MATH 142.1
FALL 1991
EXAM 2 - part 1
Prof. Girardi

Instructions:

(1) To receive credit, you must work in a logical fashion, show all your work, and when applicable put your answer in the box (or on the line) provided.
(2) During this test, do not leave your seat. Raise your hand if you have a question. When you finish, turn your exam over, put your pencil down, and raise your hand.
(3) No "formula sheets" allowed. No calculators allowed.
(4) The "Mark Box" indicates the problems along with their points. Check that your copy of the exam has all of the problems.

1. a) Find the 4th degree Taylor polynomial $P_4(x)$ and the remainder term $R_4(x)$ about the point $a = 1$ for the function $f(x) = \ln x$.

Answer: $P_4(x) =$

$R_4(x) =$ where z is between and .

b) In problem 1a), to how many decimal places of accuracy does Taylor's formula guarantee that $P_4(x)$ approximate $f(x) = \ln x$ for x between .8 and 1.2? Show your work on the back of this page.

Answer: decimal places of accuracy

2. Appoximate $\cos 47°$ within 5 decimal places of accuracy. Use Taylor's formula for an appropriate function $y = f(x)$ about an <u>appropriate</u> point a (with $a \neq 0$). Use the appropriate nth-degree Taylor polynomial $P_n(x)$ with the <u>smallest</u> n for which the Taylor Remainder guarantees that the error is within the desired accuracy.

<u>To help us give you more partial credit, fill in the 'summary boxes' below.</u>

I applied Taylor's Formula to the function $f(x) =$ about the point $a =$.

After much work I figured that I need to use the th-degree Taylor polynomial.

My appropriate Taylor Polynomial looks like:

$P\ (x) =$

Evaluating this Taylor Polynomial at the point $x =$, I obtained that

$\cos 47° \approx$

<u>Show your work here below and, if necessary, on the back of this page.</u>