

**Math 165: Honors Calculus I**  
**Quiz 7** Oct. 26, 1995

Name: \_\_\_\_\_

1. Suppose  $\lim_{x \rightarrow p} f(x) = A$  and  $\lim_{x \rightarrow p} g(x) = B$ . Prove, using the definition of the limit, that  $\lim_{x \rightarrow p} f(x)g(x) = AB$ .

2. Assume  $f(x)$  is integrable on  $[a, b]$  and let  $F(x) = \int_a^x f(t) dt$ . Prove that  $F(x)$  is continuous at each point  $p \in [a, b]$ .

3. Calculate the following limits and explain which theorems you are using.

a)  $\lim_{x \rightarrow 0} x^2 \cos\left(\frac{1}{x^2}\right)$ .

b)  $\lim_{x \rightarrow 1} \frac{(x-1)^2}{\sin^2[3(x^2-1)]}$

c)  $\lim_{x \rightarrow 1} \frac{\sqrt{x+3}-2}{x-1}$ .