

MA 125 CALCULUS I

August 31, 2011

Name (Print last name first):

Student Signature:

TEST I

No calculators are allowed!

PART I

Part I consists of eight questions. Clearly write your answer (only) in the space provided after each question. Show all of your work for full credit!

Part 1 problems 1-4 are 6 points each, 5-8 are 7 points each.

Evaluate the following limits.

Question 1

$$\lim_{x \rightarrow 2} \frac{x^2 + 2x - 8}{x - 2}$$

Answer:

Question 2

$$\lim_{x \rightarrow 0} \frac{\sin(3x)}{\sin(7x)}$$

Answer:

Question 3

$$\lim_{x \rightarrow \infty} \frac{x + 1 + 1/x}{x^2 + 1}$$

Answer:

Question 4

$$\lim_{x \rightarrow 0^-} \frac{x}{|x|}. \text{ Note this is a left-sided limit.}$$

Answer:

Question 5

$$\lim_{x \rightarrow 2} \sec(\ln(x^2 - 3))$$

Answer:

Question 6

$$\lim_{x \rightarrow 0} \frac{1}{x^2}$$

Answer:

Question 7

$$\lim_{x \rightarrow 0} \frac{\tan(x)}{2x} =$$

Answer:

Question 8

$$\lim_{x \rightarrow \infty} \frac{x^2 + x + 1}{100x}$$

Answer:

PART II

Part II consists of 2 problems. You must show correct reasons to get full credit. Displaying only the final answer (even if correct) without the relevant steps will not get full credit.

Problem 1 (24 points)

Given the graph of the function $y = f(x)$ below find:

1. $\lim_{x \rightarrow -1^-} f(x) =$
2. $\lim_{x \rightarrow -1^+} f(x) =$
3. $\lim_{x \rightarrow -1} f(x) =$
4. $\lim_{x \rightarrow 2^-} f(x) =$
5. $\lim_{x \rightarrow 2^+} f(x) =$
6. $\lim_{x \rightarrow 2} f(x) =$
7. $\lim_{x \rightarrow \infty} f(x) =$
8. State all intervals on which $f(x)$ is continuous.

Problem 2 (24 points)

Find the equation of the tangent line, at $x = 0$, to the following functions:

1. $f(x) = x^2 + 1$

2. $g(x) = \sin(x)$