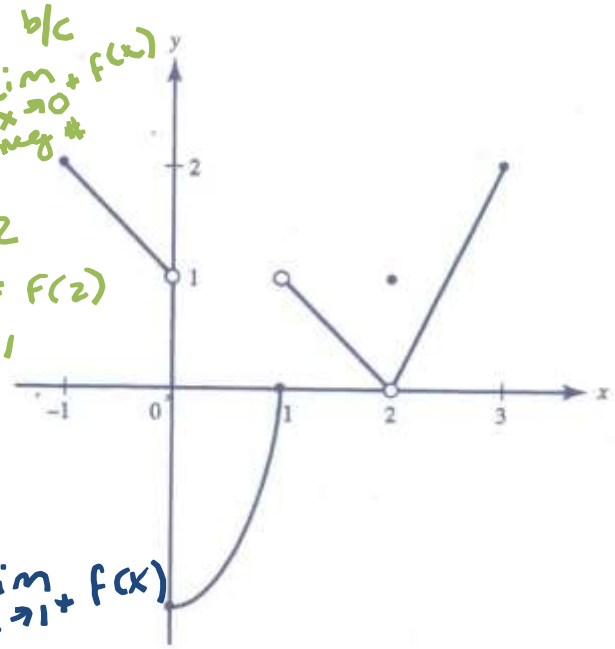
DATE: _____

Continuity (Removable & Non-Removable) – Multiple Choice

1. On which of the following intervals is f continuous?



(A) $-1 \le x \le 0$

(B) $0 < x < 1$

(C) $1 \le x \le 2$

(D) $2 \le x \le 3$

(E) none of these

2. The function f has a jump discontinuity at

(A) $x = -1$

(B) $x = 1$

(C) $x = 2$

(D) $x = 3$

(E) none of these

3. The function f has a removable discontinuity at

(A) $x = 0$

(B) $x = 1$

(C) $x = 2$

(D) $x = 3$

(E) none of these

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4. The graph of $y = \dfrac{x^2 - 9}{3x - 9}$ has

(A) a vertical asymptote at $x = 3$

(B) a horizontal asymptote at $y = \dfrac{1}{3}$

(C) a removable discontinuity at $x = 3$

(D) an infinite discontinuity at $x = 3$

(E) none of these

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

(A) is continuous everywhere

(B) is continuous except at $x = 0$

(C) has a removable discontinuity at $x = 0$

(D) has an infinite discontinuity at $x = 0$

(E) has $x = 0$ as a vertical asymptote

$f(0) = 0$

$\lim_{x \to 0} f(x) = \lim_{x \to 0} x$

$= 0$

$f(0) = \lim_{x \to 0} f(x)$ ∴, f is cont @ $x = 0$

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6. Suppose $\lim_{x \to -3^-} f(x) = -1$, $\lim_{x \to -3^+} f(x) = -1$, and $f(-3)$ is not defined.

Which of the following statements is (are) true?

TRUE I. $\lim_{x \to -3} f(x) = -1$ b/c $\lim_{x \to -3^-} f(x) = \lim_{x \to -3^+} f(x) = -1$

FALSE II. f is continuous everywhere (maybe) except at $x = -3$. only given info about $x = 3$, not enough info about rest of $f(x)$

TRUE III. f has a removable discontinuity at $x = -3$. "hole"

→ True, b/c $f(-3)$ not defined, but $\lim_{x \to -3^-} f(x) = -1$

(A) None of them

(B) I only

(C) III only

(D) I and III only

(E) All of them