

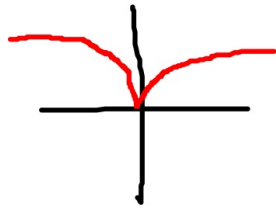
First Derivative

if $f'(x) > 0$ then $f(x)$ - increasing
if $f'(x) < 0$ then $f(x)$ - decreasing

if $f'(x) = 0$ or D.N.E. - possible max or min
 - possible horizontal tangent
 - possible cusp

First Derivative Test

if $f'(x) = 0$ or D.N.E. and sign change from pos. to neg. then $f(x)$ has a max
 neg. to pos. then $f(x)$ has a min



Second derivative

if $f''(x) > 0$, then $f(x)$ concave up
if $f''(x) < 0$, then $f(x)$ concave down

if $f''(x) = 0$ or D.N.E. and has a sign change,
then $f(x)$ has a point of inflection

Second Derivative Test for max/min

If $f'(x) = 0$ or D.N.E. and $f''(x) > 0$ then $f(x)$ has a min.
If $f'(x) = 0$ or D.N.E. and $f''(x) < 0$ then $f(x)$ has a max.

