Math 101 Exam I (PART 1) 063 Tuesday 17/7/2007

# EXAM COVER

Number of versions: 4 Number of questions: 7 Number of Answers: 5 per question

Math 101 Exam I (PART 1) 063

 ${\bf Tuesday~17/7/2007}$  Net Time Allowed: (For both parts) 70 minutes

## MASTER VERSION

1. 
$$\lim_{x \to -1^+} \frac{x^3 - 1}{x^2 - 1} =$$

- (a)  $\infty$
- (b)  $-\infty$
- (c)  $\frac{3}{2}$
- (d)  $\frac{1}{2}$
- (e) 0

$$2. \quad \lim_{x \to 4^+} \frac{4 - x}{\sqrt{x} - 2} =$$

- (a) -4
- (b) 4
- (c) 0
- (d)  $\infty$
- (e) does not exist

The value of the constant k' that makes 3.

$$g(x) = \begin{cases} x^3 + 2x + k + 3 & \text{if } x \le 0 \\ \sqrt{x} \sin \frac{3}{x} & \text{if } x > 0 \end{cases}$$

- (a) -3
- (b) 3
- $(c) \quad 0$
- (d) 1
- (e) -1

4. 
$$\lim_{x \to 2} \arctan\left(\frac{x^2 - 4}{2\sqrt{3}x^2 - 4\sqrt{3}x}\right) =$$

Noto	x	0	$\pi/6$	$\pi/4$	$\pi/3$
Note:	$\tan x$	0	$1/\sqrt{3}$	1	$\sqrt{3}$

- (a)  $\frac{\pi}{6}$
- (b)  $\frac{\pi}{3}$
- $(c) \quad 0$
- (d)  $\pi$
- (e) does not exist

- 5.  $\lim_{x \to -\infty} \frac{\sqrt{3x^2 + 6}}{5 2x} =$ 
  - (a)  $\frac{\sqrt{3}}{2}$
  - (b)  $-\frac{\sqrt{3}}{2}$
  - (c)  $\infty$
  - (d)  $-\infty$
  - (e) 0

- 6. The vertical and horizontal asymptotes of the graph of the function  $f(x) = \frac{x^2 9}{x^2 + 2x 3}$  are
  - (a) x = 1, y = 1
  - (b) x = 1, x = -3, y = 1
  - (c) x = -3, y = -1
  - (d) x = 1, y = -1
  - (e) x = 1, y = -3

- 7. The tangent line to the graph of a function f(x) at x = -1 is 4x+y=0. Thus the value of the limit  $\lim_{x\to -1} \frac{f(x)-f(-1)}{x+1}$  is
  - (a) -4
  - (b) 4
  - (c) 1
  - (d)  $\infty$
  - (e) 0

CODE 001

## Math 101 Exam I (PART 1) 063

CODE 001

Tuesday 17/7/2007

Net Time Allowed: (For both parts) 70 minutes

Name:			
ID:		Sec:	 

Check that this part has 7 questions.

- 1. All types of calculators, pagers or mobile phones are NOT allowed during the examination.
- 2. Use HB 2.5 pencils only.
- 3. Use a good eraser. DO NOT use the erasers attached to the pencil.
- 4. Write your name, ID number and Section number on the examination paper and in the upper left corner of the answer sheet.
- 5. When bubbling your ID number and Section number, be sure that the bubbles match with the numbers that you write.
- 6. The Test Code Number is already bubbled in your answer sheet. Make sure that it is the same as that printed on your question paper.
- 7. When bubbling, make sure that the bubbled space is fully covered.
- 8. When erasing a bubble, make sure that you do not leave any trace of penciling.

