

### 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 I - 4 pages  
Sections 1.4-2.6

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 in problems 1 & 2. Work neatly.

(15) 1. True or False.

- ( ) (a) The velocity of an moving object is the derivative of its position function.
- ( ) (b)  $\lim_{x \rightarrow a} f(g(x)) = f\left(\lim_{x \rightarrow a} g(x)\right)$ , if  $\lim_{x \rightarrow a} g(x)$  exists and  $f$  is continuous at that value.
- ( ) (c) A rational function is continuous everywhere except at the numbers its denominator is zero.
- ( ) (d) For all functions  $f(x)$  and numbers  $a$  in their domains, it is true that

$$\lim_{x \rightarrow a^-} f(x) = \lim_{x \rightarrow a^+} f(x).$$

- ( ) (e) For functions  $f$  is differentiable at  $x = a$ , then it is also continuous at  $x = a$ .

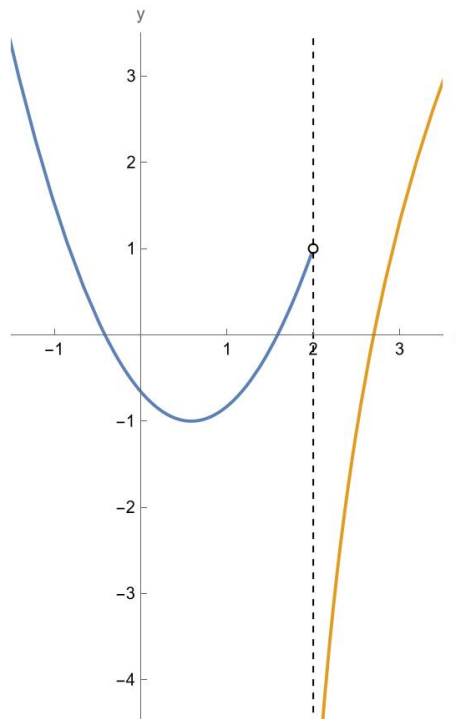
(5) 2. The graph of  $y = f(x)$  is shown below. State the value of following limits, state if it is  $-\infty$ ,  $+\infty$ , or why it does not exist. Also, state the equation of the vertical asymptote of the graph or state none exists.

(a)  $\lim_{x \rightarrow 2^-} f(x)$

(b)  $\lim_{x \rightarrow 2^+} f(x)$

(c)  $\lim_{x \rightarrow 2} f(x)$

(d) Vertical Asymptote



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

(20) 3. Evaluate each of the following limits algebraically or show it does not exist.

(a)  $\lim_{x \rightarrow -3} \frac{x + 3}{|x + 3|}$

(b)  $\lim_{x \rightarrow 1^+} \frac{x + 2}{1 - x}$

(c)  $\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x^2 - 3x + 2}$

(d)  $\lim_{x \rightarrow 0} \frac{\sqrt{x + 1} - 1}{x}$

(e)  $\lim_{x \rightarrow 0} \frac{\sin(5t)}{\tan(3t)}$

(10) 4. Use the squeeze Theorem to find  $\lim_{x \rightarrow 0} x^2 \cos(\frac{1}{x})$ .

(12) 5. Show that the function  $f(x) = x^3 - \cos x$  has a root.

(11) 6. Using the (limit) definition of the derivative, find the derivative of  $f(x) = \frac{1}{x}$  at  $x = 2$ :  $f'(2)$ .

(16) 7. Find the Indicated derivative. do not simplify your answers.

(a)  $\frac{dy}{dx}$ ,  $y = (7 \cos x - \frac{5}{x^2})(6 \sqrt[3]{x} + x^{2021})$

(b)  $f'(x)$ ,  $f(x) = \frac{\tan x - 1}{x + 1}$

(c)  $\frac{dy}{dx}$ ,  $x y^2 - 2 \sec y = x^3 + 5$

(d)  $g'(t)$ ,  $g(t) = [\sin(t^2 + 1)]^3$

(10) 8. Find the equation of the line tangent to the graph of  $f(x) = 3x^4 - 5x + 1$  at  $x = 1$ .