$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$

EXCELLENT!

10/10

Quiz 10 Calculus 1 11/4/2002

Each problem is worth 5 points. Show complete justification for full credit.

5 1. Use Newton's Method with initial approximation $x_1 = -1$ to find x_2, the second approximation to the root of the equation $x^3 + x + 1 = 0$.

$f(x) = x^3 + x + 1$

$f'(x) = 3x^2 + 1$

$x_1 = -1$

$x_2 = -1 - \frac{f(-1)}{f'(-1)} \rightarrow x_2 = -1 - \frac{-1}{4}$ $x_2 = -1 + \frac{1}{4}$

$x_2 = -3/4$

5 2. Use Newton's Method with an initial approximation $x_1 = 2$ to find x_2, the second approximation to $\sqrt{3}$.

$\sqrt{3} = x$

$x^2 = 3$ $f(x) = x^2 - 3$ $x_1 = 2$

$f'(x) = 2x$ $x_2 = 2 - \frac{f(2)}{f'(2)}$

$x_2 = 2 - \frac{1}{4}$

$x_2 = 7/4$