Pledge:

1/20/2009	MATH261 Calculus I	Name:
Dr. Lunsford	Quiz 1	(20 Points Total)

I. Use the graph of the function f below to find the indicated function values and limits. (1 point each unless indicated, 11.5 points total)

$$f(0) = \_ f(2) = \_ f(-2) = \_$$

$$\lim_{x \to -3^{-}} f(x) = \_ \lim_{x \to -1} f(x) = \_$$

$$\lim_{x \to 2^{-}} f(x) = \_ \lim_{x \to 2^{+}} f(x) = \_$$

$$\lim_{x \to 2^{-}} f(x) = \_ \lim_{x \to 2^{+}} f(x) = \_$$

$$\lim_{x \to \infty} f(x) = \_$$
The zeros of the function are (1.5 points):

II. Harry Potter is testing the hovering ability of his new Nimbus 2000 by conducting some vertical maneuvers. His height (in metres) at time t (in seconds) is given by the function

 $h(t) = \sqrt{3t+1}$ . A graph of this function is

given below. Please answer the following questions <u>being sure to neatly show all of your work</u>. (8.5 points total)

-5

-4

-3

-2

(a) Find the average velocity (i.e. average rate of change Harry's height) from t = 1 to t = 5 seconds. Draw (and clearly indicate) the line whose slope represents this velocity on the graph. (3 points)



3

2

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-21

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4

5

f(x)

-1

(b) Draw the line on the graph whose slope represents Harry's velocity at t = 2 seconds. Clearly indicate this line on the graph. (1 point)

(c) Find an expression that gives Harry's average velocity (i.e. average rate of change) from time t = 2 seconds to time t seconds. (3 points)

(d) Complete the chart below and use it to estimate Harry's velocity (i.e. instantaneous rate of change) at t = 2 seconds. Please round all table entries to six decimal places. (1.5 points)

Time t	1.99	1.9999	2.0001	2.01
Average Velocity from $t = 2$ to time t seconds.	.567555			.566341

Harry's velocity at t = 2 seconds  $\approx$  \_\_\_\_\_ (Please round this answer to three decimal places)