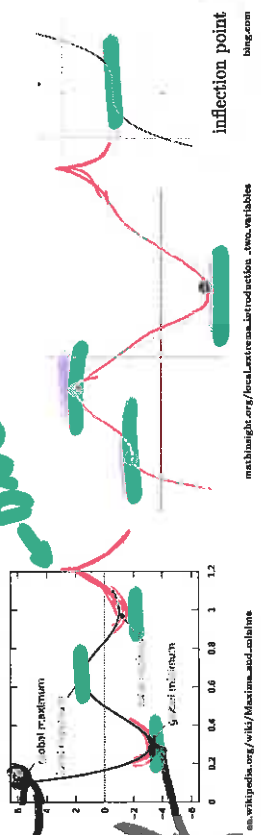


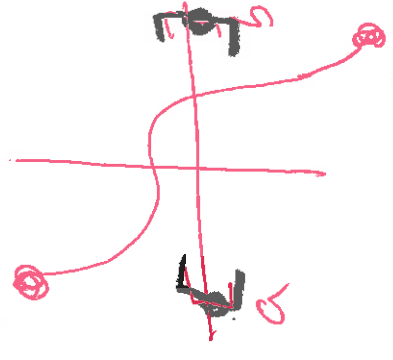
global max = absolute max

Calc 1 (one independent variables)

If $f(t_0)$ is a local maximum or local minimum, then $f'(t_0) = 0$ or DNE.



$f: [a, b] \rightarrow \mathbb{R}$

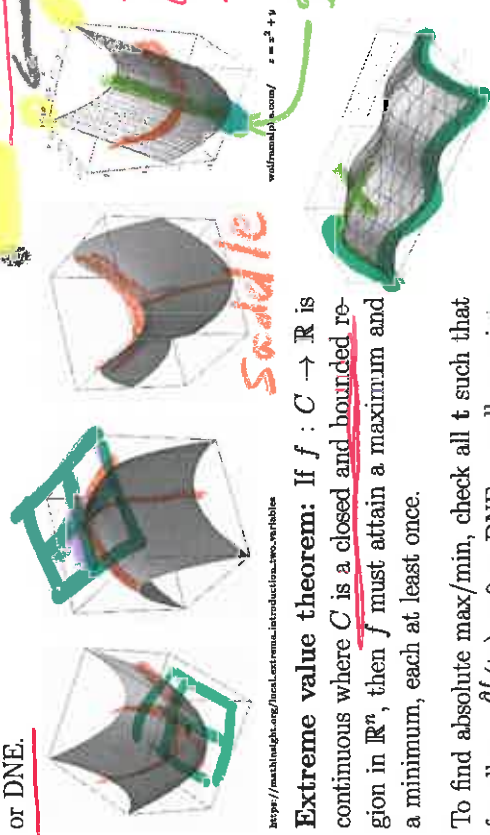


Extreme value theorem: If $f: [a, b] \rightarrow \mathbb{R}$ is continuous, then f must attain a maximum and a minimum, each at least once.

To find absolute max/min, check all t such that $f'(t) = 0$ or DNE as well as points on the boundary of $[a, b]$ (i.e., also check $f(a)$ and $f(b)$).

Section 12.5: Math 5 (multiple independent variables)

If $f(t_0)$ is a local maximum or local minimum, then for all x_i , $\frac{\partial f}{\partial x_i}(t_0) = 0$ or DNE.



Extreme value theorem: If $f: C \rightarrow \mathbb{R}$ is continuous where C is a closed and bounded region in \mathbb{R}^n , then f must attain a maximum and a minimum, each at least once.

To find absolute max/min, check all t such that for all x_i , $\frac{\partial f}{\partial x_i}(t_0) = 0$ or DNE as well as points on the boundary of C .



$f: [-1, 1] \times [-2, 2] \rightarrow \mathbb{R}$
 $f(x, y) = x^2 + y^2$

