MATH 75A

Test 2

October 31, 2005

Name:

- No books, notes, or calculators are allowed.

- Please show all your work for problems 7-12.

Multiple choice questions: circle the correct answer

1. Solve for x: $2^{x-1} = \dfrac{1}{8}$

    A. -2 $\qquad$ **B.** $-\frac{4}{3}$ $\qquad$ **C.** $\frac{4}{3}$ $\qquad$ **D.** $1\frac{1}{16}$ $\qquad$ **E.** 4

2. How many horizontal asymptotes does the curve $y = \dfrac{x+2}{(x+1)(x+3)}$ have?

    A. 0 $\qquad$ **B.** 1 $\qquad$ **C.** 2 $\qquad$ **D.** 3 $\qquad$ **E.** 4

3. Evaluate $\displaystyle\lim_{x\to\infty} \dfrac{2x^2 + 7x + 3}{5x^2 - 3x + 4}$.

    A. 0 $\qquad$ **B.** $\frac{2}{5}$ $\qquad$ **C.** $\frac{3}{4}$ $\qquad$ **D.** 1 $\qquad$ **E.** Does not exist

4. Evaluate $\displaystyle\lim_{x\to-\infty} \dfrac{2x^2 + 8x - 2}{7x^3 - 2x - 4}$.

    A. 0 $\qquad$ **B.** $\frac{2}{7}$ $\qquad$ **C.** $\frac{1}{2}$ $\qquad$ **D.** 1 $\qquad$ **E.** Does not exist

5. If $f(x) = 7$, find $f'(2)$.

    A. 0 $\qquad$ **B.** 2 $\qquad$ **C.** 4 $\qquad$ **D.** 7 $\qquad$ **E.** 14

6. If $f(x) = 3x + 2$, find $f'(4)$.

    A. 0 $\qquad$ **B.** 2 $\qquad$ **C.** 3 $\qquad$ **D.** 8 $\qquad$ **E.** 14
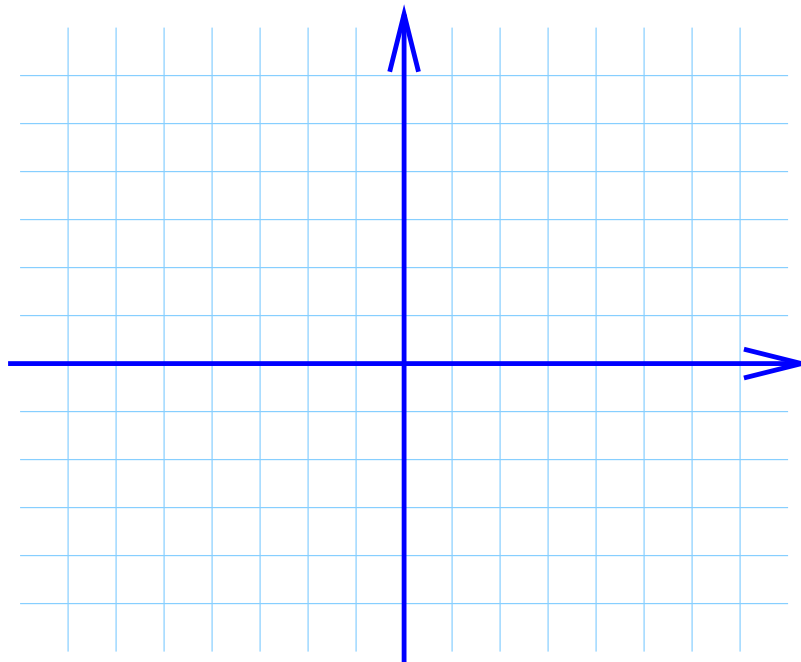
Regular problems: show all your work

7. Evaluate the limit: $\displaystyle\lim_{x\to 9}\frac{\sqrt{x}-3}{x-9}$.

8. Find the vertical asymptotes of $f(x) = \dfrac{x^3-4x}{x^2-3x+2}$.

9. Show that the equation $x^3 + 4x + 2 = 0$ has a solution in the interval $(-1, 1)$.

10. Find all values of c such that the function $f(x) = \begin{cases} cx & \text{if} & x < 4 \\ x + 6 & \text{if} & x \geq 4 \end{cases}$ is continuous everywhere.

11. (a) Sketch the graph of $f(x) = \begin{cases} x^2 - 1 & \text{if } x \leq -2 \\ x + 3 & \text{if } -2 < x \leq 1 \\ (x-2)^2 & \text{if } x > 1 \end{cases}$.

(b) At which point(s) is this function discontinuous?

(c) At the above point(s), is $f(x)$ continuous from the right, continuous from the left, or neither?

Problem	Value	Score
1	3	
2	3	
3	3	
4	3	
5	3	
6	3	
7	5	
8	5	
9	5	
10	5	
11	5	
12	7	
Total	50	

	Your scores (so far)	Out of	Grade
Homework		120	
Quizzes (lowest score dropped)		40	
Test 1		50	
Mathematica lab		10	
Test 2		50	
Total		270	