- 1. The vertical and horizontal asymptotes of the graph of the function  $f(x) = \frac{x^2 9}{x^2 + 2x 3}$  are
  - (a) x = 1, x = -3, y = 1
  - (b) x = 1, y = -3
  - (c) x = 1, y = 1
  - (d) x = 1, y = -1
  - (e) x = -3, y = -1

- $2. \quad \lim_{x \to -1^+} \frac{x^3 1}{x^2 1} =$ 
  - (a)  $\infty$
  - (b)  $\frac{1}{2}$
  - (c) 0
  - (d)  $\frac{3}{2}$
  - (e)  $-\infty$

- 3.  $\lim_{x \to 4^+} \frac{4 x}{\sqrt{x} 2} =$ 
  - (a)  $\infty$
  - $(b) \quad 0$
  - (c) -4
  - (d) does not exist
  - (e) 4

4. The value of the constant k' that makes

$$g(x) = \begin{cases} x^3 + 2x + k + 3 & \text{if } x \le 0 \\ \sqrt{x} \sin \frac{3}{x} & \text{if } x > 0 \end{cases}$$

- $(a) \quad 0$
- (b) 3
- (c) -1
- (d) -3
- (e) 1

- 5. The tangent line to the graph of a function f(x) at x = -1 is 4x+y=0. Thus the value of the limit  $\lim_{x\to -1}\frac{f(x)-f(-1)}{x+1}$  is
  - (a)  $\infty$
  - (b) -4
  - (c) 1
  - (d) 0
  - (e) 4

6.  $\lim_{x \to 2} \arctan\left(\frac{x^2 - 4}{2\sqrt{3}x^2 - 4\sqrt{3}x}\right) =$ 

Note:

x	0	$\pi/6$	$\pi/4$	$\pi/3$
$\tan x$	0	$1/\sqrt{3}$	1	$\sqrt{3}$

- (a) 0
- (b)  $\frac{\pi}{3}$
- (c) does not exist
- (d)  $\pi$
- (e)  $\frac{\pi}{6}$

7. 
$$\lim_{x \to -\infty} \frac{\sqrt{3x^2 + 6}}{5 - 2x} =$$

- (a)  $-\frac{\sqrt{3}}{2}$
- (b) 0
- (c)  $-\infty$
- $(d) \quad \frac{\sqrt{3}}{2}$
- (e)  $\infty$

Name		
ID	 Sec	

1	a	b	c	d	е	f
2	a	b	С	d	е	f
3	a	b	С	d	е	f
4	a	b	С	d	е	f
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12	a	b	С	d	е	f
13	a	b	$\mathbf{c}$	d	е	f
14	a	b	С	d	е	f
15	a	b	c	d	е	f
16	a	b	С	d	е	f
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22	a	b	С	d	е	f
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24	a	b	c	d	е	f
25	a	b	С	d	е	f
26	a	b	c	d	е	f
27	a	b	С	d	е	f
28	a	b	c	d	е	f
29	a	b	c	d	е	f
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32	a	b	c	d	е	f
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36	a	b	С	d	е	f
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49	a	b	С	d	е	f
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51	a	b	С	d	е	f
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53	a	b	С	d	е	f
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55	a	b	С	d	е	f
56	a	b	С	d	е	f
57	a	b	c	d	е	f
58	a	b	С	d	е	f
59	a	b	С	d	е	f
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61	a	b	С	d	е	f
62	a	b	С	d	е	f
63	a	b	c	d	е	f
64	a	b	С	d	е	f
65	a	b	С	d	е	f
66	a	b	С	d	е	f
67	a	b	c	d	е	f
68	a	b	С	d	е	f
69	a	b	c	d	е	f
70	a	b	c	d	е	f

CODE 002

## Math 101 Exam I (PART 1) 063

CODE 002

Tuesday 17/7/2007

Net Time Allowed: (For both parts) 70 minutes

Name:				
ID		C		
ID:		$\_$ Sec:		

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- 7. When bubbling, make sure that the bubbled space is fully covered.
- 8. When erasing a bubble, make sure that you do not leave any trace of penciling.

1. The value of the constant k' that makes

$$g(x) = \begin{cases} x^3 + 2x + k + 3 & \text{if } x \le 0 \\ \sqrt{x} \sin \frac{3}{x} & \text{if } x > 0 \end{cases}$$

- (a) 1
- (b) 0
- (c) -1
- (d) -3
- (e) 3

- $2. \qquad \lim_{x \to -1^+} \frac{x^3 1}{x^2 1} =$ 
  - (a)  $\infty$
  - (b)  $-\infty$
  - (c)  $\frac{1}{2}$
  - (d) 0
  - (e)  $\frac{3}{2}$

3. 
$$\lim_{x \to 2} \arctan\left(\frac{x^2 - 4}{2\sqrt{3}x^2 - 4\sqrt{3}x}\right) =$$

