

University of Bahrain
Department of Mathematics
MATHS101: Calculus I
Fall 2016



Test 1

Student's Name: _____ ID:_____

Section: _____ Serial Number:_____

- *Do not* open the exam until you are instructed to do so.
- Calculators are allowed but cell phones are *not* allowed during the exam.
- Exchange of any material such as calculator, pen, eraser is *not* allowed.
- **No** questions are allowed.
- You have 1 hour to finish this exam. You can leave only after 30 minutes of the exam.
- There is 1 question consists of 17 multiple choice questions and 5 pages in this exam.
- The multiple choice question should be filled in the bubble sheet and will be graded by the computer.

Question	Points	Score
1	50	
Total:	50	

Exam Version: **B**

Question 1 (50 points)

Choose the correct answer **and** shade the answer in the answer sheet for each of the following:

(1) If

$$f(x) = \begin{cases} 3, & x \leq 3 \\ 2x - a, & x > 3 \end{cases}$$

is a continuous function, then $a =$

- | | | |
|------|-------|------|
| A. 1 | B. 2 | C. 7 |
| D. 4 | E. -1 | F. 3 |

(2) $\lim_{x \rightarrow 1} \frac{5 - 5x}{1 - x^4} =$

- | | | |
|--------------|-------------------|------------------|
| A. $-\infty$ | B. $-\frac{5}{4}$ | C. $\frac{5}{4}$ |
| D. 0 | E. ∞ | F. $\frac{4}{5}$ |

(3) $\lim_{x \rightarrow 0^-} \frac{x}{\sqrt{x^2}} =$

- | | | |
|-------|------|--------------|
| A. -1 | B. 1 | C. $-\infty$ |
| D. 2 | E. 0 | F. ∞ |

(4) Find $\lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x + 3} =$

- | | | |
|-------------|-------|------|
| A. ∞ | B. 5 | C. 0 |
| D. -1 | E. -5 | F. 1 |

$$(5) \lim_{x \rightarrow 0} \frac{x^3 - 3x^2}{x^2} =$$

(6) What is the largest interval where the function $f(x) = \sqrt{4x - 12}$ continuous?

- A. $[3, \infty)$ B. $(3, \infty)$ C. $(\infty, 3)$
D. $[12, \infty)$ E. $[-3, \infty)$ F. $(-\infty, 3]$

$$(7) \lim_{x \rightarrow 1^-} \frac{4x - 4}{x^2 - 1} =$$

(8) If

$$f(x) = \begin{cases} x^2 + 3x + 2, & x \leq 2 \\ 2x, & x > 2 \end{cases}$$

, then $\lim_{x \rightarrow 2} f(x) =$

- (9) The function $f(x) = \frac{x-1}{2x-x^2}$ is discontinuous at
- A. 0 and 2 only B. 0 only C. 1 only
D. 0, 1, and 2 only E. 2 only F. None of the above

- (10) If $\frac{x^2+x+2}{2x+2} \leq f(x) \leq \frac{x^2+4x-4}{x}$, then $\lim_{x \rightarrow 1} f(x) =$
- A. 4 B. 2 C. -3
D. -2 E. None of the above F. 1

- (11) $\lim_{x \rightarrow 3^-} \frac{x^2-9}{|x-3|} =$
- A. 4 B. 0 C. 3
D. -6 E. -3 F. Does not exist

- (12) If $\lim_{x \rightarrow 5} f(x) = 21$, then $\lim_{x \rightarrow 5} \sqrt{f(x)+4}$
- A. 5 B. 2 C. 4
D. -5 E. $\frac{1}{5}$ F. Does not exist

$$(13) \lim_{h \rightarrow 0} \frac{(h-4)^2 - 16}{h} =$$

- A. -2 B. -8 C. 8
D. 0 E. 2 F. Does not exist

$$(14) \text{ If } \lim_{x \rightarrow 3} \frac{f(x)}{x^3} = 1, \text{ then } \lim_{x \rightarrow 3} f(x) =$$

- A. $\frac{1}{27}$ B. 8 C. Does not exist
D. -27 E. $-\frac{1}{27}$ F. 27

$$(15) \lim_{x \rightarrow 0^+} \frac{x-9}{|x-9|} =$$

- A. 1 B. -1 C. 9
D. -9 E. 0 F. ∞

$$(16) \lim_{x \rightarrow 25} \frac{\sqrt{x}-5}{x-25} =$$

- A. $\frac{1}{10}$ B. $\frac{1}{8}$ C. 10
D. $-\frac{1}{10}$ E. 0 F. $\frac{1}{6}$

$$(17) \text{ If } \lim_{x \rightarrow 3} \frac{f(x)-7}{x-3} = 5, \text{ then } \lim_{x \rightarrow 3} f(x) =$$

- A. 3 B. 5 C. -7
D. -3 E. 7 F. Does not exist