

Def: Function $f: \mathbb{R} \rightarrow \mathbb{R}$ is

increasing at x_0 : $f'(x_0) \geq 0$

strictly

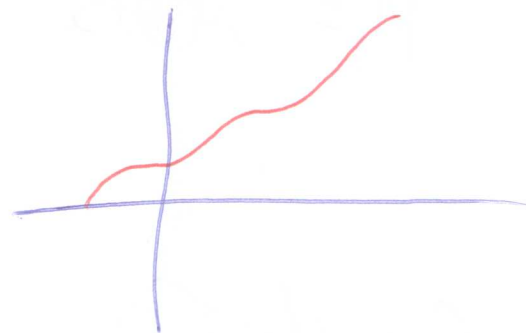
$\neq$

decreasing at x_0

$f'(x) \leq 0$

strictly — " —

$\neq$

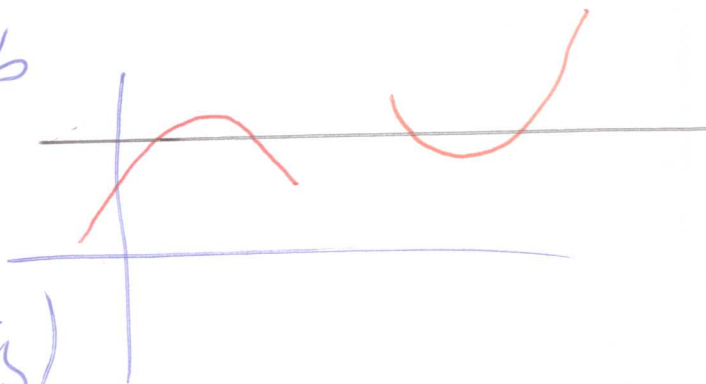


Note: f continuous on the interval from a to b

then f is one-to-one ~~if and only if~~

(f is always ^{strictly} increasing or f always decreasing)

strictly



Ex: $f(x) = \exp(x)$. $f'(x) = \exp(x) \neq 0 \Rightarrow f$ is strictly increasing
 $\Rightarrow f$ is one-to-one

Def: A point x_0 is a critical point for the function f
if $f'(x_0) = 0$

Critical Point:

$$f'(x_0) = 0$$

$\swarrow$ local maximum
 --- local minimum
 $\searrow$ Saddle

Turning Point

$$f''(x_0) = 0$$

Table VI.1 Notes

1	2	3	4	5	6
-10	-18	-13	7	17	32
7	8	9	10	11	12
31	6	-1	29	34	3

crit. pt.

	$f'(x) > 0$	$f'(x) = 0$	$f'(x) < 0$
$f''(x) < 0$			
$f''(x) > 0$			