Calculus II, Test 2

May 16, 2003

1. Find the Taylor series about 0 for the following functions, using only the series given: $\frac{1}{1-x} = 1 + x + x^2 + ...$

a) $\tan^{-1} x$

b) $\ln(1 + x)$

2. Find the radius of convergence of the two series for the functions from the first problem. Show your result directly.

a)

b)

3. Find the first four terms of the solution to the equation

$$Y'' + Y = \frac{1}{1+x}$$

with $Y(0) = 1$, $Y'(0) = 2$, using power series.

4. Estimate $e^{\frac{3}{4}}$ to within .01, using Taylor series about zero. Show the error is less than .001.

5. Estimate $\int_0^2 \sin\left(x^2\right) dx$ to within .01 using Taylor series about zero. Show the error is less than the desired value.

6. Find the equation of the plane containing the 3 points $(1,2,3)$, $(1,1,2)$ and $1,1,1$.