Math 1121 HW #8

Section 5.2 #14/18, 19/25

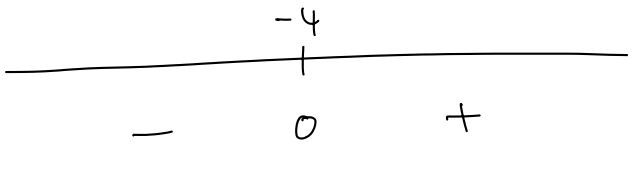
Section 5.3 #7/13, 29/35

5.2 #14/18

$f(x) = x^2 + 8x + 5$ $\quad f'=0:$ $\quad x+4=0$, $x=-4$

$f'(x) = 2x + 8$

$= 2(x+4)$



$f'(-5) = 2(-5+4) = -$

$+ \quad -$

$f'(0) = 2(0+4)$

$x = -4$ is a rel. min.

5.2 #19/25

$f(x) = x^4 - 18x^2 - 4$

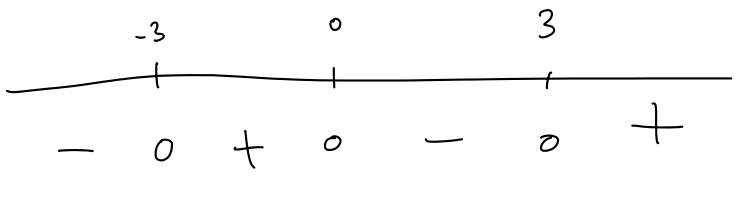
$f'(x) = 4x^3 - 36x$

$= 4x(x^2 - 9)$

$= 4x(x-3)(x+3)$

$f'=0:$ $\quad 4x=0$ $\quad x-3=0$ $\quad x+3=0$

$x=0$ $\quad x=3$ $\quad x=-3$



$f'(-4) = 4(-4)(-4-3)(-4+3)$
$+ \quad - \quad - \quad -$

$f'(-1) = 4(-1)(-1-3)(-1+3)$
$+ \quad - \quad - \quad +$

$f'(1) = 4(1)(1-3)(1+3)$
$+ \quad + \quad - \quad +$

$f'(4) = 4(4)(4-3)(4+3)$
$+ \quad + \quad + \quad +$

$x = -3$ is a rel min

$x = 0$ is a rel max

$x = 3$ is a rel min

5.3 #7/13

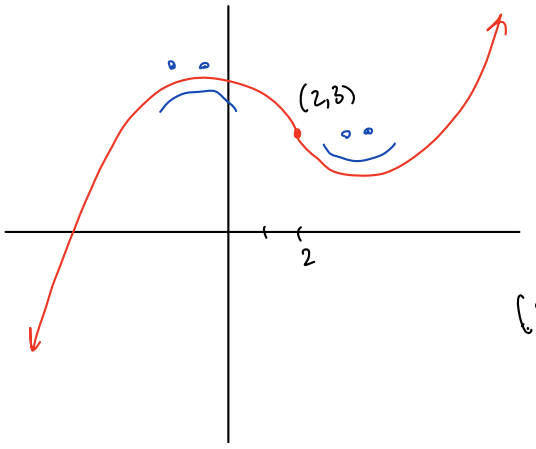
$$f(x) = \frac{x^2}{1+x}$$

$$f'(x) = \frac{(1+x)\cdot 2x - x^2\cdot(1)}{(1+x)^2} = \frac{2x+2x^2-x^2}{(1+x)^2}$$

$$f'(x) = \frac{2x+x^2}{1+2x+x^2}$$

$$f''(x) = \frac{(1+2x+x^2)\cdot(2+2x) - (2x+x^2)(2+2x)}{(1+2x+x^2)^2}$$

5.3 #29/35



conc up on $(2, \infty)$

conc. down on $(-\infty, 2)$

$(2,3)$ is an inflection pt.