Note:

x	0	$\pi/6$	$\pi/4$	$\pi/3$
$\tan x$	0	$1/\sqrt{3}$	1	$\sqrt{3}$

- (a)  $\pi$
- (b)  $\frac{\pi}{3}$
- (c) 0
- (d)  $\frac{\pi}{6}$
- (e) does not exist

4. 
$$\lim_{x \to 4^+} \frac{4 - x}{\sqrt{x} - 2} =$$

- (a) -4
- (b) 0
- (c) 4
- (d) does not exist
- (e)  $\infty$

- 5. The tangent line to the graph of a function f(x) at x = -1 is 4x+y=0. Thus the value of the limit  $\lim_{x\to -1}\frac{f(x)-f(-1)}{x+1}$  is
  - (a)  $\infty$
  - (b) 0
  - (c) 1
  - (d) -4
  - (e) 4

- 6. The vertical and horizontal asymptotes of the graph of the function  $f(x) = \frac{x^2 9}{x^2 + 2x 3}$  are
  - (a) x = 1, x = -3, y = 1
  - (b) x = -3, y = -1
  - (c) x = 1, y = -3
  - (d) x = 1, y = -1
  - (e) x = 1, y = 1

- 7.  $\lim_{x \to -\infty} \frac{\sqrt{3x^2 + 6}}{5 2x} =$ 
  - (a)  $-\frac{\sqrt{3}}{2}$
  - (b)  $\frac{\sqrt{3}}{2}$
  - (c)  $-\infty$
  - (d)  $\infty$
  - (e) 0

Name		
ID	 Sec	

1		b	-	d		f
$\frac{1}{2}$	a	b b	$\frac{c}{c}$	d	e	f
3	a	b	$\frac{c}{c}$	d		f
$\frac{3}{4}$	a	b b	$\frac{c}{c}$	d	e	$\frac{1}{f}$
5	a	b b		d	e	f
1	a		c		е	$\frac{1}{f}$
6	a	b	С	d	е	
7	a	b	c	d	е	f
8	a	b	$\mathbf{c}$	d	е	f
9	a	b	c	d	е	f
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12	a	b	$\mathbf{c}$	d	e	f
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16	a	b	С	d	е	f
17	a	b	С	d	е	f
18	a	b	С	d	е	f
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32	a	b	c	d	е	f
33	a	b	c	d	е	f
34	a	b	c	d	е	f
35	a	b	c	d	e	f

36	a	b	С	d	е	f
37	a	b	С	d	е	f
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51	a	b	С	d	е	f
52	a	b	$^{\mathrm{c}}$	d	е	f
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61	a	b	$\mathbf{c}$	d	e	f
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63	a	b	$\mathbf{c}$	d	e	f
64	a	b	c	d	е	f
65	a	b	$^{\mathrm{c}}$	d	е	f
66	a	b	c	d	e	f
67	a	b	$\mathbf{c}$	d	е	f
68	a	b	c	d	e	f
69	a	b	$\mathbf{c}$	d	е	f
70	a	b	c	d	е	f

CODE 003

## Math 101 Exam I (PART 1) 063

CODE 003

Tuesday 17/7/2007 Net Time Allowed: (For both parts) 70 minutes

Name:		
ID:	Sec:	 

Check that this part has 7 questions.

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- 8. When erasing a bubble, make sure that you do not leave any trace of penciling.

1. 
$$\lim_{x \to 4^+} \frac{4 - x}{\sqrt{x} - 2} =$$

- (a) 4
- (b) -4
- (c) 0
- (d)  $\infty$
- (e) does not exist

- 2. The vertical and horizontal asymptotes of the graph of the function  $f(x) = \frac{x^2 9}{x^2 + 2x 3}$  are
  - (a) x = 1, y = -1
  - (b) x = 1, y = -3
  - (c) x = -3, y = -1
  - (d) x = 1, x = -3, y = 1
  - (e) x = 1, y = 1

- $3. \qquad \lim_{x \to -\infty} \frac{\sqrt{3x^2 + 6}}{5 2x} =$ 
  - (a)  $-\infty$
  - (b)  $\frac{\sqrt{3}}{2}$
  - (c)  $\infty$
  - $(d) \quad 0$
  - (e)  $-\frac{\sqrt{3}}{2}$

