Name: _____

# Quiz - LIMITS AND CONTINUITY

1. The graph of which of the following equations has $y = 1$ as an asymptote?

   (A) $y = \cos x$ (B) $y = e$ (C) $y =$ ——

   (D) $y =$ $\frac{}{-5}$ (E) $y = -\ln x$

2. If $\lim_{x \to a} f(x) = L$, where L is a real number, which of the following must be true?

   I. $f(a) = L$ II. $\lim_{x \to a^-} f(x) = L$ III. $\lim_{x \to a^+} f(x) = L$

   (A) I only (B) I and II (C) I and III
   (D) II and III (E) I, II, and III

3. If the graph of $y = \frac{ax+b}{x+c}$ has a horizontal asymptote $y = -2$, a vertical asymptote $x = 4$, and an $x$-intercept of 1.5, then a – b + c =

   (A) -3 (B) 1 (C) 5 (D) -9 (E) -1

4. Let $f(x) = \begin{cases} e & , -\infty < x \le 0 \\ |x-2| + k & , 0 < x < \infty \end{cases}$. Find $k$ so that f is continuous everywhere.

   (A) -1 (B) 0 (C) (D) 1 (E) $e$

5. If $f(x) = \frac{1-x}{x-2}$, then $\lim_{x \to 2^-} f(x)$, is

   (A) $-\frac{1}{2}$ (B) $\frac{1}{2}$ (C) $-\infty$ (D) $\infty$ (E) -1

6. On what interval *must* the function $g(x) = 2x^2 + 7x - 1$ intersect the line $y = 7$?

   (A) [-8, -6] (B) [-4, -1] (C) [0, 2] (D) [6, 9] (E) [4, 5]

7. $\lim_{x \to -\infty} \frac{2x+3}{\sqrt{x^2+x+1}}$ is

   (A) -2 (B) -1 (C) 0 (D) 2 (E) DNE

8. If $f$ is continuous over the set of real numbers and $f$ is defined as $f(x) = \dfrac{x^2 - 3x + 2}{x - 2}$ for all $x \neq 2$ then f(2) =

(A) -2 (B) -1 (C) 0 (D) 1 (E) 2

9. $\lim\limits_{x \to \infty} \dfrac{5x^2 + 7x - 3}{2 + 3x - 11x^2} =$

(A) $-\dfrac{3}{2}$ (B) $-\dfrac{5}{11}$ (C) 0 (D) $\dfrac{7}{3}$ (E) DNE

10. Let f be defined as $f(x) = \begin{cases} \sqrt{x} + k & , x < 1 \\ \ln(x) & , x \geq 1 \end{cases}$ for a constant, $k$.

For what value of $k$ will $\lim\limits_{x \to 1^-} f(x) = \lim\limits_{x \to 1^+} f(x)$ ?

(A) -2 (B) -1 (C) 0 (D) 1 (E) DNE

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

I. $\lim\limits_{x \to 1} f(x)$ 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