

**QUIZ ON SECTIONS 11.6-8**

MATH 151 – SPRING 2003 – KUNIYUKI

**PART 1: GRADED OUT OF 80 POINTS; SCORE CUT IN HALF (80 → 40)****PART 2: 60 POINTS****TOTAL ON PARTS 1 AND 2: 100 POINTS****No notes, books, or calculators allowed.****(PART 1)**

Fill in the table below. You may use the back for [ungraded] scratch work.

Simplify where appropriate, but you do not have to compute factorials.

$f(x)$	First four nonzero terms of the Maclaurin series	Summation notation form for the Maclaurin series	Interval of convergence, $I$ , for the Maclaurin series
$\frac{1}{1-x}$			
$\sin x$			
$\cos x$			
$\tan^{-1} x$			
$\ln(1+x)$			
$e^x$			
$\sinh x$			
$\cosh x$			

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- 1) Find the interval of convergence for  $\sum_{n=1}^{\infty} \frac{2^n (x-4)^n}{n^2}$ . (24 points)

(You may continue on the back of this sheet.)

2) Evaluate  $\int x^2 e^{4x} dx$ . Hint: The Maclaurin series for  $e^x$  is  $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ .  
Just use series; don't use integration by parts. (10 points)

- 3) Find the first four terms of the Taylor series for  $f(x) = \sqrt{x}$  at  $c = 4$ .  
(20 points)

**TRUE/FALSE**

Circle “True” or “False” as appropriate. (6 points total; 3 points each)

- a) If  $f, f', f'', \dots$  all exist everywhere (i.e., for all values of  $x$ , say), then the Taylor series at any real number  $c$  is a valid representation for  $f$  everywhere.

True

False

- b) The Maclaurin series for  $f(x) = \cos x$  is a valid representation for  $f$  everywhere.

True

False