In[ ]:=
```
pressureGradient = -10; μ = 1;
nGrid = 40 + 1; Δy = 1/(nGrid - 1);
y = Table[(i - 1) Δy, {i, 1, nGrid}];
u = Array["u", nGrid];
```

In[ ]:=
```
discreteEqns = Table[
    μ (u[[i + 1]] - 2 u[[i]] + u[[i - 1]])/Δy^2 - pressureGradient == 0,
    {i, 2, nGrid - 1}];
```

In[ ]:=
```
boundaryConditions = {u[[1]] == 0, u[[nGrid]] == 0};
```

In[ ]:=
```
eqns = Join[discreteEqns, boundaryConditions];
```

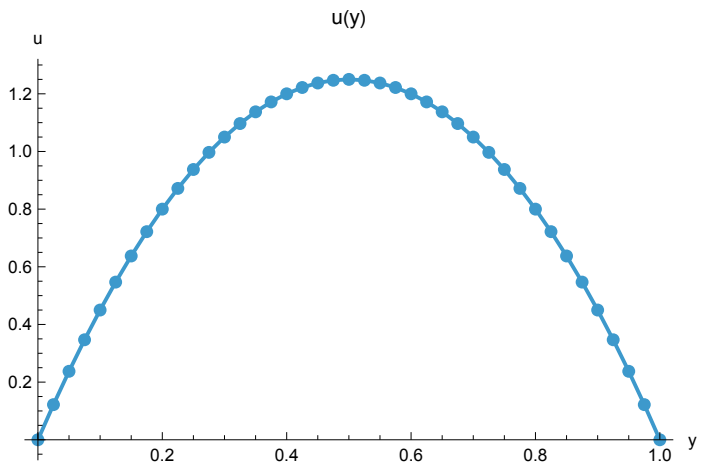
In[ ]:=
```
sol = NSolve[eqns, u];
```

In[ ]:=
```
uVals = u /. sol // #[[1]] &;
```

In[ ]:=
```
data = Table[{y[[i]], uVals[[i]]}, {i, 1, nGrid}];
```

In[ ]:=
```
ListLinePlot[data, PlotMarkers → Automatic,
 AxesLabel → {"y", "u"}, PlotLabel → "u(y)"]
```

Out[ ]=



In[ ]:=
```
uMean = N[Sum[uVals[[i]], {i, 1, nGrid}]] Δy
```

Out[ ]=
```
0.832812
```

In[ ]:=
```
uMax = N[Max[uVals]]
```

Out[ ]=
```
1.25
```

In[ ]:=
```
uMax/uMean
```

Out[ ]=
```
1.50094
```