231 EXAM 2

You may use your notebook during the last 15 minutes of this exam.

You may NOT use calculators, cell phones, loose papers, or peeking.

Math 231

October 15, 2013 **Name:** _____

1. Determine whether each of the following is True (T) or False (F).

T **F** Every algebraic function is continuous on its entire domain.

T **F** If f is continuous everywhere, and if $f(0) = -2$ and $f(4) = 3$, then $f(x)$ must have a root somewhere in $(0, 4)$.

T **F** If $\lim\limits_{x \to -\infty} f(x) = 3$, then the graph of f has a horizontal asymptote at $y = 3$.

T **F** If f is continuous at $x = c$, then f is differentiable at $x = c$.

T **F** If $f(c) = 10$, then $\lim\limits_{x \to c} f(x) = 10$.

T **F** Saying that $0 < |x - c|$ is the same thing as saying that $x \neq c$.

2. If $\lim\limits_{x \to 2^-} f(x) = 2$, $\lim\limits_{x \to 2^+} f(x) = 1$, and $f(2) = 1$, then f is:

A) continuous at $x = 2$ **C)** right but not left continuous at $x = 2$

B) left but not right continuous at $x = 2$ **D)** neither left or right continuous at $x = 2$

3. Find $\lim\limits_{x \to 2^+} \dfrac{1}{2 - x}$.

A) 0   **B)** ∞ **C)** $-\infty$ **D)** indeterminate

4. Find $\lim\limits_{x \to \infty} \dfrac{1}{2 - x}$.

A) 0   **B)** ∞ **C)** $-\infty$ **D)** indeterminate

5. Fill in the blanks with interval notation:

If $\lim\limits_{x \to 2^-} f(x) = 1$, then for all $\epsilon > 0$, there is some $\delta > 0$ such that

if $x \in$ _____ , then $f(x) \in$ _____ .

6. Fill in the blanks with interval notation:

If $\lim\limits_{x \to \infty} f(x) = 3$, then for all $\epsilon > 0$, there is some $N > 0$ such that

if $x \in$ _____ , then $f(x) \in$ _____ .

7. Fill in the blanks:

If $|f(x) - L| < \epsilon$, then _____ $< f(x) <$ _____ .

8. Fill in the blank with interval notation:

If $0 < |x - 2| < 0.5$, then $x \in$ _____ .

9. Calculate the limit $\lim\limits_{x \to \infty} (\sqrt{x} - x)$. Show all work.

10. Use either the $h \to 0$ or $z \to x$ definition of derivative to show that $\dfrac{d}{dx}\left(\dfrac{1}{x}\right) = -\dfrac{1}{x^2}$.

sCRAP

I will not be grading anything on this page

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