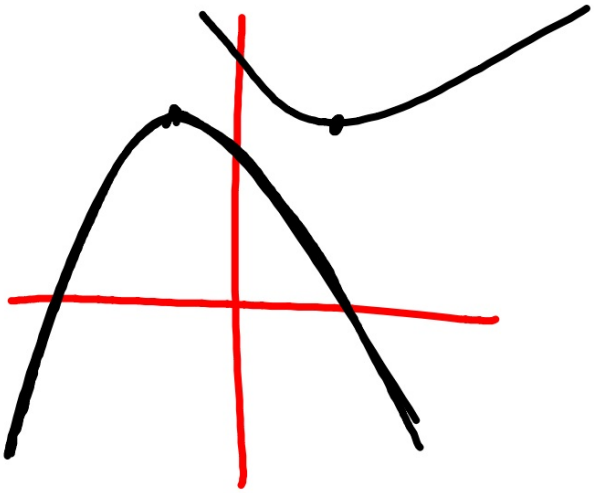
Trig 3.6



Find the extrema of a function

critical point (value, numbers)

maximum (absolute, relative)

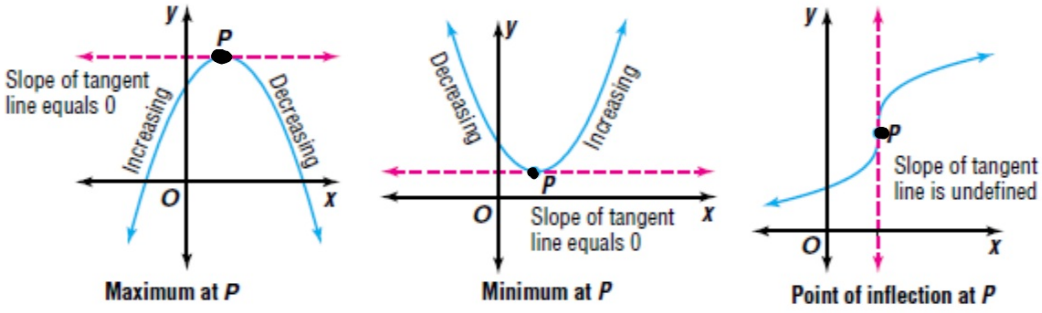
minimum (absolute, relative)

inflection point

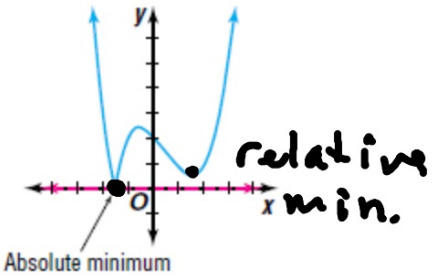
extrema (extremum): all max, min,
inflection points (only if they ask)

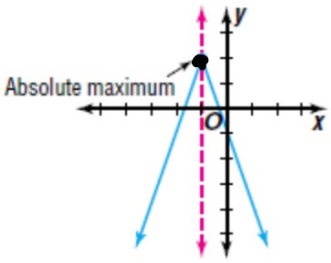
activity: graphing calculators/ trace/ table

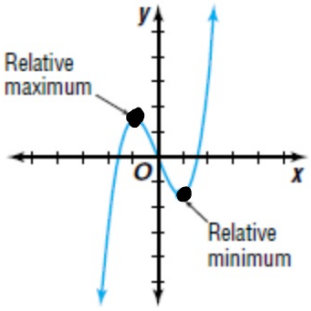
spaghetti follows curve



Where does slope change?


y
x
O
Absolute minimum
relative min.

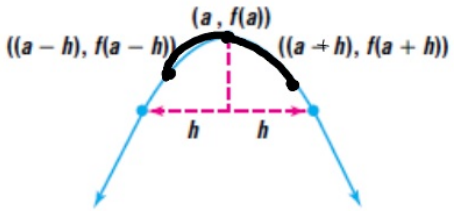

y
Absolute maximum
O
x


y
Relative maximum
O
x
Relative minimum

Don't overthink this...
Mountaintops
Valleys
Other

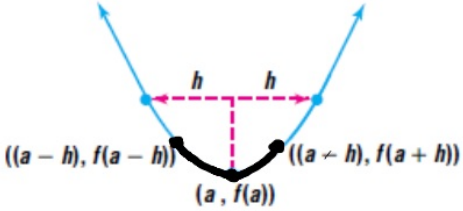
Critical Points

For $f(x)$ with $(a, f(a))$ as a critical point and h as a small value greater than zero



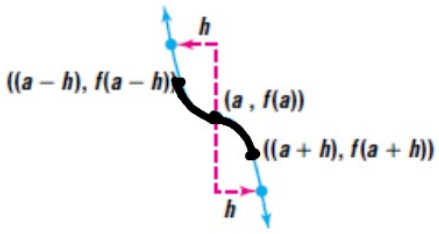
"lower-higher-lower"

$f(a)$ is a maximum.



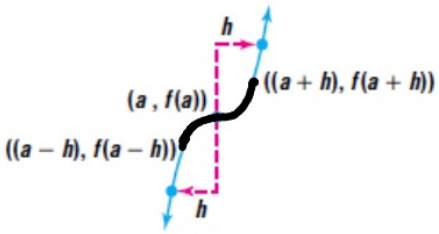
"higher-lower-higher"

$f(a)$ is a minimum.



"higher-pause-lower"

$f(a)$ is a point of inflection.



"lower-pause-higher"

$f(a)$ is a point of inflection.

Critical point: something interesting is happening here
at x= *whatever.*
What is it?
Estimate (graph) by eyeball
Prove it! (table) look at y-coords.

$2x^5 - 5x^4 - 10x^3$

3 The function $f(x) = 2x^5 - 5x^4 - 10x^3$ has critical points at $x = -1$, $x = 0$, and $x = 3$. Determine whether each of these critical points is the location of a maximum, a minimum, or a point of inflection.