- 4.  $\lim_{x \to -1^+} \frac{x^3 1}{x^2 1} =$ 
  - (a) 0
  - (b)  $\infty$
  - (c)  $\frac{3}{2}$
  - (d)  $\frac{1}{2}$
  - (e)  $-\infty$

The value of the constant k' that makes 5.

$$g(x) = \begin{cases} x^3 + 2x + k + 3 & \text{if } x \le 0 \\ \sqrt{x} \sin \frac{3}{x} & \text{if } x > 0 \end{cases}$$

continuous on  $(-\infty, \infty)$  is

- (a) 0
- (b) -1
- (c) 3
- (d) 1
- (e) -3

 $\lim_{x \to 2} \arctan\left(\frac{x^2 - 4}{2\sqrt{3}x^2 - 4\sqrt{3}x}\right) =$ 

Noto	x	0	$\pi/6$	$\pi/4$	$\pi/3$
Note:	$\tan x$	0	$1/\sqrt{3}$	1	$\sqrt{3}$

- (a)  $\frac{\pi}{6}$
- (b) 0
- (c) does not exist
- (d)  $\pi$
- (e)  $\frac{\pi}{3}$

- 7. The tangent line to the graph of a function f(x) at x = -1 is 4x+y=0. Thus the value of the limit  $\lim_{x\to -1} \frac{f(x)-f(-1)}{x+1}$  is
  - (a) 0
  - (b)  $\infty$
  - (c) 4
  - (d) 1
  - (e) -4

Name		
ID	 Sec	

1	a	b	c	d	е	f
2	a	b	С	d	е	f
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22	a	b	С	d	е	f
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25	a	b	С	d	е	f
26	a	b	С	d	е	f
27	a	b	С	d	е	f
28	a	b	$\mathbf{c}$	d	e	f
29	a	b	С	d	е	f
30	a	b	$\mathbf{c}$	d	e	f
31	a	b	С	d	е	f
32	a	b	c	d	e	f
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36	a	b	С	d	е	f
37	a	b	С	d	е	f
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65	a	b	c	d	e	f
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67	a	b	c	d	е	f
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69	a	b	c	d	е	f
70	a	b	c	d	е	f

CODE 004

## Math 101 Exam I (PART 1) 063

CODE 004

Tuesday 17/7/2007

Net Time Allowed: (For both parts) 70 minutes

Name:				
ID		C		
ID:		$\_$ Sec:		

Check that this part has 7 questions.

- 1. All types of calculators, pagers or mobile phones are NOT allowed during the examination.
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- 8. When erasing a bubble, make sure that you do not leave any trace of penciling.

- 1.  $\lim_{x \to 4^+} \frac{4 x}{\sqrt{x} 2} =$ 
  - (a) 0
  - (b) does not exist
  - (c) 4
  - (d) -4
  - (e)  $\infty$

- $2. \quad \lim_{x \to -\infty} \frac{\sqrt{3x^2 + 6}}{5 2x} =$ 
  - (a) 0
  - (b)  $-\frac{\sqrt{3}}{2}$
  - (c)  $-\infty$
  - (d)  $\infty$
  - (e)  $\frac{\sqrt{3}}{2}$

3. The value of the constant k' that makes

$$g(x) = \begin{cases} x^3 + 2x + k + 3 & \text{if } x \le 0 \\ \sqrt{x} \sin \frac{3}{x} & \text{if } x > 0 \end{cases}$$

- $(a) \quad 0$
- (b) 3
- (c) -1
- (d) 1
- (e) -3

- 4. The tangent line to the graph of a function f(x) at x = -1 is 4x+y=0. Thus the value of the limit  $\lim_{x\to -1}\frac{f(x)-f(-1)}{x+1}$  is
  - (a) 1
  - (b) 4
  - (c) -4
  - (d) 0
  - (e)  $\infty$

- 5.  $\lim_{x \to -1^+} \frac{x^3 1}{x^2 1} =$ 
  - (a) 0
  - (b)  $\infty$
  - (c)  $\frac{1}{2}$
  - (d)  $\frac{3}{2}$
  - (e)  $-\infty$

