Name: Key

Circle One:

11:00-11:55 (325)

3:30-4:20 (333)

Math211-2, Fall 2007
Quiz #5: 10–24–07
No Calculators. There are four problems.

1. (3 Points) Sketch the graph of $f(x) = e^x + e^{-x}$. Indicate any asymptotes, extrema points and inflection points.

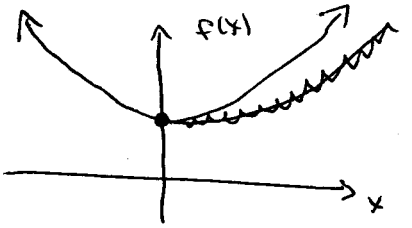
$f'(x) = e^x - e^{-x}$. Crit. pts where $e^x = e^{-x}$, or $x = -x$, $2x = 0$, $x = 0$.

$f''(x) = e^x + e^{-x} > 0$ for all x. (e^x and e^{-x} are both positive, so their sum is always positive).

x		0	
$f'(x)$	$---$	0	$+++$
$f(x)$	↘	Min	↗

$f'(1) = e^1 - e^{-1} > 0$ because $e^1 > e^{-1}$.

$f'(-1) = e^{-1} - e^1 < 0$ because ↗ (think about the graph of e^x)



$f(0) = e^0 + e^0 = 2$ is a point on the graph

x		
$f''(x)$	$+++$	
$f(x)$	∪	

2. (3 Points) Determine whether the function $f(x) = x^4 - 6x^2$ has a global maximum and/or minimum on the interval $[0, 2]$. What are these values?

Only Possible extrema are crit pts or $x=0$, $x=2$.

Crit pts when

$f'(x) = 0 = 4x^3 - 12x = 4x(x^2 - 3) = 0$.

Crit. pts when $x=0$ or $x=\sqrt{3}$ or ~~$x=-\sqrt{3}$~~.

not in domain.

$f(0) = 0$ Max

$f(\sqrt{3}) = 9 - 6\cdot 3 = 9 - 18 = -9$ Min

$f(2) = 16 - 6\cdot 4 = -8$

Max value is 0

Min value is -9.