Dawson College: **Calculus 1**: 201-NYA-05-C3: Winter 2008: Sat. April 12th

Name: SOLUTIONS
Student ID: _____

Quiz 8

This quiz is graded out of 10 marks. No books or notes are allowed. SHOW ALL YOUR WORK. If you need more space for your answer use the back of the page.

Question 1. *(5 marks)*
Find the absolute extrema of the function $f(x) = x^3 - 6x^2 - 15x - 9$ on the interval $[0, 6]$.

$f'(x) = 3x^2 - 12x - 15$
$= 3(x^2 - 4x - 5)$
$= 3(x-5)(x+1)$ critical #s $x = 5$, $x = -1$

only $x = 5$ is in the interval $[0, 6]$

$f(5) = 5^3 - 6(5)^2 - 15(5) - 9 = 125 - 150 - 75 - 9 = -109$
$f(0) = -9$
$f(6) = 6^3 - 6(6)^2 - 15(6) - 9 = -99$

THE ABSOLUTE MAX is -9 at $x = 0$
ABSOLUTE MIN is -109 at $x = 5$

Question 2. *(5 marks)*
Find and classify the relative extrema of the function $g(x) = (x^2 - 4)^{\frac{1}{3}}$.

$g'(x) = \frac{1}{3}(x^2-4)^{-2/3} \cdot 2x = \frac{2x}{3(x^2-4)^{2/3}}$

critical #s $x = 0$, $x = \pm 2$

INTERVAL	$-\infty < x < -2$	$-2 < x < 0$	$0 < x < 2$	$2 < x < \infty$
TEST	-3	-1	1	3
sign of f'	$-$	$-$	$+$	$+$
INCR. OR decr.	↘	↘	↗	↗

Relative min at $x = 0$