Math 150A – Exam 4   Your Name Here

Section 15608   23 Nov 2009

Note that the exam is printed on both sides of the paper! Read the rules on page 2 before beginning.

Student Conduct Certification

This certification must be signed or your exam will not be graded.

I certify that I have read and understand the rules of the exam, and further, that the work shown in this examination is my own and that it has been completed in accord with the California State University Northridge student conduct code. I also understand that failure to abide by the student conduct code is subject to discipline as provided in sections 41301 through 41304 of Title 5, California Code of Regulations.

Sign here: _____

Problem	Points/Total
1	/10
2	/10
3	/10
4	/10
5	/10
6	/10
7	/10
8	/10
9	/10
10	/10
Total	/100

Rules

- There are 10 problems. Complete all problems.

- <u>Clearly</u> indicate your answer to each problem (circle or underline). Ambiguous answers will be ignored.

- Show all your work.

- <u>Simplify all your answers.</u>

- You may use calculators.

- For the sketches, make sure to provide enough information to explain where everything in the picture comes from. Do not copy the picture from a graphing calculator.

- You NOT use cell phones, PDAs, computers, or any other personal computing device.

1. Find the value of x for which the slope of the curve $y = 1 + 40x^3 - 3x^5$ is the largest.

2. Find the area under the curve of $y = x(2 + \sqrt{x})$ and above the $x-$axis, on the interval $[1, 3]$. There will be a three point deduction if the answer is not exact (i.e., if it is a decimal approximation).

3. Sketch the curve $y = \dfrac{3x+5}{x-1}$, indicating the locations and values of all asymptotes and intercepts, if they exist.

4. Find the function $f(x)$ that satisfies $f''(x) = 1 - 6x + 48x^2$, $f'(1) = 16$, $f(1) = 0.5$.

5. Let $f(x) = x - 2/x$.

   (a) Write the Newton's method iteration formula for this problem.

   (b) Use Newton's method with $x_0 = 2$ to find x_1 and x_2. There will be a 3-point deduction if you answer is a decimal (calculator) approximation and not an exact fraction.

6. A wire of length 10 is cut into two pieces. One is bent into a square with sides of length a, and other is bent into a circle of radius r. Find the value of r such that (a) the area enclosed is a minimum; and (b) the area enclosed is a maximum. You do not have to solve for the values of a or the areas. Three points will be deducted if the answers are not exact.

7. Sketch the curve of $y = \dfrac{1}{3x^2 + 1}$, indicating all asymptotes (x and/or y values), local extrema (x values), and inflection points (both x and y values), if they exist.

8. Find the point (x, y) on the parabola $y^2 = 2x$ that is closest to the point $(1, 4)$.

9. Find the following integrals and simplify:

(a) $\int (x^3 - 2x + \cos x)dx$

(b) $\int \frac{x^4 + 3\sqrt{x}}{x^2}dx$

10. Find the following integrals exactly:

    (a) $\displaystyle\int_1^2 \frac{3}{t^4}\,dt$

    (b) $\displaystyle\int_{-\pi}^{\pi} (x^3 + \cos x)\,dx$