

DiffEq Ch.1.4: Euler's method

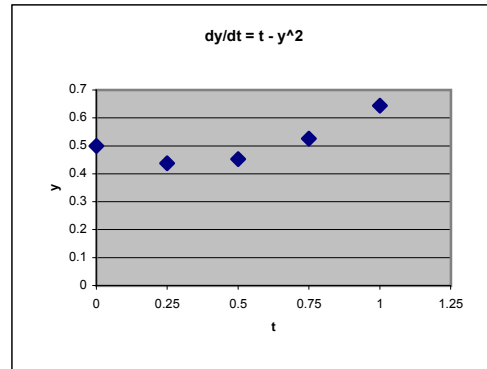
$$dy/dt = t - y^2$$

$$y(0) = 0.5$$

$$dt =$$

$$0.25$$

k	t(k)	y(k)	f = dy/dt	y(k+1)
0	0	0.5	-0.25	0.4375
1	0.25	0.4375	0.058594	0.452148
2	0.50	0.452148	0.295562	0.526039
3	0.75	0.526039	0.473283	0.64436
4	1.00	0.64436	0.584801	0.79056



(b)

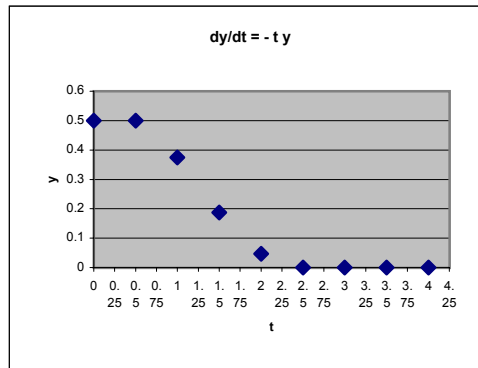
$$dy/dt = (-t y)$$

$$y(0) = 0.5$$

$$dt =$$

$$0.50$$

k	t(k)	y(k)	f = dy/dt	y(k+1)
0	0	0.5	0	0.5
1	0.50	0.50	-0.25	0.375
2	1.00	0.38	-0.375	0.1875
3	1.50	0.19	-0.28125	0.046875
4	2.00	0.05	-0.09375	0.000000
5	2.50	0.00	0	0
6	3.00	0.00	0	0
7	3.50	0.00	0	0
8	4.00	0.00	0	0



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$$dy/dt = y \sin(t)$$

$$y(0) = 0.5$$

$$dt =$$

$$0.50$$

k	t(k)	y(k)	f=dy/dt	y(k+1) = y(k) + f dt
0	0	0.5	0	0.5
1	0.50	0.5	0.239713	0.619856
2	1.00	0.619856	0.521591	0.880652
3	1.50	0.880652	0.878446	1.319875
4	2.00	1.319875	1.200159	1.919954
5	2.50	1.919954	1.149039	2.494474
6	3.00	2.494474	0.35202	2.670484
7	3.50	2.670484	-0.936761	2.202104
8	4.00	2.202104	-1.666557	1.368825
9	4.50	1.368825	-1.338067	0.699791
10	5.00	0.699791	-0.671047	0.364268
11	5.50	0.364268	-0.257006	0.235765
12	6.00	0.235765	-0.065876	0.202827
13	6.50	0.202827	0.043632	0.224643
14	7.00	0.224643	0.147587	0.298436
15	7.50	0.298436	0.279933	0.438403
16	8.00	0.438403	0.433738	0.655272

