MATH 1220-90 Fall 2011

Second Midterm Exam

INSTRUCTOR: H.-PING HUANG

LAST NAME _____

FIRST NAME _____

ID NO. _____

INSTRUCTION: SHOW ALL OF YOUR WORK. MAKE SURE YOUR ANSWERS ARE CLEAR AND LEGIBLE. USE **SPECIFIED** METHOD TO SOLVE THE QUESTION. IT IS NOT NECESSARY TO SIMPLIFY YOUR FINAL ANSWERS.

PROBLEM 1	20	_____
PROBLEM 2	20	_____
PROBLEM 3	20	_____
PROBLEM 4	20	_____
PROBLEM 5	20	_____
TOTAL	100	_____

PROBLEM 1

(20 pt) Find the integral

$$\int x \ln(2x)\ dx.$$

PROBLEM 2

(20 pt) Show that

$$\int_1^\infty \frac{1}{x^p}\, dx$$

diverges for $p \leq 1$ and converges for $p > 1$.

PROBLEM 3

(20 pt) Find

$$\int \sin^5 x \; dx.$$

PROBLEM 4

(20 pt) **Distinct Linear Factors** Decompose

$$\frac{1}{x^2 + x - 6}$$

and then find its indefinite integral.

PROBLEM 5

(20 pt) Find

$$\lim_{x \to 0} \frac{\sin x - x}{x^3}$$