

Last name:(blockletters)\_\_\_\_\_ First/Given Name:\_\_\_\_\_

Student Number:\_\_\_\_\_

**MATH 121 - TEST 1 (Based on Assignments 1, 2, and 3)**

**Version 1A Fall 2010**

*This test consists of 3 questions to be answered in the space provided.*

*Show all work and give explanations when needed.*

1. (a) One of the functions in the following table could be **linear**. Identify that function, and give a possible formula for it.  
(b) One of the functions in the following could be **exponential**. Identify that function, and give a possible formula for it.

x	-2	-1	0	1	2
$f(x)$	12	15.5	18	20	19
$g(x)$	4	6	9	13.5	20.25
$h(x)$	13	10.5	8	5.5	3

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2. (a) Use algebraic manipulations to evaluate

$$\lim_{x \rightarrow \infty} \frac{3x^3 - 2x + 1}{2x^2 - 4}$$

- (b) Find all values of  $k$  for which the limit below exists.

$$\lim_{x \rightarrow \infty} \frac{3x^k - 2x + 1}{2x^2 - 4}$$

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3. Evaluate the following derivatives. You do not need to simplify the result.

(a)  $\frac{d}{dx} (x^8 + 8 \sin(x))$

(b)  $\frac{d}{dx} (\ln(4x^2))$

(c)  $\frac{d}{dx} \arctan(x)$