Calculus I
Exam 3, Fall 2002

1. Integrate:

a) $\int (x^4 + 4x + 5)^3 (x^3 + 1) dx =$

b) $\int (\tan^2 x + 1) \sec^2 x dx =$

2. Solve the differential equation: $\frac{dy}{dx} = xy^2, \quad y(2) = 0.$

3. Calculate the definite integrals:

a) $\int_0^4 (x^2 - 3x + 1) dx$

b) $\int_0^{\pi/2} (\cos x \sin x) dx$

4. Find the area of the region in the first quadrant bounded by the curves $y = x(1 - x)$ and $y = 4 - 4x^2$.

5. The region in the first quadrant bounded by the curves $y = x^2$ and $x = 1$ is rotated about the y-axis. What is the volume of the solid so produced?