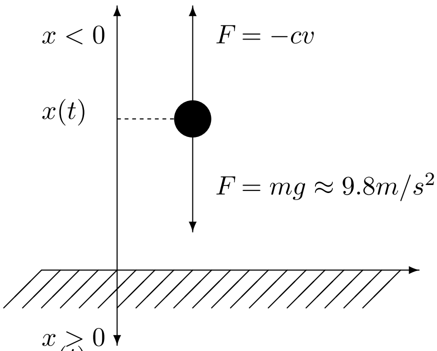
$_{l}ibreCadalibre]Modelizarmatemticamenteelmovimientodeuncuerpodemasaenlasproximidadesdelasuperficieterr$



$x(t) =$
$v(t) =$
$\frac{dx}{dt} =$
$F_{grav} =$
$= mg$
$g =$
$9.8m/s^2$
$F_{roz} =$
$= -cv$
$c >$
0
$_{d}e_{N}ewtonSegundaLeydeNewton, estoeslasumadelasfuerzastotalesqueactuansobreuncuerpodemasaesigualalproductod$

$$ma(t) = mv'(t) = F = F+F = mg-cv$$

$$x''(t) + \frac{c}{m}x'(t) = g.$$

(1)

$$v'(t) + \frac{c}{m}v = g.$$

(2)

$$v(t) = \frac{m}{c}g+ke^{-\frac{c}{m}t},$$

(3)

$C \in$
(1in,1in)
$>>>$
[file]scripts/sol$_{c}aida.pyqrcode$
SymPy
(1in,1in)
Ver
[file]scripts/resu$_{c}aida.pyqrcode$

$$\frac{\partial^2 u}{\partial x^2}+\frac{\partial^2 u}{\partial y^2} = 0$$

ecuacin es- calar

$$\begin{cases} x' = y \\ y' = -(x) \end{cases}$$

$e^{\frac{c}{m}t}$
t

$$\frac{mg}{c}e^{\frac{c}{m}t} = \int ge^{\frac{c}{m}t}dt = \int v'(t)e^{\frac{c}{m}t}+\frac{c}{m}e^{\frac{c}{m}t}vdt = e^{\frac{c}{m}t}v+C.$$

v
$k =$
$-C$

$x = e^y+y+CparaC \in$

(4)

$$y'(e^y+1) = 1.$$

$$1 = e^y y'+y'$$

$y' =$
$1/(1+$
$e^y)$
n

$$F(x, y(x), y'(x), \ldots, y^{(n)}(x)) = 0.$$

$F :$
$(a, b)\times$
$\Omega \to$
Ω
$n+1$
(a, b)
$f :$
$(a, b) \subset\to$

$$y'(x) = f(x).$$

$x_0 \in$

k
n
$$F(x, y(x), y'(x), \dots, y^{(n)}(x)) = 0.$$

$F :$
$(a,b)\times$
$\Omega \to^k$

$$\Omega \subset \underbrace{^k \times \cdots \times^k}_{n+1-}$$

(a,b)
$\overline{}$
k
k
k
$y =$
$(y_1, \dots y_k)$
$k =$
2
$n =$
1
$(a,b) =$
$\Omega =$
$\times$
$F :^2$
$\times^2 \to^2$
$F\,((\,x\,)\,v, (\,\xi\,)\,\eta) = (\,\xi\,) - v\eta + (x)$

n
1
forma ex- pl- cita
$^{(n)}(x) =$
$f(x, y(x), y'(x), \dots, y^{(n-1)}(x)) =$
$0.eq : eq_expl$
$ien_efinidobienplanteadoseyunHadamardsisatisface que$
scale=.3]imagenes/hadamard.jpg
$x_0 \in$
Jacques
(a,b)
Hadamard
F
(1865-
$(a,b)\times$
1963)
$\Omega \to$
$y_0, y_0^1, \dots, y_0^{n-1} \in$
$$\begin{cases} F(x, y, y', \dots, y^{(n)}) = 0 x \in (a,b) \\ y(x_0) \quad = y_0 \\ y'(x_0) \quad = y_0^1 \\ \\ y^{(n-1)}(x_0) = y_0^{n-1} \end{cases}$$
(5)

F
x_0
x
$y =$
$y(x)$
2
$n =$
2
(y, y')
es- tado
??
??
??
x_0
1
??
??
??
$$F(x, y(x), y'(x)) = 0,$$

$F :$
$(a,b)\times$
$\Omega \to$
Ω
2
y'
$f :$
$\Omega' \to$
Ω'
2
$$y' = f(x, y).$$

$(x_0, y_0) \in$
Ω'
$$\begin{cases} y' \quad = f(x,y) \\ y(x_0) = y_0 \end{cases}$$

$$y = y(x, c),$$
(6)
$c \in$
$_n aramcomounaecuacinimplcitaf(x, y, c) =$