Math 142 (Section 501) **Quiz 1** **January 14, 2005**

Name _____

- **No calculators are allowed.**

1. (5 points) Evaluate the following indefinite integrals.

   (a) $\int dx$

   (b) $\int x^r \, dx$ $\qquad (r \neq -1)$

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

   (d) $\int \cos x \, dx$

   (e) $\int \sin x \, dx$

   (f) $\int \sec^2 x \, dx$

   (g) $\int \csc^2 x \, dx$

   (h) $\int \sec x \tan x \, dx$

   (i) $\int \csc x \cot x \, dx$

   (j) $\int e^x \, dx$

   (k) $\int b^x \, dx$ $\qquad (0 < b, b \neq 1)$

   (l) $\int \frac{1}{1+x^2} \, dx$

   (m) $\int \frac{1}{\sqrt{1-x^2}} \, dx$

   (n) $\int \frac{1}{x\sqrt{x^2-1}} \, dx$

2. (3 points) Evaluate the following integrals.

   (a) $\int \left(6x^2 + \sqrt{x} + \frac{3}{x} + 7\right)\, dx.$

   (b) $\int \cos^3(x)\sin(x)\, dx.$

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

3. (2 points) Sketch the graph of $f(x) = 2 + \sin x$ on the interval $[0, \pi]$ and shade in the area between the x-axis and this curve on that interval. Now compute the exact area of this shaded region.