- 6. The vertical and horizontal asymptotes of the graph of the function  $f(x) = \frac{x^2 9}{x^2 + 2x 3}$  are
  - (a) x = -3, y = -1
  - (b) x = 1, y = 1
  - (c) x = 1, y = -1
  - (d) x = 1, x = -3, y = 1
  - (e) x = 1, y = -3

7. 
$$\lim_{x \to 2} \arctan\left(\frac{x^2 - 4}{2\sqrt{3}x^2 - 4\sqrt{3}x}\right) =$$

Note:

x	0	$\pi/6$	$\pi/4$	$\pi/3$
$\tan x$	0	$1/\sqrt{3}$	1	$\sqrt{3}$

- (a) does not exist
- (b)  $\frac{\pi}{3}$
- (c) 0
- (d)  $\pi$
- (e)  $\frac{\pi}{6}$

Name		
ID	 Sec	

1	a	b	С	d	е	f
2	a	b	С	d	е	f
3	a	b	c	d	е	f
4	a	b	С	d	е	f
5	a	b	c	d	е	f
6	a	b	С	d	е	f
7	a	b	С	d	е	f
8	a	b	С	d	е	f
9	a	b	c	d	е	f
10	a	b	С	d	е	f
11	a	b	c	d	е	f
12	a	b	С	d	е	f
13	a	b	c	d	е	f
14	a	b	С	d	е	f
15	a	b	c	d	е	f
16	a	b	С	d	е	f
17	a	b	c	d	е	f
18	a	b	c	d	е	f
19	a	b	С	d	е	f
20	a	b	c	d	е	f
21	a	b	С	d	е	f
22	a	b	С	d	е	f
23	a	b	С	d	е	f
24	a	b	С	d	е	f
25	a	b	С	d	е	f
26	a	b	c	d	е	f
27	a	b	С	d	е	f
28	a	b	$\mathbf{c}$	d	e	f
29	a	b	c	d	е	f
30	a	b	$\mathbf{c}$	d	e	f
31	a	b	С	d	е	f
32	a	b	$\mathbf{c}$	d	е	f
33	a	b	c	d	е	f
34	a	b	$\mathbf{c}$	d	е	f
35	a	b	c	d	е	f

36	a	b	c	d	е	f
37	a	b	С	d	е	f
38	a	b	С	d	е	f
39	a	b	С	d	е	f
40	a	b	С	d	е	f
41	a	b	$\mathbf{c}$	d	е	f
42	a	b	$^{\mathrm{c}}$	d	e	f
43	a	b	$\mathbf{c}$	d	е	f
44	a	b	$\mathbf{c}$	d	e	f
45	a	b	c	d	е	f
46	a	b	$\mathbf{c}$	d	е	f
47	a	b	c	d	е	f
48	a	b	$\mathbf{c}$	d	е	f
49	a	b	c	d	е	f
50	a	b	$\mathbf{c}$	d	е	f
51	a	b	С	d	е	f
52	a	b	$\mathbf{c}$	d	е	f
53	a	b	$\mathbf{c}$	d	e	f
54	a	b	$\mathbf{c}$	d	e	f
55	a	b	$\mathbf{c}$	d	е	f
56	a	b	$\mathbf{c}$	d	e	f
57	a	b	$\mathbf{c}$	d	е	f
58	a	b	$\mathbf{c}$	d	e	f
59	a	b	$\mathbf{c}$	d	e	f
60	a	b	$\mathbf{c}$	d	e	f
61	a	b	$\mathbf{c}$	d	e	f
62	a	b	$\mathbf{c}$	d	e	f
63	a	b	$\mathbf{c}$	d	e	f
64	a	b	c	d	е	f
65	a	b	$\mathbf{c}$	d	е	f
66	a	b	c	d	е	f
67	a	b	$\mathbf{c}$	d	е	f
68	a	b	c	d	е	f
69	a	b	$\mathbf{c}$	d	е	f
70	a	b	c	d	е	f

Q	MM	V1	V2	V3	V4
1	a	С	d	b	d
2	a	a	a	е	е
3	a	С	d	b	е
4	a	d	a	b	С
5	a	b	d	е	b
6	a	е	е	a	b
7	a	d	b	е	е

## Answer Counts

V	a	b	c	d	е
1	1	2	1	1	2
2	1	2	3	0	1
3	3	0	1	1	2
4	2	4	0	0	1