Euler framåt: tidsstegstest

Ekvation:

$$y' = -8ty + t^{3/2} \quad t > 0$$
$$y(0) = 1$$

Obs: ekvationen **stabil** m a p begynnelsevärden!

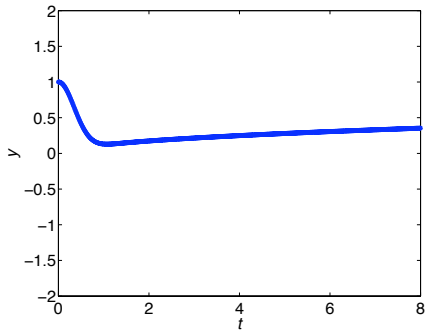
Euler framåt:

$$y_{k+1} = y_k + \Delta t(-8t_k y_k + t_k^{3/2}) \quad k = 0, 1, \ldots$$
$$y_0 = 1$$

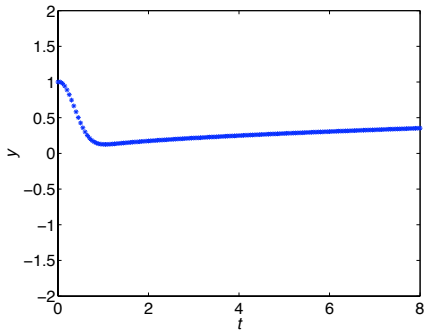
Tidssteg: $\Delta t = 0.01, 0.05, 0.075, 0.1$

Löser till tidpunkten $t = 8$, d v s för 800, 160, 107 respektive 80 tidssteg

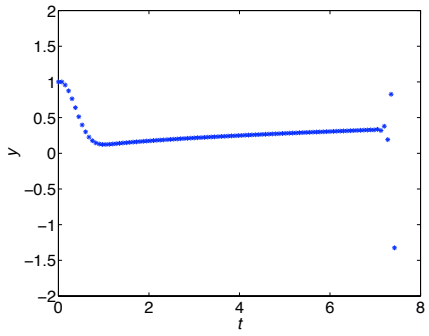
Numerical results



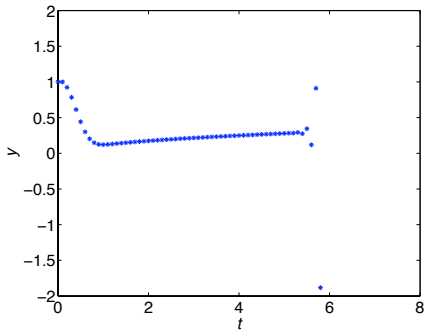
$\Delta t = 0.01$



$\Delta t = 0.05$



$\Delta t = 0.075$: numerisk instabil!



$\Delta t = 0.1$: numerisk instabil!