In[229]:=

```
c1 := 1;  c2 := 1; c3 := 1;  c4 := 1;  c5 := 1; c6 := 1; c7 := 1;
c8 := 1;
c9 := 1;
c10 := 1;
c11 := 1;
c12 := 1;
c13 := 1;
c14 := 1;
c15 := 1;
c16 := 1;



m = 10;
length = 1;
deltax = (length) / m;   (*Intervals In X Dir.*)
nn = m + 1;
eq1[i_] := 2 * c1 * f1[i - 1] + 2 * c1 * f1[i + 1] - (deltax) * c2 * f2[i - 1] + (deltax) * c2 * f2[i + 1] -
    (deltax) * c3 * f3[i - 1] + (deltax) * c3 * f3[i + 1] + (2 * (deltax^2) * c4 - 4 * c1) * f1[i];
eq2[i_] := - (deltax) * c7 * f1[i - 1] + (deltax) * c7 * f1[i + 1] +
    2 * (c5 * f2[i - 1] + c5 * f2[i + 1] + (deltax^2) * c8 * f3[i] +
       ((deltax^2) * (c6 + c9 * (omega)^2) - 2 c5) * f2[i]);
eq3[i_] := -2 * c10 * f3[i - 2] + 2 * c10 * f3[i + 2] - (deltax^3) * c12 * f1[i - 1] + (deltax^3) * c12 * f1[i + 1] +
    2 * (deltax^4) * c13 * f2[i] + (2 * (deltax^2) * c11 + 2 * (deltax^2) * c15 * (omega)^2 - 8 * c10) * f3[i - 1] +
    (2 * (deltax^2) * c11 + 2 * (deltax^2) * c15 * (omega)^2 - 8 * c10) * f3[i + 1] +
    (12 * c10 - 4 * (deltax^2) * c11 + 2 * (deltax^4) * c14 - 4 * c15 * (deltax^2) * (omega)^2 +
       2 * c16 * (deltax^4) * (omega)^2) * f3[i];
BC = {f1[1] → 0, f1[nn] → 0, f2[nn] → 0, f2[1] → 0, f3[nn + 1] → f3[m], f3[0] → f3[2], f3[1] → 0,
    f3[nn] → 0};
cA = Flatten[Table[{f1[j], f2[j], f3[j]}, {j, 2, m}]];
r1 = Table[Coefficient[(Simplify[eq1[j] /. BC]), cA], {j, 2, m}];
r2 = Table[Coefficient[Simplify[(eq2[j] /. BC)], cA], {j, 2, m}];
r3 = Table[Coefficient[Simplify[(eq3[j] /. BC)], cA], {j, 2, m}];
A = Join[r1, r2, r3];
MatrixForm[A /. {omega → ω}];
roots = DeleteCases[ω /. NSolve[Det[A /. {omega → ω}] == 0, ω, Reals], _?Negative];
ω1 = Min[roots];
Print[Style[StringJoin["* Fundamental Frequency of the System for ", ToString[m], " Mesh is  "],
  FontFamily → "Cambria", FontSize → 13, Bold, Darker[Red]],
 Style[ω1, Darker[Green], Bold, FontFamily → "Times New Roman"], " rad/sec"]
Print[Style[StringJoin["* Other Frequencies for ", ToString[m], " Mesh is  "],
  FontFamily → "Cambria", FontSize → 13, Bold, Darker[Red]],
 Style[Grid[{roots}, Frame → All], Darker[Green], Bold], " rad/sec"]
```