Math 1271 Calculus I
Spring 2015
Exam 3A
4/30/15
Time Limit: 50 Minutes

Name (Print): _____

Workshop Leader: _____

Section #: _____

This exam contains 7 pages (including this cover page) and 6 problems. Check to see if any pages are missing. Enter all requested information on the top of this page, and **put your initials** on the top of every page, in case the pages become separated.

You may *not* use your books, notes, or a graphing calculator on this exam.

You are required to show your work on each problem on this exam. The following rules apply:

- **Organize your work** in a reasonable, tidy, and coherent way. Work that is disorganized and jumbled that lacks clear reasoning will receive little or no credit.
- **Unsupported answers will not receive full credit.** An answer must be supported by calculations, explanation, and/or algebraic work to receive full credit. Partial credit may be given to well-argued incorrect answers as well.
- If you need more space, use the back of the pages. **Clearly indicate when you have done this.**
- **Give answers in exact form** ($\sqrt{2}$ not 1.414, π not 3.14159)

Problem	Points	Score
1	25	
2	15	
3	12	
4	15	
5	13	
6	20	
Total:	100	

Do not write in the table to the right.

1. (25 points) Evaluate the integral.

   (a) (10 points) $\displaystyle\int \frac{2\sin x}{1+\cos^2 x}\,dx$

ANSWER_____

   (b) (15 points) $\displaystyle\int_5^8 \frac{x}{\sqrt{x-4}}\,dx$

ANSWER_____

2. (15 points) Find the derivative of the function $g(x) = \int_x^{\sin x} (t^2+1)^5 \, dt$.

3. (12 points) Find an approximation to the integral $\int_{-1}^{3} x^3 + x\,dx$ using a Riemann sum with right endpoints and $n = 4$.

4. (15 points) Evaluate the integral by interpreting it in terms of areas.

$$\int_{-3}^{0} \left(\sqrt{9-x^2}+1\right) dx.$$

5. (13 points) Consider an object moving along a line with the velocity $v(t) = 3\sin \pi t$. Find the distance traveled over the time interval $0 \leq t \leq 2$.

6. (20 points) Find the area of the region enclosed by the parabola $y = 2 - x^2$ and the line $y = -x$.