

# Computational and Numerical Methods

## Group 16

### Set 13 (29-10-2018): Numerical Stability and Implicit Methods

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Show Code

Out[2]:

	h	y(x)	Error
0	0.100	8.100000e+01	8.100000e+01
1	0.050	2.560000e+02	2.560000e+02
2	0.020	1.000000e+00	1.000000e+00
3	0.010	0.000000e+00	-2.061154e-09
4	0.001	7.055079e-10	-1.355646e-09

Out[3]:

	h	y(x)	Error
0	0.100	8.264463e-03	8.264461e-03
1	0.050	7.716049e-04	7.716029e-04
2	0.020	1.693509e-05	1.693303e-05
3	0.010	9.536743e-07	9.516132e-07
4	0.001	5.265783e-09	3.204630e-09

We see that the forward Euler method is not stable as the values are not converging but wavering up and down the analytical solution. The backward Euler method is stable as the values converge as the  $h$  decreases.