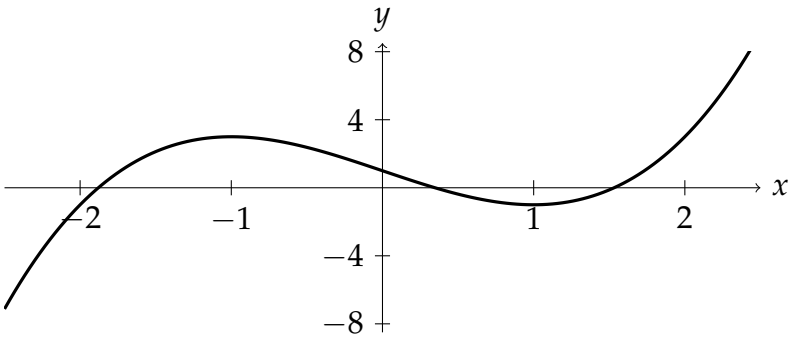
# Lecture Handout #16: Oct 25

## Critical Points and Local Minima and Maxima




$f(x) =$ $x^3 - 3x + 1$

$f'(x) =$ _____

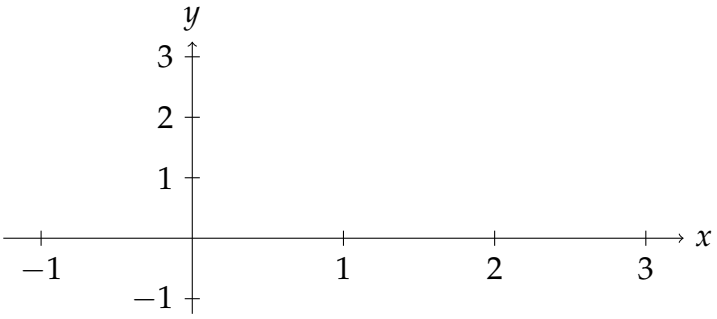
local maximum at $x =$ _____

local minimum at $x =$ _____

$f(x) =$ $x^2 - 2x$

$f'(x) =$ _____ $= 0$

critical point(s): $x =$ _____




## First Derivative Test

| L \ R | $f'(x) > 0$ ($f(x)$ increasing) | $f'(x) < 0$ ($f(x)$ decreasing) |
|---|---|---|
| $f'(x) > 0$ ($f(x)$ increasing) | | |
| $f'(x) < 0$ ($f(x)$ decreasing) | | |

| $f'$ sign | **L** | **R** |
|---|---|---|
| local max: | _____ | _____ |
| local min: | _____ | _____ |
| neither: | _____ | _____ |
| | _____ | _____ |