UC Berkeley Math 10A, Fall 2014: Midterm 1

Prof. Persson, October 8, 2014

Name: _____

SID: _____

Section: Circle your discussion section below:

Sec	Time	Room	GSI
101	TuTh 8-930am	35 Evans	Noble Macfarlane
102	TuTh 8-930am	31 Evans	Kevin Donoghue
103	TuTh 11-1230pm	45 Evans	Noble Macfarlane
104	TuTh 11-1230pm	41 Evans	Kevin Donoghue
105	TuTh 1230-2pm	61 Evans	James McIvor
106	TuTh 1230-2pm	55 Evans	Adam Merberg
107	TuTh 2-330pm	61 Evans	James McIvor
108	TuTh 2-330pm	55 Evans	Shamil Shakirov
109	TuTh 330-5pm	39 Evans	Adam Merberg
110	TuTh 330-5pm	47 Evans	Markus Vasquez
111	TuTh 5-630pm	47 Evans	Markus Vasquez
112	TuTh 5-630pm	122 Latimer	Shamil Shakirov

Other/none, explain: _____

Grading

1	/ 6
2	/ 6
3	/ 5
4	/ 5
5	/ 3
6	/ 4
	/29

Instructions:

- Closed book: No notes, no books, no calculators.
- Exam time 50 minutes, do all of the problems.
- You must justify your answers for full credit.
- Write your answers in the space below each problem.
- If you need more space, use reverse side or scratch pages. Indicate clearly where to find your answers.

1. (6 points) Find each of the following limits.

a) $\displaystyle\lim_{x\to-\infty} \frac{x(3x-4)+2}{5x^2-10}$

b) $\displaystyle\lim_{x\to-3} \frac{x^2-9}{x^2+2x-3}$

c) $\displaystyle\lim_{x\to1} \frac{\frac{1}{1+x^4}-\frac{1}{2}}{x-1}$

2. (6 points) Differentiate each function.

a) $f(x) = (2x^3)^4$

b) $f(x) = \dfrac{1}{x} + x^2 e^x$

c) $f(x) = \ln\left(\arctan\sqrt{\dfrac{x}{4}}\right)$

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3. (5 points) Find the equation of the line tangent to the curve

$$\sin(4x + y) = 2x - 2y$$

at the point (π, π).

4. (5 points) Find the absolute minimum and absolute maximum of the function

$$f(x) = x^3 - 3x^2 + 1 \qquad \text{on the interval} \qquad -\frac{1}{2} \le x \le 4.$$

5. (3 points) Suppose that the point $(2, 3)$ is on the graph of $y = g(x)$, and that the equation of the line tangent to the graph of $y = g(x)$ at this point is $y = -2x + 7$. If you wanted to find a solution to $g(x) = 0$ by Newton's method and you used $x_1 = 2$ as your initial guess, what would x_2 be?

6. (4 points) Find the nth order Taylor polynomial of $f(x) = e^{2x}$ at $x = a$, where a is any real number. Write your answer using $\sum$ notation.