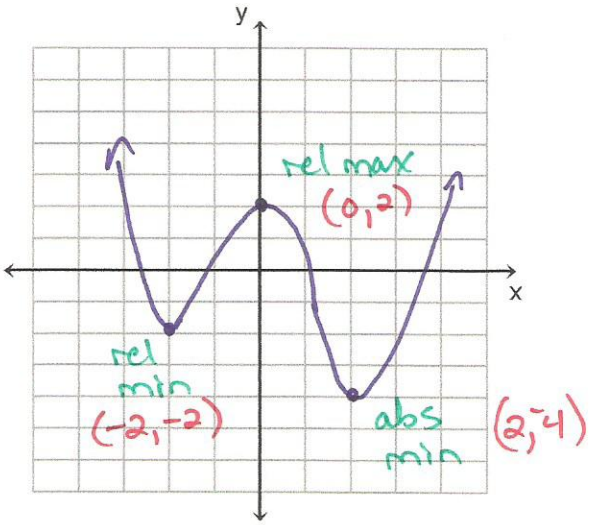






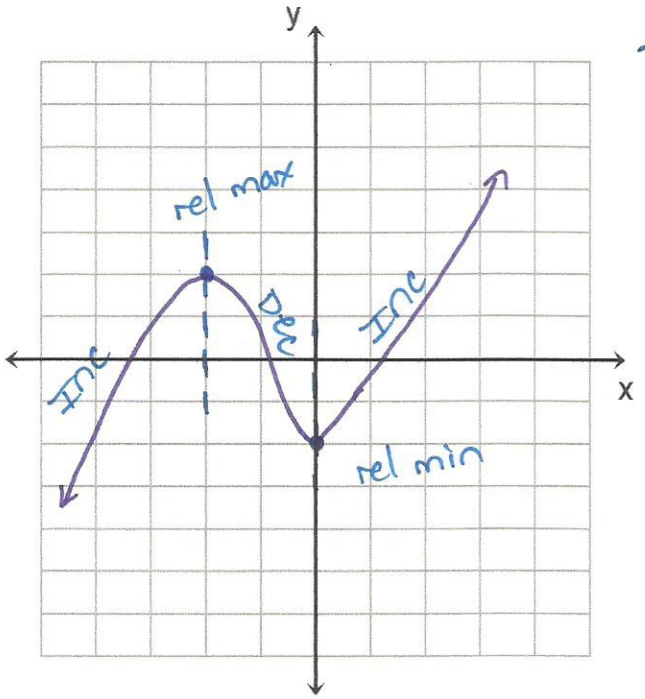






Extrema Cont'd.

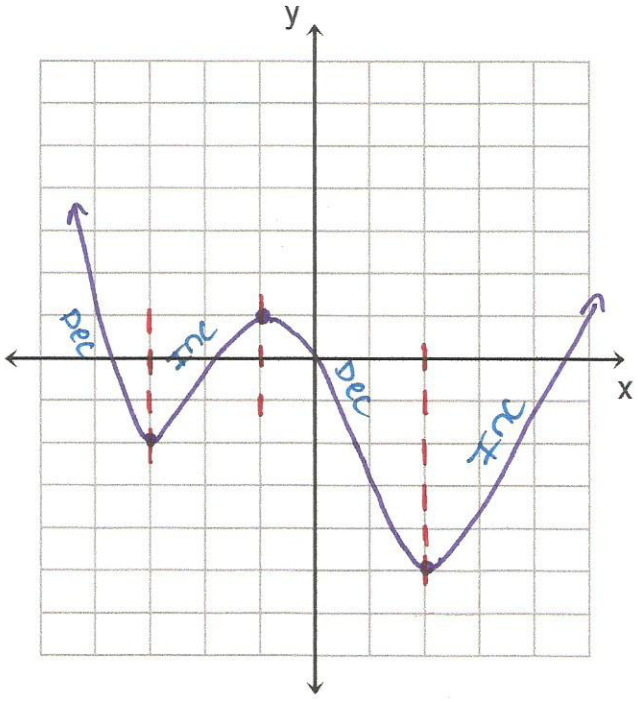
- between the extrema points, the graph has intervals of increase and decrease.
- to find intervals of increase & decrease, locate extrema and look at the graph between. Your domain is what you use for your interval.



→ start from left side "$-\infty$"

Inc: $(-\infty, -2)$ $(0, \infty)$

Dec: $(-2, 0)$



Inc: $(-3, -1)$ $(2, \infty)$

Dec: $(-\infty, -3)$ $(-1, 2)$