

EXTREMA AND GRAPHS

DEF.

Let f be a function defined on an interval I :

- $f(x_m)$ is the **global minimum** of f on I if $f(x_0) \leq f(x)$, $\forall x \in I$.
- $f(x_M)$ is the **global maximum** of f on I if $f(x_0) \geq f(x)$, $\forall x \in I$.

DEF.

Let f be a function defined on an interval I , if we have an open interval I_1 containing x_0

- $f(x_0)$ is a **local minimum** of f on I if $f(x_0) \leq f(x)$, $\forall x \in I_1$.
- $f(x_0)$ is a **local maximum** of f on I if $f(x_0) \geq f(x)$, $\forall x \in I_1$.

DEF.

Let f be a function defined at x_0 . f has a **critical point** at x_0 if $f'(x_0) = 0$ or $f'(x_0)$ does not exist.

THEOREM

If f has a local maximum or minimum at x_0 , then x_0 is a critical point of f .