Math 75B Quiz 8 (green) /20 Name: _____
Fall 2008
§§4.6 (Stewart)

Please read directions carefully. Raise your hand if you are not sure what a problem is asking. *You must explain your work thoroughly and unambiguously to receive full credit on questions or parts of questions designated as* ***Work and Answer****.*

A calculator will be necessary on this quiz!

The following formula may be useful: $\boxed{x_{n+1} = x_n - \dfrac{f(x_n)}{f'(x_n)}}$

Multiple Choice. (8 points) *Circle the letter of the best answer.*

Consider the function $f(x) = x^5 - 4x^2 + 1$, whose derivative is $f'(x) = 5x^4 - 8x$. Use the information in the table to answer the questions below.

x	$f(x)$	$f'(x)$
-3	-278	429
-2	-47	96
-1	-4	13
0	1	0
1	-2	-3
2	17	64
3	208	381

1. To use Newton's Method to approximate the **negative** root of $f(x) = x^5 - 4x^2 + 1$, it is best to use $x_1 =$

   (a) 0 (c) -2

   (b) -1 (d) -3

2. $f(x)$ has a root between 1 and 2. Using Newton's Method with $x_1 = 2$, the second approximation is $x_2 =$

   (a) $\dfrac{29}{17}$ (c) $\dfrac{111}{64}$

   (b) $\dfrac{55}{32}$ (d) $\dfrac{4}{3}$

Work and Answer. (12 points) *You must show all relevant work to receive full credit. You may use the back if you need more room.*

Using Newton's Method, compute the root of $f(x) = x^3 + x + 1$ accurate to 2 decimal places. Use the initial guess $x_1 = -\frac{3}{4}$.

If you are careful, you should not need more than four iterations to get this accuracy. You may use the table below if it is helpful.

n	x_n	$f(x_n)$	$f'(x_n)$
1	$-\dfrac{3}{4}$		
2			
3			
4			