In[1]:=
```
(*MA39110 / Assignment 1 / 16MA20053 / NER ROHIT *)
ClearAll["Global`*"];
```

In[2]:=
```
x0 = 1; xf = 1.4; n = 40; h = (xf - x0) / n
y0 = 0; yf = 0.0566;
A = Table[0, {x, 1, n - 1}, {y, 1, n - 1}];
X = Table[x0 + x * h, {x, 1, n - 1}];
B = Table[2 * h^2, {x, 1, n - 1}];
```

Out[2]= 0.01

In[7]:=
```
For[i = 1, i < n, i++,
  {
   A[[i, i]] = -4 * X[[i]]^2;
   If[i ≠ 1, A[[i, i - 1]] = 2 * X[[i]]^2 - h * X[[i]]];
   If[i ≠ n - 1, A[[i, i + 1]] = 2 * X[[i]]^2 + h * X[[i]]];
  }];
B[[1]] -= y0 * (2 * X[[1]]^2 - h * X[[1]]);
B[[n - 1]] -= yf * (2 * X[[n - 1]]^2 + h * X[[n - 1]]);
```

In[10]:=
```
sol = LinearSolve[A, B]
```

Out[10]= {0.0000493561, 0.000195773, 0.000436409, 0.000768524, 0.00118947, 0.00169671, 0.00228776, 0.00296025, 0.00371188, 0.00454044, 0.00544376, 0.00641978, 0.00746649, 0.00858195, 0.00976428, 0.0110117, 0.0123223, 0.0136946, 0.0151268, 0.0166173, 0.0181646, 0.0197672, 0.0214236, 0.0231325, 0.0248924, 0.026702, 0.02856, 0.0304653, 0.0324165, 0.0344125, 0.0364521, 0.0385343, 0.040658, 0.042822, 0.0450255, 0.0472673, 0.0495466, 0.0518625, 0.0542139}

In[11]:=
```
Show[{Plot[0.5 * Log[x]^2, {x, x0, xf}]},
 {ListLinePlot[Transpose[{X, sol}], PlotStyle → Red]}]
```

Out[11]=