

Comparison of Heun's and Euler's Methods

IVP:

$$\frac{dv}{dt} = g - \frac{c'}{m}v^2, \quad 0 < t < 1.$$

$$g = 9.81 \text{ m/s}^2, \quad m = 90 \text{ kg}, \quad c' = 0.225 \text{ kg/m}.$$

$$v(0) = 0.$$

Table 1: Results for 16 segments, $h = 0.3125$ s.

Computation #	v_{Heun} [m/s]	v_{Euler} [m/s]	t [s]
0	0	0	0.000000
1	3.0619538841	3.0656250000	0.3125
2	6.1092847148	6.1239077682	0.6250
3	9.1276565437	9.1602341383	0.9375
4	12.1032787450	12.1603045371	1.2500
5	15.0231513660	15.1104037509	1.5625
6	17.8752798751	17.9976503903	1.8750
7	20.6488523315	20.8102164688	2.1875
8	23.3343743436	23.5375093520	2.5000
9	25.9237596533	26.1703106438	2.8125
10	28.4103765788	28.7008691132	3.1250

Heun's and Euler's Methods

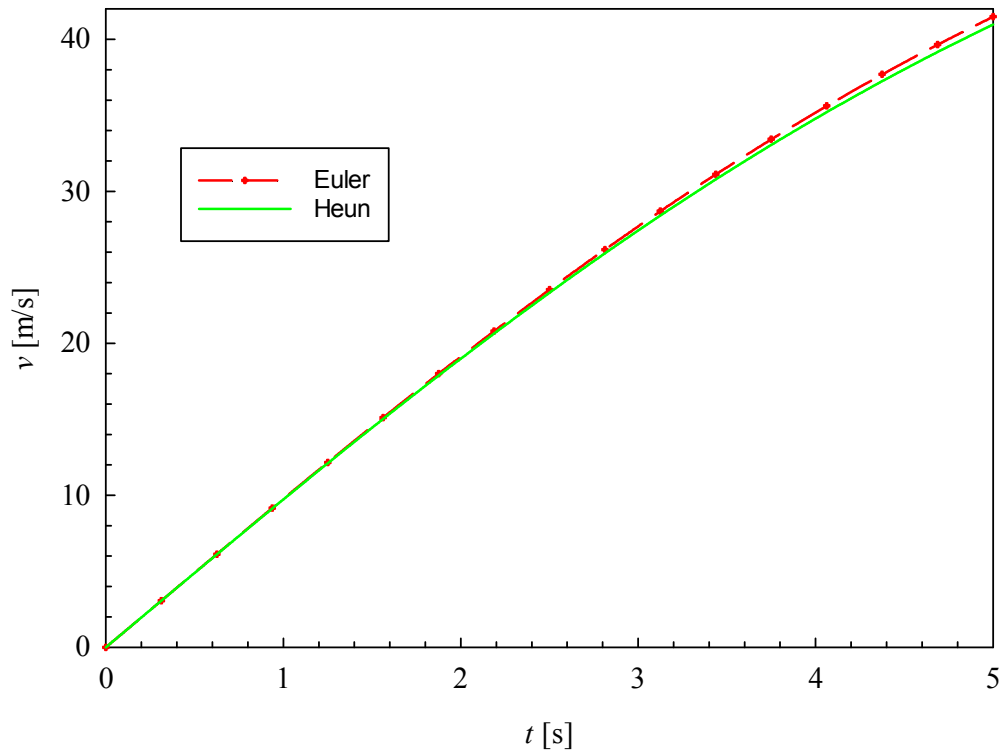


Fig. 1: Velocity vs. time generated by Heun's and Euler's methods. Number of segments = 16, $h = 0.3125$ s.