quiz 19
math1117.02
u new haven
fri 22 nov

name: Solution

1 (8 points). Graph the function $f(x) = 3x - x^3$. Be sure to label all intervals where f is increasing and decreasing, the intervals where f is concave up and down, and list local extrema.

Increasing/Decreasing

$f'(x) = 3 - 3x^2$

C.P. $= \pm 1$

	-1		$+1$	
	$f'(-2) < 0$	$f'(0) > 0$		$f'(2) < 0$

- increasing on $(-\infty, -1)$, $(1, \infty)$
- decreasing on $(-1, 1)$

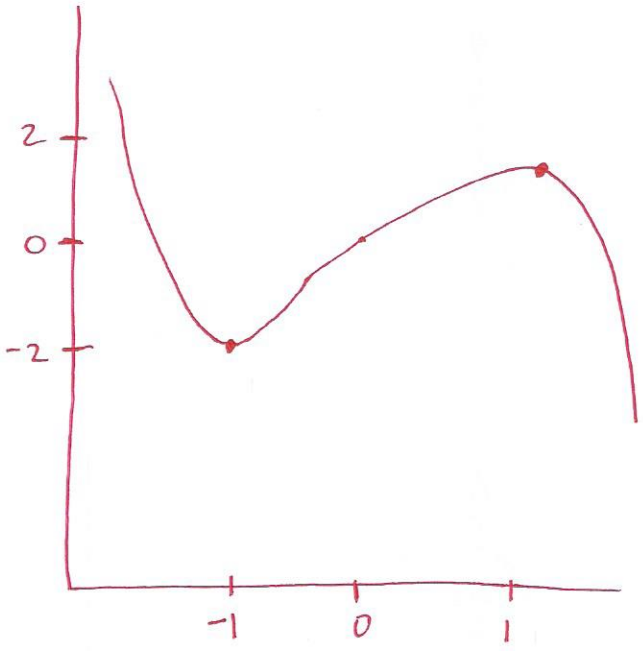
Concave Up/Down

$f''(x) = -6x$

C.P. $= 0$

	0	
	$f''(-1) > 0$	$f''(1) < 0$

- concave up $(-\infty, 0)$
- concave down $(0, \infty)$



Extrema

The critical points are $x = \pm 1$.

- $x = -1$ is a minimum b/c f is concave up
- $x = 1$ is a maximum b/c f is concave down