Math 128, Fall 2007
Quiz 5, Section D Name: _____

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. Evaluate:

$$\int_0^{\pi} (x+1)\cos(x)dx$$

Integrating by parts with $u = (x+1)$ $dv = \cos(x)dx$ and $du = dx$ $v = \sin(x)$ we get

$$\int (x+1)\cos(x)dx = (x+1)\sin(x) - \int \sin(x)dx = (x+1)\sin(x) + \cos(x) + C$$

Evaluating,

$$\int_0^{\pi} (x+1)\cos(x)dx = [(x+1)\sin(x) + \cos(x)]_0^{\pi} = -1 - (1) = -2$$

2. Use the Midpoint rule with $n = 3$ subintervals to approximate the integral

$$\int_{-1.5}^{1.5} e^{-x^2}dx$$

Let $f(x) = e^{-x^2}$. Since $n = 3$, $\Delta x = 1$. Then,

$$\int_{-1.5}^{1.5} e^{-x^2}dx \approx \Delta x(f(-1) + f(0) + f(1)) = 1(e^{-1} + e^0 + e^{-1}) = 1 + 2e^{-1}$$