MATH 200
Calculus I

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Test 1

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February 8, 2013

Name: _____

Score: _____

Directions. Please solve the following questions in the space provided. Unless noted otherwise, you must show your work to receive full credit. This is a closed-book, closed-notes test. Calculators, computers, etc., are not to be used.

6. (15 points) Answer the questions about the function $f(x)$ graphed below.

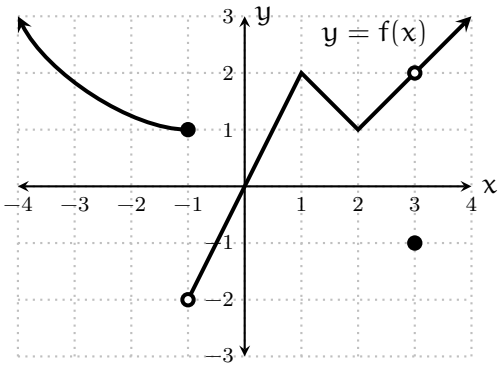
(a) $\lim_{x\to -1^+} f(x) =$

(b) $\lim_{x\to -1^-} f(x) =$

(c) $\lim_{x\to 3} \dfrac{5f(x)}{1+f(x)} =$

(d) $f \circ f(1) =$

(e) At which values c is $f(x)$ **not** continuous at $x = c$?



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1. (25 points) Warmup: short answer.

(a) $\tan(5\pi/3) =$

(c) Describe the domain of $f(x) = \dfrac{x}{1+\cos(x)}$.

(e) If $f(x) = \sec(x)\tan(x)$ and $g(x) = \dfrac{x}{\cos(x)}$, then $f \circ g(x) =$

(b) $\lim_{x\to 27} \left(1 + x^{2/3}\right) =$

(e) $\lim_{x\to 0^-} \csc(x) =$

2. (15 points) Find all solutions of the equation

$2x\sin(x) + x = 0,$ where $-\pi \leqslant x \leqslant \pi.$

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3. (15 points) Sketch the graph of any function that meets the following criteria.

(a) $f(3) = 2$

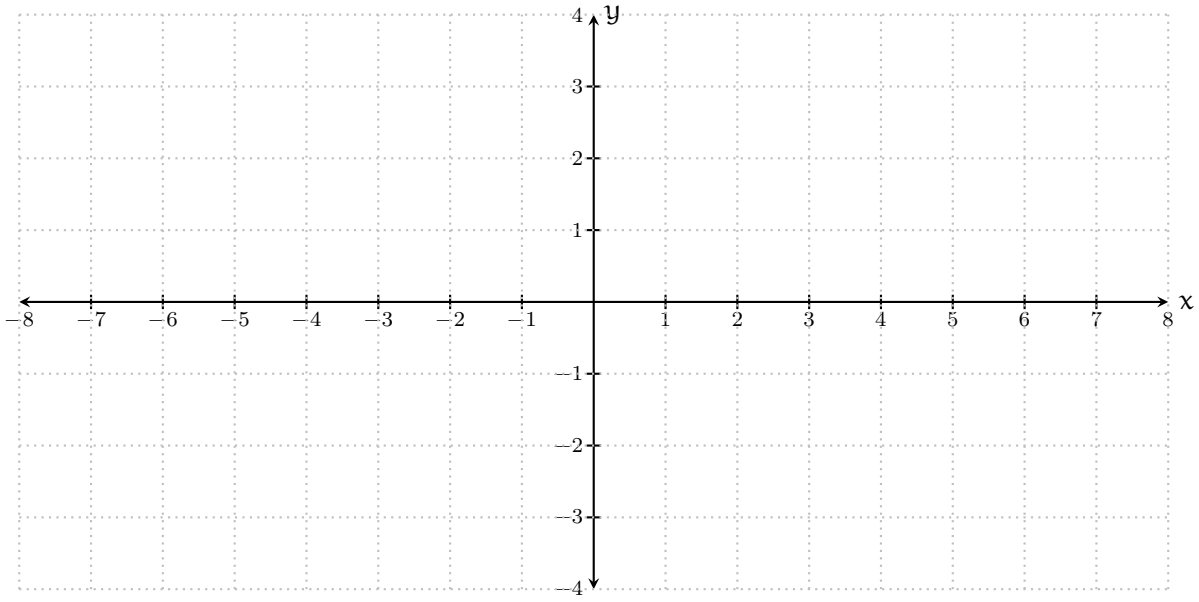
(b) Lines $y = 2$ and $y = 1$ are horizontal asymptotes.

(c) $\lim_{x \to 4} f(x) = \infty$

(d) $\lim_{x \to 1^+} f(x) = 2$

(e) $\lim_{x \to 1^-} f(x) = 1$

(f) $\lim_{x \to -1} f(x) = 3$



4. (15 points) Evaluate the following limits.

(a) $\lim_{x \to 5} \dfrac{x^2 - 3x - 10}{x^2 - 8x + 15} =$

(b) $\lim_{x \to 0} \dfrac{(x - 3)\sin(x)}{2x^2 - 6x} =$

(c) $\lim_{h \to 0} \dfrac{\sqrt{6 + h} - \sqrt{6}}{h} =$

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5. (15 points) This question concerns the function $f(x) = \dfrac{x^2 - 4}{5x^2 - 10x}$.

(a) State the intervals on which $f(x)$ is continuous.

(b) Find the horizontal asymptotes (if any).

(c) Find the vertical asymptotes (if any).