



Philadelphia University
Department of Basic Sciences and Mathematics
First Semester
2017 – 2018
Second Exam



Time: 50 minutes
Dec., 19, 2017

Calculus I (0250101)

الاسم: الرقم: الشعبة: المدرس:

Part One: (2 points each) Write the symbol of the most correct choice in the table below. Only the answers in the table will be graded.

1	2	3	4	5

1) $\lim_{x \rightarrow -1^-} \frac{|2x + 2|}{x^2 - x - 2} =$

- a) 1
- b) -1
- c) $-2/3$
- d) $2/3$
- e) d. n. e.

2) Given that $\lim_{x \rightarrow 3} \frac{5f(x)+10}{x-3} = 4$. Then $\lim_{x \rightarrow 3} f(x) =$

- a) 2
- b) 5
- c) -2
- d) 4
- e) -5

3) Given that $f'(5) = 4$. Then $\lim_{h \rightarrow 0} \frac{f(5+h)-f(5-3h)}{h} =$

- a) 20
- b) 16
- c) 15
- d) 12
- e) 5

4) $\frac{d}{dx}(\tan^{-1} \sqrt{x-1}) =$

a) $\frac{1}{(1+x^2)}$

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

c) $\frac{\sec^{-2} \sqrt{x-1}}{2\sqrt{x-1}}$

d) $-\frac{\tan^{-2} \sqrt{x-1} \sec^2 \sqrt{x-1}}{2\sqrt{x-1}}$

e) $\frac{1}{2x\sqrt{x-1}}$

5) If $f(3x) = \frac{d}{dx}(x^3 + 4x)$, then $f'(3) =$

a) 2

b) 3

c) 4

d) 6

e) 8

Part Two: (3 points each)

1) Find the vertical and horizontal asymptotes of the function

$$f(x) = \frac{3x^3 + 6x}{x^3 - 4x}$$

2) Find $\frac{d}{dx} f(x)$ for the following:

$$f(x) = \ln \left(\frac{x^5 \sin x}{\sqrt{x^2 + 3}} \right)$$

3) Suppose that $\cosh(x) - 9 \leq \frac{f(x)}{x-1} \leq x^2 - 8$. Use Squeeze Theorem to evaluate $\lim_{x \rightarrow 0} f(x)$

4) Let $f(x) = \begin{cases} ax^2 - bx + 1 & \text{if } x < 1 \\ 4 & \text{if } x = 1 \\ x^2 - (a + b)x + 2 & \text{if } x > 1 \end{cases}$. Find the values of a and b that make f continuous everywhere.