1. Find an approximate solution for the BVP using weighted integrals with an approximate solution of the form u(x) =c1x2+c2x+c3 and a weight function w(x) = 1.

syms c1 c2 c3

syms x

u = @(x) c1\*x\*x+c2\*x+c3;

w1 = @(x) 1;

w2 = @(x) x;

R = @(x) diff(u(x),2) + u(x);

u0 = u(0) == 1;

u1 = u(1) == 0;

A1 = int(R(x)\*w1(x), 0, 1) == 1;

A2 = int(R(x)\*w2(x), 0, 1) == 1;

eqs = [subs(A1, c3, 1), ...

subs(A2, c3, 1)];

A = solve (eqs, [c1 c2]);

C1 = A.c1;

C2 = A.c2;

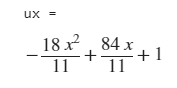
C3 = 1;

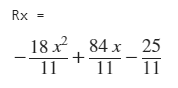
u = @(x) C1\*x\*x+C2\*x+C3;

R = @(x) diff(u(x),2) + u(x);

ux = u(x);

Rx = R(x);





2. Find an approximate solution for the BVP using weighted integrals with an approximate solution of the form u(x) =c1x3+c2x2+c3x+c4 and weight function sw1(x) = 1 and w2(x) =x.

syms c1 c2 c3 c4

syms x

u = @(x) c1\*x^3+c2\*x^2+c3\*x+c4;

w1 = @(x) 1;

w2 = @(x) x;

R = @(x) diff(diff(u(x))\*x) + u(x);

u0 = u(0) == 1;

ux = diff(u(x))\*x == 0;

ux1 = subs (ux, x, 1);

A1 = int(R(x)\*w1(x), 0, 1) == 0;

A2 = int(R(x)\*w2(x), 0, 1) == 0;

eqs = [subs(A1, c4, 1), ...

subs(A2, c4, 1)];

A = solve ([eqs ux1], [c1 c2 c3]);

C1 = A.c1;

C2 = A.c2;

C3 = A.c3;

C4 = 1;

u = @(x) C1\*x^3+C2\*x^2+C3\*x+C4;

R = @(x) diff(diff(u(x))\*x) + u(x);

ux = u(x);

Rx = R(x);

