The Picard Process

How You GET YOUR $Y_{k+1}(t)$

YOU HAVE: $Y_k(t)$ [Your last approximation]

$\frac{dy}{dt} = G(t, y(t))$ [Your derivative function]

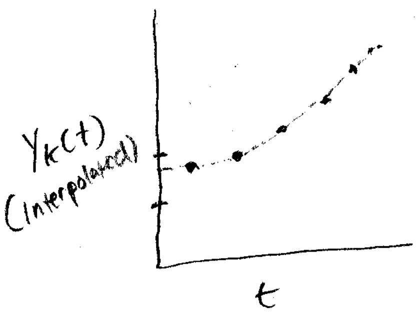
ode23 [your close personal friend who solves ODEs]

$y(t) = F(t, y(t)) = Y_0 + \int_0^t G(s, y(s))\,ds$ [Fixed-point form of a self-evident statement]

$Y_{k+1}(t) = F(t, Y_k(t))$ [Iterative sequence]

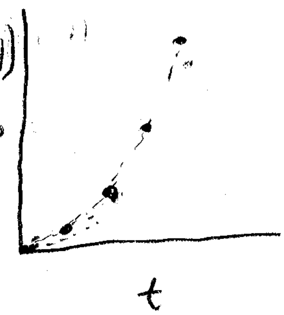
$Y_0(t) = Y_0$ [starting condition of sequence]

$Y(0) = Y_0$ [initial condition of ODE for Y]



ODE23 (takes pleasure in solving the system, thereby computing the integral, $I(t)$)

$I(t, Y_k(t)) = \int_0^t G(s, Y_k(s))\,ds$



YOUR SYSTEM

$I(t, y) = \int_0^t G(s, y(s))\,ds$ (the integral),

$\frac{dI}{dt} = G(t, y(t))$

$I(0, Y) = \int_0^0 G(s, y(s))\,ds = 0$

Y_0

$Y_0 + I(t, Y_k)$

$= Y_0 + \int_0^t G(s, Y_k(s))\,ds$

$= F(t, Y_k(t))$

$= Y_{k+1}(t)$