Name:_____

Student Number:_____

Exam I, Caluclus II, Fall 2002

Show all your work and give reasons for your answers. Good luck!

(1) Evaluate the following integrals

(a) $\int x^3\sqrt{x^4+3}\,dx$

(b) $\int \frac{x^6+x^4-x^2-1}{x^3}\,dx$

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

(d) $\int \sin^4(x)\cos^3(x)\,dx$

(e) $\int (x_1)^2 e^x \, dx$

(f) $\int \frac{x}{x^3+1} \, dx$

(g) $\int \sqrt{x^2 - 4x - 10} \, dx$

(2) Set up an integral for the length of the graph of $y = \cos(x)$ between $x = 0$ and $x = \pi$.

(3) Set up integrals for the volume of the solid of revolution obtained by rotating the area bounded by the x-axis and the graph of $y = \sin(x)$ between $x = 0$ and $x = 4\pi$ about:

(a) the line $y = -4$

(b) the line $x = -4$

(4) Show, using calculus, that the volume of a right cone of height h whose base is a round circle of radius r is $V = \frac{1}{3}\pi r^2 h$.