

Homework #3, Winter 1999
MEAM 501 Differential Equation Methods in Mechanics

Consider a second order differential equation

$$-\frac{d}{dx}\left(\sin(4\pi x)\frac{du}{dx}\right)+0.1\cos(3\pi x)u=1+e^{-x(1-x)} \quad \text{in } (0,1)$$

with the boundary condition

$$u(0)=-u(1)=0.1$$

- (1) Solve this problem by the element free Galerkin method which reproduce a linear polynomial.
- (2) Solve this problem by the wavelet Galerkin method with any appropriate wavelet function.
- (3) Solve this problem by the standard finite element or finite difference method, and make comparison with the element free and wavelet Galerkin methods.