

Name: _____

Math 1312
Spring 2005
Test I

1. Evaluate the integral
 $\int x^2 \cos 4x \, dx$

2. Evaluate
 $\int \frac{x^3}{\sqrt{x^2 + 25}} \, dx$

3. Evaluate
 $\int \sec^4 x \, dx$

4. Evaluate the integral
 $\int \frac{x^3}{\sqrt{1-x^2}} \, dx$, where $|x| < 1$.

5. Solve the differential equation

$$x \frac{dy}{dx} = 3x^2y^2 - y^2, \quad y(0) = 1$$

6. Find the general solution of

$$(x^2 + 1) \frac{dy}{dx} + 3xy = 6x$$