

18.01A Problem Set 3

(due Thurs., Oct. 11)

Due after the exam, but do the problems for classes 10-12 to help study for the exam.

Part I (25 points)

TB = Simmons; SN = 18.01A Supplementary Notes (all have solutions) The problems marked 'other' are not to be handed in.

Class 10 (Thurs., Sep. 27 **pset 2 due**) Integration by parts, numerical integration.

Read: TB: 10.7, 10.9.

Hand in: 5F/1a, 2bd, 3; 3G/1ad, 3, 4

Others: 5F/6; 3G/1b

Class 11 (Mon., Oct. 1) Improper integrals.

Read: TB: 12.4, SN: INT

Hand in: 6B/1, 2, 4, 7adfp (for p think about $x = \pi/2$), 8a.

Others: 6B/7km, 8a.

Class 12 (Tues., Oct. 2) Infinite series, harmonic series convergence tests.

Read: TB: 13.1 and 13.2 quickly, 13.3 to top p.442, 13.5 to p.453, 13.6 to p.457

Hand in: 6C/1ad, 3a; 7A/1a; 7B/1abd, 2cef.

Others: 7A/1bc; 7B/1f, 2ad.

Continuation: (Wed., Oct. 3) Discussion, review and catch up.

Exam: (Thurs., Oct. 4) **Exam 2** (covers 8-12)

Class 13 (Wed., Oct. 10) Geometric series, power series, ratio test.

Read: TB: 13.7 to middle p.463, 13.8, 14.2

Class 14 (Thurs., Oct. 11 **pset 3 due**) Introduction to probability, discrete random variables.

Read: SN: P section 1

Part II (24 points)

Directions: Try each problem alone for 20 minutes. If, after this, you collaborate, you must write up your solutions independently.

Problem 1 (Class 11, 2 pts)

Textbook 10.7/26.

Problem 2 (Class 11, 3 pts)

Let R be the region below the graph of $\frac{1}{x^p}$ and above the interval $1 \leq x < \infty$ on the x -axis. For which values of $p > 0$ is the area of R finite, but the volume of revolution of R about the y -axis infinite?

Problem 3 (Class 11, 3 pts)

Show that $\int_0^\infty \frac{1}{1+x^6} dx < \frac{6}{5}$. (Hint: break the integral into two pieces.)

Problem 4 (Part a-class 12, part b-class 13, 4 pts: 2,2)

a) Textbook p.460 9b b) Textbook p.444 4

Problem 5 (Class 14, 12 pts: 2,2,2,2,2,2)

Notes 8A/1,3,4,6,7,8