Calculus II
Exam 3, Spring 2003

Remember : You may use graphing calculators and tables of integrals, but you **MUST** show that you know your work.

1. Find the limits

a) $\lim\limits_{x \to \pi/2^+} (\tan x)(x - \pi/2)$

b) $\lim\limits_{x \to \infty} \dfrac{e^{x+2}}{e^{2x}}$

2. Does the integral converge or diverge? Give reasons. If you can, evaluate the integral.

a) $\displaystyle\int_3^\infty \frac{dx}{x(\ln x)^2}$

b) $\displaystyle\int_0^1 \frac{dx}{(x-1)^2}$

3. Does the series converge or diverge? Give reasons.

a) $\displaystyle\sum_{n=0}^\infty \frac{e^{-n}}{n^e}$

b) $\displaystyle\sum_{n=0}^\infty \frac{3n^2 - 5n + 17}{4n^3 + 25n + 1}$

c) $\displaystyle\sum_{n=0}^\infty \frac{5n}{(n^2+1)^2}$

4. What is the radius of convergence of the power series? Show your work.

a) $\displaystyle\sum_{n=0}^\infty 5^n (x-2)^n$

b) $\displaystyle\sum_{n=0}^\infty (-1)^n \frac{x^{2n+1}}{n!}$

5. Find the Maclaurin series for the function. **DO a) OR b).**

a) $\dfrac{1+x}{1-4x^2}$ b) $\displaystyle\int_0^x e^{-t^2} dt$