

MATH 18.01 Problem Set 9 - Spring 2009

Due Thursday, Apr. 23 at 1:00

Part I (10 points)

Lecture 28. (*Thurs., Apr. 16*) Integration by parts.

Read: Simmons 10.7, 10.8

Work: 5F-3, 5, 6

Lecture 29. (*Fri., Apr. 17*) Improper integrals.

Read: Simmons 12.4, Notes INT

Work: 6A-3, 6B-1, 3, 7abcdfhik

No class. (*Tues., Apr. 21*) Patriot's Day.

Part II (15 points)

Problem 1. (*6 pts: 2 each*) Use integration by parts to evaluate the integrals:

a) $\int x \arctan(x - 1) dx$

c) $\int_0^1 x \ln(x) dx.$

b) $\int \sin^4 x dx$

Problem 2. (*6 pts: 3+3*)

a) Find a reduction formula for $\int x^n e^{Cx} dx.$

b) Simmons Problem 10.7.26.

Problem 3. (*3 pts*)

Describe the values of a such that $\int_{x=0}^{\infty} e^{ax} dx$ converges. Calculate the limit in the convergent cases.