Math 20B First Midterm 50 points October 23, 2003

- Print Name, ID number and Section on your blue book.
- BOOKS and CALCULATORS are NOT allowed. One sheet of NOTES is allowed.
- **You must show your work to receive credit.**

1. (8 points each) Evaluate the following. For the definite integrals, write your answers as rational numbers. Remember to show your work!

   (a) $\int xe^{2x}\,dx.$

   (b) $\int_0^4 \frac{x}{\sqrt{9+x^2}}\,dx.$

   (c) $\int \frac{1}{e^x+1}\,dx$

   (d) $\int_{-1}^{1} \sin(t^3)\,dt.$ *Hint*: This is very simple when looked at the right way.

   (e) $g'(x)$ where $g(x) = \int_{x^2}^{2003} \sin(t^3)\,dt.$

2. Express the following as integrals. **DO NOT EVALUATE** the integals. Sketches may be useful in obtaining partial credit if you make a mistake.

   (a) (3 points) The average of the positive values of $f(x) = 9 - x^2$; that is, the average over those x for which $f(x) \geq 0$.

   (b) (7 points) The volume of the solid obtained by rotating the region that lies below $y = x$ and above $y = x^2$ about the y-axis.

END OF EXAM