First Derivative Test

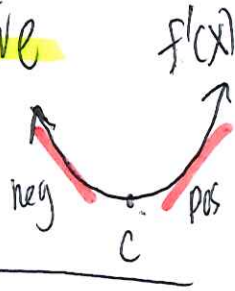
ES: what is the 1st derivative test?

Theorem

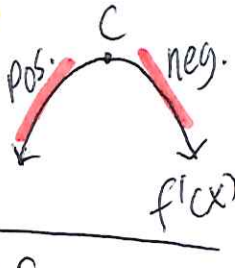
1st derivative test:

Let c be a critical number of a f(x) that is continuous on an open interval containing c. If f(x) is differentiable on the interval, except at c then f(c) can be described as follow:

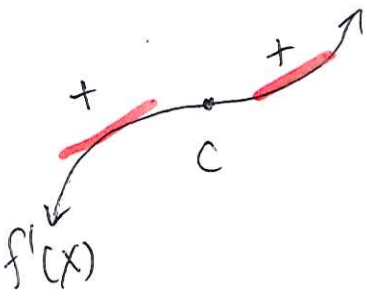
① if $f'(x)$ changes from negative to positive at c, then f(x) has a relative minimum at (c, f(c)).

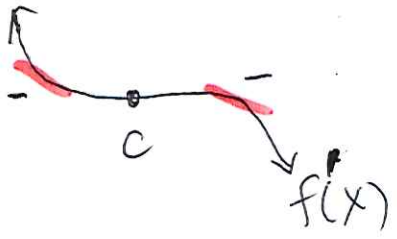


② if $f'(x)$ changes from positive to negative at c, then f(x) has a relative maximum at (c, f(c)).



③ if $f'(x)$ is positive on both sides of c or negative on both sides of c, then f(c) is neither a relative min nor max.





Summary