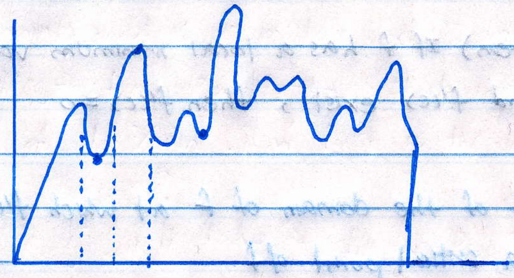
10/25/12

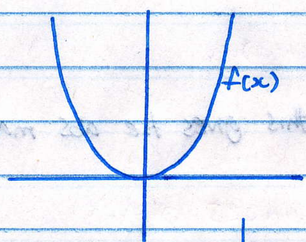
Maxima and minima



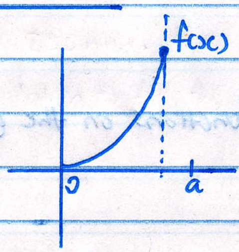
Def Let f be defined on an interval I containing c. Then f has an absolute maximum value on I at c. If $f(c) \geq f(x)$ for all $x \in I$

—— " —— " —— " —— " —— " absolute minimum of $f(c) \leq f(x)\ \forall x \in I$

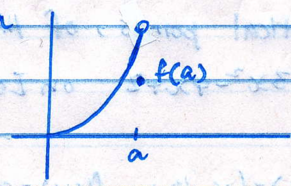
Eg)



$f(x)$ has no abs max on $(-\infty, \infty)$, has an abs min at $0 \in (-\infty, \infty)$



If we restrict x to $[0, a]$ then $f(x)$ has an absolute min at $x=0$, and an abs. max at $x=a$



Theorem : (EVT = Extrem value theorem). A function that is continuous on a closed interval has an abs max value and an abs min value on that interval.

Def (Local max and Local min) Suppose I is an interval on which f is defined and c is an interior point of I. If $f(c) \geq f(x)$ for all x in some open interval $\in I$ and containing c, then c is said to be a local maximum of f

—— " —— " —— " —— " —— " —— $f(c) \leq f(x)$ —— " —— local minimum of f.