

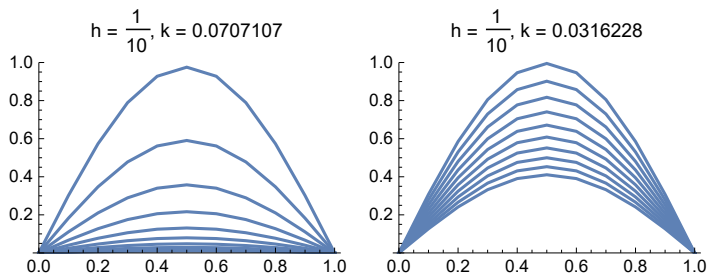
```
In[89]:= (* MA39110 / Assignment 11 / 16MA20053 / NER ROHIT *)
```

```
ClearAll["Global`*"];
```

```
In[90]:= cnt = 0; max = 0;
```

```
Model[n0_, r0_] := Module[{n = n0, r = r0},
  x0 = 0; xf = 1; h = (xf - x0) / n;
  X = Table[x0 + x * h, {x, 1, n - 1}];
  XT = Table[x0 + x * h, {x, 0, n}];
  f[x_] = Sin[Pi * x];
  U = Table[f[XT[[x]]], {x, 1, n + 1}];
  UT = U;
  UTT = UT;
  PLT = Table[0, {x, 1, 100}];
  For[j = 1, j ≤ 100, j++, {
    U = UT;
    For[i = 1, i < n, i++, {
      {
        im = i + 1;
        If[j ≠ 1, UT[[im]] = r * U[[im - 1]] + 2 (1 - r) U[[im]] + r * U[[im + 1]] - UTT[[im]],
        UT[[im]] = (1/2) (r * U[[im - 1]] + 2 (1 - r) U[[im]] + r * U[[im + 1]])];
      }];
    UTT = UT;
    PLT[[j]] = ListLinePlot[Transpose[{XT, UT}], PlotRange → {0, 1}];
  }];
  Show[{PLT[[1 ;; ;; 10]]},
    PlotLabel → Style[StringForm["h = `", k = `", h, h * Sqrt[r]], FontSize → 10]]
];
```

```
In[92]:= GraphicsGrid[{{Model[10, 0.5], Model[10, 0.1]}, {Model[20, 0.5], Model[20, 0.1]}}]
```



```
Out[92]=
```

