

Last Name: _____

First Name: _____

Math 1a Exam #1: Monday, October 25, 1999

SECTION (CIRCLE ONE):

Bing Cheng MWF 10 Manoj Viswanathan (CA)	Bing Cheng MWF 11 Eiichi Miyasaka (CA)	Robert Winters MWF 10 Sahir Islam (CA)	Laura DeMarco MWF 12 Brian Shaffer (CA)
Lisa Carbone TTh 10 Karen Acquista (CA) Rodolfo Perez (CA)	Lisa Carbone TTh 11:30 Peter Hamel (CA)	Grisha Mihalkin TTh 11:30 Jacob Honoroff (CA)	

The time allotted for this exam is 90 minutes.

Calculators are not permitted.

Justify your answers carefully. No partial credit can be given for unsubstantiated answers.

(1) Find the following limits, if they exist:

(a) $\lim_{x \rightarrow 2} \frac{x^2 + 3x}{x^3 + 5x + 1}$

(b) $\lim_{t \rightarrow -3} \frac{|t|}{|4t + 6|}$

(c) $\lim_{w \rightarrow -1} \frac{3 + 4w + w^2}{1 + w}$

(2) Let $h(x) = \begin{cases} 3x - 2, & x \leq 0 \\ x^2 - 2, & x > 0 \end{cases}$

(a) Sketch the graph of h .

(b) Find $\lim_{x \rightarrow 0} h(x)$ if it exists.

(c) Is h continuous? Why or why not?

(d) Is h differentiable at $x = 0$? Why or why not?

(3) a) Let $f(x) = x^2 + 2x$. What is the domain of f ?

b) Find the equation of the tangent line at $x = 2$ using the definition of the derivative.