Math 165 (Chris Kurth)
Spring 2008
Quiz 6

Show all work. Answers without work will not receive credit.

1. (10 points) Find the critical points of $f(x) = \frac{1}{2}x + \cos x$ where $0 < x < 2\pi$. Determine which are local maxima or local minima using one of the tests.

2. (10 points) Let $f(x) = \dfrac{1}{4+x^2}$ be defined on the interval $[0, \infty)$. Find the global maximum and minimum or tell me if either one does not exist.

3. (Bonus) Let $f(x) = \dfrac{1}{x} + x$. Then $f'(x) = \dfrac{-1}{x^2} + 1$, so $f'(x) = 0$ only when $x = 1$ or $x = -1$. And $f(1) = 2$ and $f(-1) = -2$. Can I conclude that the global maximum of $f(x)$ on the closed interval $[-1, 1]$ is at $x = 1$? Why or why not?