

### Some Additional 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.  
 (For more problems, see your class notes, examples in the book and homework problems.)

Section	Problems	Section	Problems
1.5	9, 17, 33	1.6	9, 19, 21, 39, 43
		1.8	3, 13, 35, 45, 49(b), 53
Chap 1 Review	Concept Check: 12-19, True-False Quiz: 6-22, 24-27, Exercises 23-40, 45-52.		
2.1	3(a, b), 5, 13, 27, 33	2.2	1, 9, 23, 35, 47
2.3	25, 33, 51, 61, 69, 81	2.4	7, 9, 23, 41, 45
2.5	33, 41, 49, 51, 61	2.6	9, 15, 21, 29, 59
2.7	1(a-f), 9	2.8	9, 13, 15, 17, 25, 29, 45
2.9	3, 11, 17, 23, 27		
Chap 2 Review	All three parts, except Exercises 7-9, 12, 43, 44, 49-52, 73, 75, 76, 82, 83 and 89-92.		
3.1	39, 47, 51, 55	3.2	7, 11, 19
3.3	11, 13, 23, 35, 39, 43	3.4	15, 17, 21, 25, 55
3.5	15, 17, 25, 29, 39, 49	3.7	15, 21, 31, 35, 37
3.8	7, 11, 13, 17	3.9	15, 19, 33, 57
Chap 3 Review	All three parts, except Exercises 29-32, 48 and 61-66.		
4.1	3, 13, 21	4.2	9, 23, 37, 49, 63
4.3	11, 13, 29, 31, 33, 37	4.4	9, 11, 25, 31, 41, 57
4.5	17, 19, 25, 27, 39, 51		
Chap 4 Review	All three parts, except Exercises 31-34 and 52-58.		
5.1	9, 11, 15, 17, 35	5.2	7, 9, 11, 17, 29
5.3	5, 11, 17, 19, 37	5.4	9, 13, 17, 21, 23
5.5	5, 11(a, b), 13		
Chap 5 Review	All three parts, except Exercises 18, 29(b), 33 and 34.		

Calculus I  
Math 1210  
Sample Exam III - 5 pages  
Sections 3.7-5.1

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

Time Limit: 90 Minutes<sup>1</sup> No Scratch Paper Calculator Allowed: Scientific

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

(12) 1. True or False.

(        ) (a) The differential of  $y = x \sin x - 1$  is  $dy = x \cos x$ .

(        ) (b)  $\int_0^2 f(x) dx \leq 2$  if the continuous function  $f(x) \leq x$  for  $0 \leq x \leq 2$ .

(        ) (c)  $\int_a^b f(x) dx = f(b) - f(a)$ , for every continuous function  $f$ .

(        ) (d) The most general antiderivative of the function  $f(x) = x^2$  is  $F(x) = x^3 + c$ .

(        ) (e)  $\frac{d}{dx} \int_{-1}^x 2t dt = \frac{2}{x}$ .

(        ) (f) Suppose continuous function  $f$  has one critical point  $x = c$  on its domain with  $f'(x) < 0$  for  $x < c$  and  $f'(x) > 0$  for  $x > c$ , then  $f(c)$  is the absolute maximum value of the function  $f$ .

(8) 2. Find the solution of the equation  $x^3 - \cos x = 0$  correct to four decimal places.

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

- (12) 3. Let  $x$  and  $y$  be two positive numbers such that their product is 24. Consider the sum  $S = 3x + 2y$ . Find the values of  $x$  and  $y$  such that the sum  $S$  is as small as possible.

- (8) 4. The acceleration of a moving object at time  $t$  is given by  $a(t) = 6 - 2t$  ft/sec<sup>2</sup>. Suppose the initial velocity and position of this object are  $v(0) = 0$  ft/sec and  $s(0) = 94$  ft, respectively. Find this object's position at any time  $t$ .

(10) 5. Evaluate  $\int_0^4 (x + 1) dx$  using the (limit) definition of the integrals.

(5) 6. Evaluate  $\int_0^3 \sqrt{9 - x^2} dx$ , by considering the area of the region it represents and using the appropriate area formula.

(5) 7. Find the derivative  $\frac{d}{dx} \left( \int_0^{x^2} \sqrt{1 + t^3} dt \right)$ .

(30) 8. Evaluate the following integrals.

(a)  $\int (3\sqrt{x} - 5 \csc x \cot x) dx$

(a)  $\int \frac{t}{(t^2 + 1)^3} dt$

(b)  $\int_1^2 \left(z - \frac{1}{z}\right)^2 dz$

(c)  $\int_5^{-2} [3f(x) + 1] dx$ , if  $\int_0^5 f(x) dx = 10$  and  $\int_0^{-2} f(x) dx = -4$

8. (Continued)

(d)  $\int \cos^2 \theta \, d\theta$

(e)  $\int x \sqrt{1-x} \, dx$

(10) 9. Find the area of the region enclosed by the curves  $y = x^2$  and  $y = -x + 2$ .