Euler's

$$\begin{cases} \frac{dy}{dx} = f(x,y) \\ y(x_0) = y_0 \end{cases}$$

S, In. "starts" at (x_0, y_0) w/ slope $= f(x_0, y_0)$

Choose small step-size h.

Find new pts recursively,

$$\begin{cases} x_{i+1} = x_i + h \\ y_{i+1} = y_i + h\, f(x_i, y_i) \end{cases}$$

run, slope, rise

Ex: $\begin{cases} \frac{dy}{dx} = y \\ y(2) = 1 \end{cases}$ $(h = 0.1)$

x	y	(slope) m	rise h·m
2	1	1	0.1
2.1	1.1	1.1	0.11
2.2	1.21	1.21	0.121
2.3	1.3331		

Ch. 3.1 Linear models

Newton's law of cooling: $\frac{dT}{dt} = K(T - T_m)$

K: const. of proportionality; T: temp. of object; T_m: const. temp. of environment

Ex: 3.1:14

$T(0) = ?$

$T_m = 5$

$T(1) = 55$

$T(5) = 30$

$T(0) \overset{???}{=} 55 + \frac{55-30}{4} = 61.25\ (^\circ F)$