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Math 229
Mock Exam I

Disclaimer: This mock exam is for practice purposes only. It may not represent your instructor's exam. Doing well on this exam does not guarantee success on your real exam. It also doesn't guarantee failure. Use this exam to find your strengths and weaknesses and to see how long it takes to do certain problems. One of them main obstacles of any calculus exam is time management.

Good luck!

Calculus Tutoring Center
DU 326

Exam I Math 229, Calculus I, Spring 2013

Name:

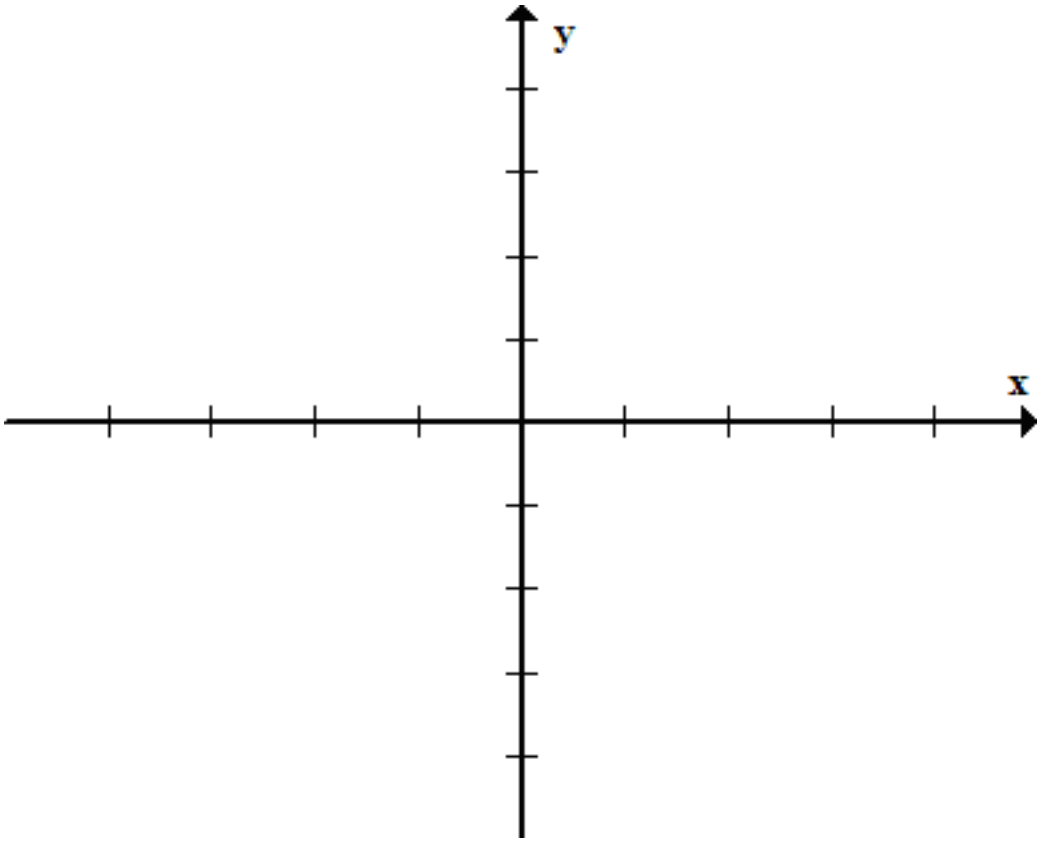
Show all work to receive full credit.

1. Sketch a graph of $f(x)$ that satisfies the following conditions:

$\lim_{x\to 2^+} f(x) = -4$ $\lim_{x\to 2^-} f(x) = 2$ $f(2) = 3$

$\lim_{x\to -3} f(x) = 1$ f is continuous at $x = -3$ $\lim_{x\to 0^+} f(x) \to \infty$

$\lim_{x\to 0^-} f(x) \to -\infty$ $\lim_{x\to 4} f(x) = 3$ f is not continuous at $x = 4$



2. Let $f(x) = \begin{cases} x^2, & x < 0 \\ \sin(x), & 0 \leq x < \pi/2 \\ x - \pi/2, & x \geq \pi/2 \end{cases}$

(a) Graph f. Your graph should be accurate with appropriate tick marks.

(b) Is f continuous at $x = 0$? Explain your answer using limit notation.

(c) Is f continuous at $x = \pi/2$? Explain your answer using limit notation.

3. Find the limits, if they exist.

(a) $\lim_{x \to 2} \dfrac{x^2 - 2x}{3x^2 - 10x + 8}$

(b) $\lim_{x \to 1} \dfrac{x\sqrt{5x - 1}}{x - 3}$

(c) $\lim_{x \to 4} \dfrac{3x - 12}{|x - 4|}$

(d) $\lim_{x \to 7^+} \dfrac{7}{7 - x}$

4. Let $f(x) = \begin{cases} \dfrac{\sqrt{x}-1}{x-1}, & x \neq 1 \\ \dfrac{1}{3}, & x = 1 \end{cases}$

Find $\lim_{x \to 1} f(x)$ and determine if $f(x)$ is continuous at $x = 1$. Show all work and you must use limit notation.

5. (a) State the Intermediate Value Theorem

(b) Use the Intermediate Value Theorem to show the equation $\sqrt{x} + x = 1$ has a solution in the interval $(0, 1)$.

6. Let $f(x) = \dfrac{3}{x-1}$.

(a) Find a formula for $f'(x)$ by using the limit definition of a derivative.

(b) Find the equation of the tangent line to $f(x) = \dfrac{3}{x-1}$ at $x = 4$