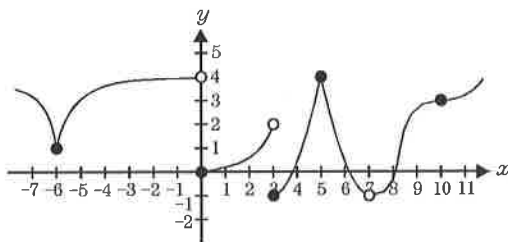Name _____   Date _____

This figure shows the graph of f. Use this figure to answer the following question(s).

1. At which of the following x-values is f continuous? Choose the BEST answer.

    I. -6

    II.   0

    III. 3

    IV. 5

    V.   7

    VI. 10

a) I, II, and IV   b) IV and VI   c) I, IV, and VI   d) II, III, and V   e) I and IV

2. At which of the following x-values does f have a removeable discontinuity? Choose the BEST answer.

    I. -6

    II.   0

    III. 3

    IV. 5

    V.   7

    VI. 10

a) I, II, and IV   b) IV and VI   c) I, IV, and VI   d) II, III, and V   e) V only

3. At which of the following x-values does f have a jump discontinuity? Choose the BEST answer.

    I. -6

    II.   0

    III. 3

    IV. 5

    V.   7

    VI. 10

a) I, II, and IV   b) II only   c) I, IV, and VI   d) II, III, and V   e) V only

4. Given a function defined by $f(x) = \dfrac{3x - 12}{x^2 - 6x + 8}$, for what value(s) of x is the function discontinuous?

a) 4 only   b) 2   c) 2, 4   d) -4 only   e) $-4, -2$

5. Which of the following functions are continuous for all real numbers x?

     I. $y = \dfrac{1}{x}$

     II. $y = 2^x$

     III. $y = \sec x$

a) I and III only   b) II only   c) II and III only   d) I and II only   e) I only

6. Given a function is defined by $f(x) = \dfrac{2x + 2}{x^2 + 5x + 4}$, for what value(s) of x does the function have one or more vertical asymptotes?

a) 1 only   b) -4 only   c) -4 and -1 d) 4 only   e) 1 and 4

7. For what value(s) of x does the function defined by $f(x) = \dfrac{x^2 - 6x + 8}{x^2 - 2x - 8}$ have a removeable discontinuity?

a) 4 only   b) 2 only   c) -4 only   d) 4 and -2 e) -4 and 2

8. Let f be defined as follows:

$$f(x) = \begin{cases} \dfrac{x^2 - 9}{x - 3} & \text{for } x \neq 3, \\ 1 & \text{for } x = 3 \end{cases}$$

Which of the following are true about f?

     I. $\lim\limits_{x \to 3} f(x)$ exists

     II. $f(3)$ exists

     III. $f(x)$ is continuous at $x = 3$

a) None   b) I only   c) II only   d) I and II only   e) I, II, and III

9. Let f be defined as follows:

$$f(x) = \begin{cases} \dfrac{x^2 - 64}{x - 8} & \text{for } x \neq 8, \\ 16 & \text{for } x = 8 \end{cases}$$

Which of the following are true about f?

     I. $\lim\limits_{x \to 8} f(x)$ exists

     II. $f(8)$ exists

     III. $f(x)$ is continuous at $x = 8$

a) None   b) I only   c) II only   d) I and II only   e) I, II, and III

10. Let f be defined as follows:

$$f(x) = \begin{cases} \dfrac{x^2 - k^2}{x - k} & \text{for } x \neq k, \\ 1 & \text{for } x = k \end{cases}$$

Which of the following are true about f?

I. $\lim\limits_{x \to k} f(x)$ exists

II. $f(k)$ exists

III. $f(x)$ is continuous at $x = k$

a) None   b) I only   c) II only   d) I and II only   e) I, II, and III

11. Let f be defined as follows:

$$f(x) = \begin{cases} \dfrac{x^2 - k^2}{x - k} & \text{for } x \neq k, \\ 2k & \text{for } x = k \end{cases}$$

Which of the following are true about f?

I. $\lim\limits_{x \to k} f(x)$ exists

II. $f(k)$ exists

III. $f(x)$ is continuous at $x = k$

a) None   b) I only   c) II only   d) I and II only   e) I, II, and III

12. Consider the function

$$f(x) = \begin{cases} x^2 & \text{for } -2 < x < 2, \\ 4 & \text{for } x \geq 2, \\ 5 & \text{for } x \leq -2 \end{cases}$$

At $x = -2$ the function has

a) a jump discontinuity   b) an infinite discontinuity

c) a removable discontinuity   d) a point at which the function is continuous

e) a point at which the function is differentiable

13. Consider the function

$$f(x) = \begin{cases} x^2 + 5 & \text{for } x > 5, \\ 3ax & \text{for } x \leq 5 \end{cases}$$

For what value of a is the function continuous?

a) 2   b) 10   c) 5   d) 15   e) 30

14. Consider $f(x) = \begin{cases} x + c & \text{for } x < 3, \\ cx^2 + 5 & \text{for } x \geq 3 \end{cases}$

For what value of the constant c is f continuous for all real numbers?

BC Calculus   Continuity   4/11/2012

Answer List

1.	c	2.	e	3.	b
4.	c	5.	b	6.	b
7.	a	8.	d	9.	e
10.	d	11.	e	12.	a
13.	a	14.	$-\frac{1}{4}$			

Catalog List

1.	APC CA 17	2.	APC CA 19	3.	APC CA 20
4.	APC CF 1	5.	APC CF 5	6.	APC CF 13
7.	APC CF 15	8.	APC CF 17	9.	APC CF 21
10.	APC CF 25	11.	APC CF 27	12.	APC CF 29
13.	APC CF 31	14.	APC CF 45			