Math 166: Honors Calculus II Name:_____
Quiz 6 *Mar. 4, 1999*

1. a) Define what the notation $f(x) = o(g(x))$ as $x \to a$ means.

   b) Prove (using the definition) that $x^n o(x^m) = o(x^{n+m})$ as $x \to 0$ for any integers n, m.

   c) Prove (using the definition and part b)) that $x^2 + o(x^3) = o(x)$ as $x \to 0$.

2. Compute the limits using Taylor polynomial approximations.

a) $\lim_{x\to 0}\left(\frac{1}{x^2}-\frac{1}{\exp(x^2)-1}\right)$

b) $\lim_{x\to 0}[\cos(x)]^{a/x^2}$ [Hint: write $\cos(x)^{a/x^2}=\exp[a\log(\cos(x))/x^2]$.]