Quiz 2 for Mathematics 223
Introductory Analysis I - Fall 2000
Material Covered: Sections 2.3, 2.4 and 2.5 of workbook and text
For: Friday, 22nd September

This is a 15 minute quiz, worth 5% and marked out of 5 points.

Name (please print): _____ . **ID Number:** _____.
last first

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1. [2 points]
Consider the function $f(x) = -3x^2 + 2$.

(a) The quotient difference is (circle one)
$-6x^2 + h^2$ / $-6x - 3h$ / $-12x - 6h^2$ / $-6x^2 - 6xh - 3h^2$ / $-12x - 6h$

(b) The limit, $h \to 0$, of the quotient difference at $x = 2$ is (circle one)
-6 / -12 / -24 / -36 / -48 /

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2. [1 point]
A robot moves a distance s, in feet, in t seconds, according to the following equation.

$$s(t) = 3t^2 - 2t$$

The average rate of change of distance with respect to time during the period from 2 to 6 seconds is

_____

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3. [2 points]
Consider the function

$$f(x) = \frac{(x^2 - 4)(x + 3)}{x - 2}$$

(a) The limit of the function as x tends towards 2 is

$\lim_{x \to 2} \frac{x^2-4}{x-2} =$ _____

(b) **True** / **False** Since the limit at $x = 2$ exists, the function is differentiable at this point.

(Hint: Sketch the function using your calculator.)

1. [2 points]

1. $\boldsymbol{-6x-3h}$; $\frac{[-3(x+h)^2+2]-[-3x^2+2]}{h}$
2. $\boldsymbol{-12}$; $\lim_{h\to 0}(-6x-3h)=-6x$, so at $x=2$, $-6(2)=-12$

2. [1 points]
22; $\frac{(3(6)^2-2(6))-(3(2)^2-2(2))}{6-2}$

3. [2 points]

1. 20; use numerical method to show as x approaches 2, $f(x)$ approaches 20
2. **False** Since although the limit exists at $x=2$, there is a singularity ("hole") here.