Mathematics 1B. Spring Semester 2002 **Instructor: M. Ratner**

Midterm Examination #1

Your Name: _____

TA's Name: _____

Score
1.
2.
3.
4.
5.
6.

Directions: This is a *closed* book exam. No calculators.

Remember: Answers without explanations will not count. You should *sho*
necessary, use backs of the pages and extra pages attached to your exam.

Evaluate the following integrals:

1. (10 points)

$$\int x \arctan\left(\frac{1}{x}\right) dx$$

2. (10 points)

$$\int \tan^3 x \sqrt{\sec x}\, dx$$

3. (10 points)

$$\int \frac{x^2}{\sqrt{4x - x^2}}\, dx$$

4. (10 points) Evaluate

$$\int_{-1}^{\infty} \frac{dx}{x^2 + 6x + 13}$$

5. (10 points). Test for convergence.

$$\int_2^\infty \frac{\sqrt{1+2x^2}}{\sqrt{x^4+1}}\,dx$$

6. (10 points). Solve the differential equation $y' = y^2 - 4y$.