Georgia Tech School of Mathematics
Math 1502

Calculus II, Section D

Quiz # 2

August 31st 2009

First Name : _____

Last Name : _____

1. If $p(x) = 1 + 41x^{19}/12! - 52x^{123}/123! + 87x^{144}/144!$ give

$$p^{(123)}(0) \ =$$

2. Give the Taylor *series* of the function $\cos x$ near $x = 0$

$$\cos x \ =$$

3. Give the Taylor expansion to order 2 around $x = 0$ of

$$f(x) \ = \ \frac{1}{(1-x)^{1/5}}$$

4. (a) Give the Taylor *polynomial* up to order $2n+2$ of

$$\ln\left\{\frac{1+x}{1-x}\right\} \;=$$

(b) Admit that the remainder R_{2n+2} of the previous expansion satisfies

$$0 \;\leq\; R_{2n+2} \;\leq\; \frac{2x^{2n+3}}{(2n+3)(1-x^2)}$$

Use question 4a, with $n = 3$, to compute the number $\ln 3$ with less than 0.1% of error. *(Use $x = 1/2$ and $1/12 = .083333$, $1/80 = .01250$, $1/448 = 0.00223$, $1/(64 \times 27) \leq 0.00058$)*

$$\ln 3 \;=$$