

### Review Problems (from the Textbook)

This is not an exhaustive list of all possible type of problems.  
Answers and solutions to odd exercises are in the book and Student Solutions Manual, respectively.

**Your exam preparations should include review of lecture notes, homework, and solving these review problems.** After review, use the sample exam as a test of readiness. If you can not confidently, independently and quickly solve the sample exam problems correctly, you will not do well on the exam.

Section	Problems	Section	Problems
6.1	27, 37, 39	6.2*	31, 37, 63, 73
6.3*	27, 41, 71, 87, 89	6.4*	21, 39, 47, 49
6.6	11, 19, 27, 63, 65, 67, 69	6.8	19, 33, 47, 59, 77
Chap 6 Review	All three parts except problems involving sections 6.5 and 6.7.		
7.1	5, 9, 17, 21, 27, 33, 37	7.2	5, 9, 17, 23, 27, 29
7.3	5, 7, 15, 21, 25, 29	7.4	9, 15, 23, 25, 31, 39
7.5	9, 13, 33, 51, 71	7.7	7(c), 21 ( $S_n$ & $E_s$ only)
7.8	7, 13, 21, 31, 33		
Chap 7 Review	All three parts except Exercises 51-58, 69 and problem parts involving Midpoint and Trapezoidal rules.		
8.1	9, 13, 15, 35	8.2	9, 13, 15, 17
8.3	5, 7, 11		
Chap 8 Review	Both parts except Concept Check 4-10 and Exercises 5 and 13-23.		
11.1	15, 23, 41, 47, 73, 77	11.2	17, 29, 43, 53, 57
11.3	7, 13, 17, 21, 29	11.4	7, 19, 23, 29, 31
11.5	3, 11, 17, 19, 25, 27	11.6	7, 15, 19, 27, 29, 39
11.7	3, 7, 17, 19, 27, 31	11.8	7, 11, 19, 25, 27
11.9	5, 15, 17, 25	11.10	13, 25, 27, 31, 55
11.11	5 & 7 (Don't graph), 13(a, b), 23, 27 (Don't graph)		
Chap 11 Review	All three parts corresponding to our course coverage, except Exercises 10, 57(b, d), 58(b, d) and 60(b).		
10.1	1, 9, 13, 19	10.2	7, 13, 33, 41, 61
10.3	5, 17, 25, 39, 55	10.4	9, 21, 23, 31
10.5	7, 15, 23, 27, 43		
Chap 10 Review	All three parts except problems involving section 10.6 and Exercises 19, 20, 27, 43 and 44.		

Calculus II  
Math 1220  
Sample Exam III - 4 pages  
Sections 11.1-11.11

Time Limit: 90 Minutes<sup>1</sup>   No Scratch Paper   Calculator Allowed: Not CAS capable

Name: \_\_\_\_\_

The point value of each problem is in the left-hand margin. You must show your work to receive any credit, except in problem 1. Work neatly.

(15) 1. True or False.

(     ) (a) The series  $\sum_{n=1}^{\infty} \tan^{-1} n$  converges.

(     ) (b)  $\sum_{n=1}^{\infty} 3(0.4)^{n-1} = 5$ .

(     ) (c) The MacLaurin series of  $e^x$  is  $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ .

(     ) (d) If  $\lim_{n \rightarrow \infty} a_n = 1$ , then the series  $\sum_{n=1}^{\infty} a_n$  converges.

(     ) (e) The value of Taylor series of any infinitely many times differentiable function is equal to the value of that function, at every  $x$  value in the domain.

(12) 2. Use the definition of the Taylor series to find the Taylor series expansion of  $f(x) = \sin x$  at  $a = \frac{\pi}{2}$ . You must write your answer using a summation.

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<sup>1</sup>If you exceed the time limit, you will receive a score of zero.

(27) 3. Determine convergence or divergence of the following series. State the tests used and show your work.

$$(a) \sum_{n=2}^{\infty} \left( \frac{1}{n} \times \frac{1}{\ln n} \right)$$

$$(b) \sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt[3]{n^2 + 1}}$$

$$(c) \sum_{n=1}^{\infty} \left( \frac{n^2 - n + 2}{3n^2 - 1} \right)^n$$

(4) 4. Find, with proof, both a lower bound value and an upper bound value for the sequence  $\left\{ \frac{5n}{n^2 + 1} \right\}_{n=2}^{\infty}$ .

(7) 5. Approximate the value of the convergent alternating series  $\sum_{k=1}^{\infty} \frac{(-1)^k}{4k^2 + k - 1}$  to within 0.01.

(10) 6. Find the sum of the series  $\sum_{k=1}^{\infty} \frac{1}{(2k-1)(2k+1)}$ .

(12) 7. Find the radius of convergence and the interval of convergence of the power series  $\sum_{n=1}^{\infty} \frac{(-1)^n (x-2)^n}{n^2}$ .

(8) 8. Use the MacLaurin series  $\cos x = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!} x^{2n}$  to evaluate  $\int \cos(x^2) dx$ .