

邊界元素法1999 作業四

1. Transform the ODE to integral equation.

ODE

$$u''(x) + 4u(x) = 0$$

subjected to

$$u(0) = u_0, u'(0) = v_0$$

IE

$$u(x) = \int_0^x K(x, s)u(s)ds + g(x)$$

Please determine $K(x, s)$ and $g(x)$.

Integral identity (n-fold integral $\rightarrow$ single integral) :

$$\int_a^x \int_a^{x_n} \cdots \int_a^{x_3} \int_a^{x_2} f(x_1) dx_1 dx_2 \cdots dx_{n-1} dx_n = \frac{1}{(n-1)!} \int_a^x (x-s)^{n-1} f(s) ds$$