18.01 FALL 2009 – Problem Set 5A

Due Friday 10/30/09, 1:45 pm in 2-106

This is part A of problem set 5. The second portion of the problem set will be available on the 18.01 website on Friday, Oct. 23.

Part I (10 points)

Lecture 16. Fri. Oct. 16 Differential equations; separating variables.
Read: 5.4, 8.5 Work: 3F-1cd, 2ae, 4bcd, 8b

Lecture 18. Thurs. Oct. 22 Definite integrals and Riemann sums.
Read: 6.3 through formula (4), 6.4, 6.5,
Work: 3B-2ab, 3b, 4a, 5, 4J-1 (just set up the integral. don't have to evaluate)

Lecture 19. Fri. Oct. 23 First fundamental theorem of calculus.
Read: 6.6, 6.7 to top of p. 215 Work: Assigned on part B of the problem set.

Part II (11 points)

Directions: Attempt to solve *each part* of each problem yourself. If you collaborate, solutions must be written up independently. Beside each problem is the date on which corresponding material in class is covered.

0. (not until due date; 3 pts) Write the names of all the people you consulted or with whom you collaborated and the resources you used, or say "none" or "no consultation". (See full explanation on PS1).

1. (Friday, 3 pts) From the supplementary notes: 3F-5abc

2. (Friday, 2 pts) Famous Investment Bank (FIB for short) begins with 676 employees. Strong government regulations on executive pay and bonuses cause FIB's workforce population P to lose employees at a rate of $-\sqrt{P}$ people per week. When will FIB no longer have any employees?

2. (Tuesday, 5 pts) Calculate

$$\int_0^1 e^x \, dx$$

using lower Riemann sums. In the course of computing this, you'll need to sum a geometric series to get a workable formula for the Riemann sum.