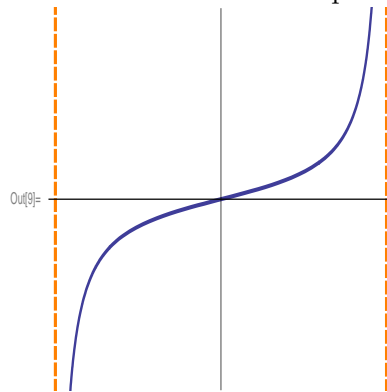
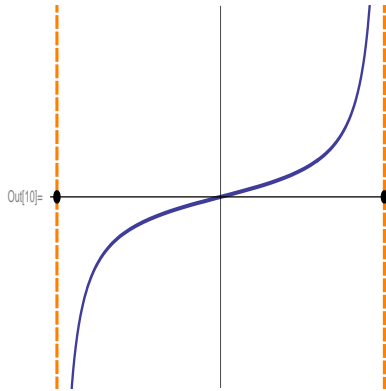


Cautionary Example 1 This graph gives an example of a continuous function on the open interval $(0, 1)$ which does not satisfy the conclusion of the Extreme value theorem. Hence no surprise that we didn't get the absolute max or min the theorem promises.



Cautionary Example 2 This second graph belongs to a function $f(x)$ defined on a closed interval which again neither has an absolute minimum nor an absolute maximum. (Notice that this function fails to be continuous on the interval $[0, 1]$ hence why the theorem cannot be used)



Before we can list the ways how we will find the absolute extremum we need one definition and two theorems.

Definition A number c in the domain of f is called a critical number(value) of f if $f'(c) = 0$ or $f'(c)$ not defined.

Fermat's Theorem Suppose that $f(c)$ is a local extremum. Then c must be a critical number of f .