

**2013-2014 AP Calculus AB Unit 1 Assessment****A calculator may NOT be used on this part of the exam. (18 minutes)**

1.  $\lim_{x \rightarrow 0} \frac{|x|}{x}$  is

- a) 0  
b) nonexistent  
c) 1  
d) -1  
e) none of these

2.  $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 + 4}$  is

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

3.  $\lim_{x \rightarrow -\infty} \frac{2^{-x}}{2^x}$  is

- a) -1  
b) 1  
c) 0  
d)  $\infty$   
e) none of these

4. Which statement is true about the curve  $y = \frac{2x^2 + 4}{2 + 7x - 4x^2}$ ?

- a) The line  $x = -\frac{1}{4}$  is a vertical asymptote.
- b) The line  $x = 1$  is a vertical asymptote.
- c) The line  $y = -\frac{1}{4}$  is a horizontal asymptote.
- d) The graph has no vertical or horizontal asymptote.
- e) The line  $y = 2$  is a horizontal asymptote.

5.  $\lim_{x \rightarrow 0} \frac{\sin 5x}{x}$

- a) = 0
- b) =  $\frac{1}{5}$
- c) = 1
- d) = 5
- e) does not exist

6.  $\lim_{x \rightarrow \infty} \frac{4 - x^2}{x^2 - 1}$  is

- a) 1
- b) 0
- c) -4
- d) -1
- e)  $\infty$

7.  $\lim_{x \rightarrow \infty} \frac{4-x^2}{4x^2-x-2}$  is

- a) -2
- b)  $-\frac{1}{4}$
- c) 1
- d) 2
- e) nonexistent

8. Let  $f(x) = \begin{cases} \frac{x^2-1}{x-1} & \text{if } x \neq 1 \\ 4 & \text{if } x = 1 \end{cases}$ . Which of the following statements is (are) true?

I.  $\lim_{x \rightarrow 1} f(x)$  exists.

II.  $f(1)$  exists.

III.  $f$  is continuous at  $x = 1$

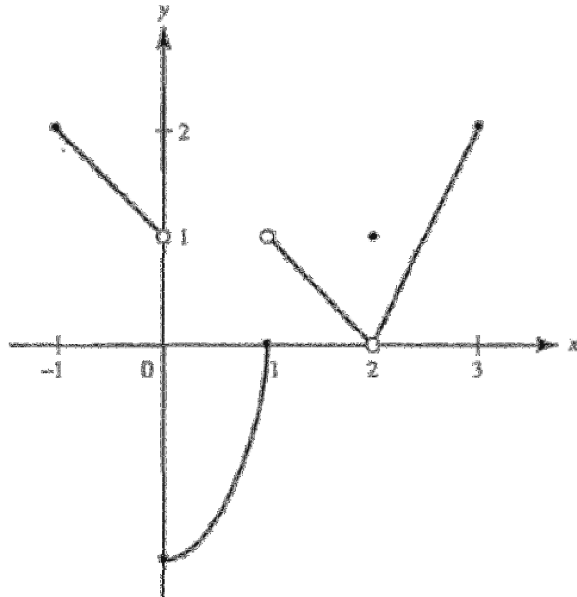
- a) I only
- b) II only
- c) I and II
- d) none of them
- e) all of them

9.  $\lim_{x \rightarrow 3} \frac{x-3}{x^2-2x-3}$  is

- a) 0
- b) 1
- c)  $\frac{1}{4}$
- d)  $\infty$
- e) none of these

A graphing calculator is **REQUIRED** for some questions on this part of the exam. (18 minutes)

10. Based on the function  $f$  shown in the graph below.



The function  $f$  has a jump discontinuity at

- a)  $x = -1$ .
- b)  $x = 1$ .
- c)  $x = 2$ .
- d)  $x = 3$ .
- e) none of these.

11. if  $y = \frac{1}{2 + 10^{\frac{1}{x}}}$ , then  $\lim_{x \rightarrow 0} y$  is

- a) 0
- b)  $\frac{1}{12}$
- c)  $\frac{1}{2}$
- d)  $\frac{1}{3}$
- e) nonexistent

12. The function  $f(x) = \begin{cases} \frac{x^2}{x} & x \neq 0 \\ 0 & x = 0 \end{cases}$

- a) is continuous everywhere.                      d) has an infinite discontinuity at  $x = 0$ .  
b) is continuous except at  $x = 0$ .                e) has  $x = 0$  as a vertical asymptote.  
c) has a removable discontinuity at  $x = 0$ .

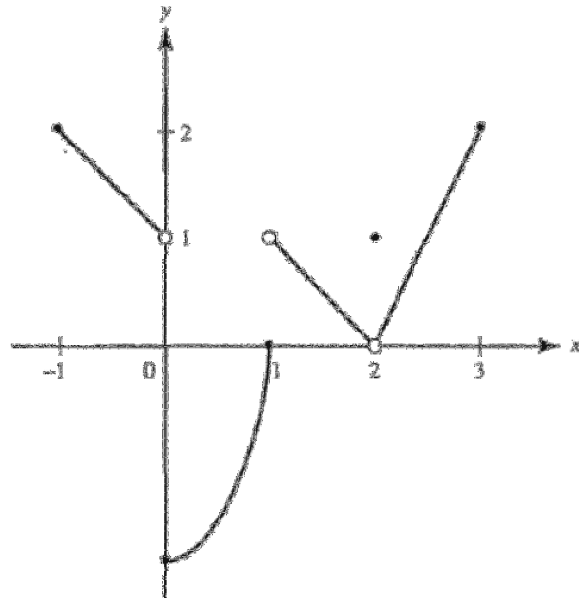
13.  $\lim_{x \rightarrow \infty} \sin x$

- a) is  $-1$ .                                              d) is zero.  
b) is infinity.                                        e) does not exist.  
c) oscillates between  $-1$  and  $1$ .

14. If  $[x]$  is the greatest integer not greater than  $x$ , then  $\lim_{x \rightarrow -2} [x]$  is

- a)  $-3$                                               d)  $0$   
b)  $-2$                                               e) none of these  
c)  $-1$

15. Based on the function  $f$  shown in the graph below.



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

- a) equals 0.
- b) equals 1.
- c) equals 2.
- d) does not exist.
- e) none of these.

**2013-2014 AP Calculus AB Unit 1 Assessment  
Answer Section**

1. ANS: B	DIF: DOK.2	STA: C 1.2
2. ANS: B	DIF: DOK.1	STA: C 1.1
3. ANS: D	DIF: DOK.2	STA: C 1.3
4. ANS: A	DIF: DOK.3	STA: C 2.0
5. ANS: D	DIF: DOK.2	STA: C 1.3
6. ANS: D	DIF: DOK.2	STA: C 1.1
7. ANS: B	DIF: DOK.2	STA: C 1.1
8. ANS: C	DIF: DOK.3	STA: C 2.0
9. ANS: C	DIF: DOK.2	STA: C 1.1
10. ANS: B	DIF: DOK.2	STA: C 2.0
11. ANS: E	DIF: DOK.2	STA: C 1.2
12. ANS: A	DIF: DOK.2	STA: C 2.0
13. ANS: E	DIF: DOK.1	STA: C 1.3
14. ANS: E	DIF: DOK.3	STA: C 1.2
15. ANS: A	DIF: DOK.2	STA: C 1.2