Clase Práctica 2

Javier Alejandro Oramas López

1

$$\frac{\partial T}{\partial t} = -k(T - A)$$

$$\frac{\partial T}{T - A} = -k\partial t$$

$$\int \frac{\partial T}{T - A} = -\int k\partial t$$

$$\log|T - A| = -(kt + C)$$

$$T - A = e^{-kt+C}$$

$$T - A = \frac{e^{-}kt}{C}$$

$$T = \frac{1}{C}e^{kt} - A$$

2

1. P: Población (cte)
2. N: Personas Infectadas
3. P-N: Personas sanas
4. k: cte de proporcionalidad

$$\frac{\partial N}{\partial t} = k(P - N)N$$

$$\int \frac{\partial N}{N(P - N)} = \int k(\partial t)$$

$$-\frac{1}{P}\left(-\ln\frac{|N|}{|P|} + \ln|\frac{N}{P} - 1|\right) = kt + C$$

$$-\left(-\ln\frac{|N|}{|P|} + \ln|\frac{N}{P} - 1|\right) = P(kt + C)$$

$$\ln \frac{|N|}{|P|} - \ln |\frac{N}{P} - 1| = P(kt + C)$$

$$\ln(\frac{\frac{N}{P}}{\frac{N}{P} - 1}) = P(kt + C)$$

$$\frac{\frac{N}{P}}{\frac{N}{P} - 1} = e^{P(kt+C)}$$

$$\frac{N}{N - P} = e^{P(kt+C)}$$

3

$$\frac{\partial y}{\partial x} = \sin x - y$$

$$\partial y = \sin x - y\partial x$$

$$\partial y - \sin x - y\partial x = 0$$

$$\partial y - \sin x - y\partial x = 0$$

$t = x - y$
$\partial t = \partial x - \partial y$
$\partial y = \partial x - \partial t$

$$\partial x - \partial t - \sin t\partial x = 0$$

$$-\partial t - (1 - \sin t)\partial x = 0$$

$$\partial x = \frac{\partial t}{1 - \sin t}$$

$$\partial x - \frac{\partial t}{1 - \sin t} = 0$$

$$\int \partial x - \int \frac{\partial t}{1 - \sin t} = 0$$

$$x - \int \frac{\partial t}{1 - \sin t}\frac{1 + \sin t}{1 - \sin t} = 0$$

$$x - \int \frac{1 + \sin t}{1 - \sin^2 t}\partial t = 0$$

$$x - \int \frac{1 + \sin t}{\cos^2 t}\partial t = 0$$

$$x - \int \frac{1}{\cos^2 t}\partial t + \int \frac{\sin t}{\cos^2 t}\partial t = 0$$

$$x - \int \sec^2 t\partial t + \int \cos^{-2} t\partial t = 0$$

$u = \cos t$
$\partial u = -\sin t$

$$x - \tan t + \frac{-u^{2+1}}{-2+1} = 0$$

$$x - \tan t + \frac{-cos^{-1}t}{-1} = 0$$

$$x - \tan(x-y) - \sec(x-y) = 0$$

4

4.1

$$y^{'} = x + y$$

$$y^{'} = k, k = cte$$

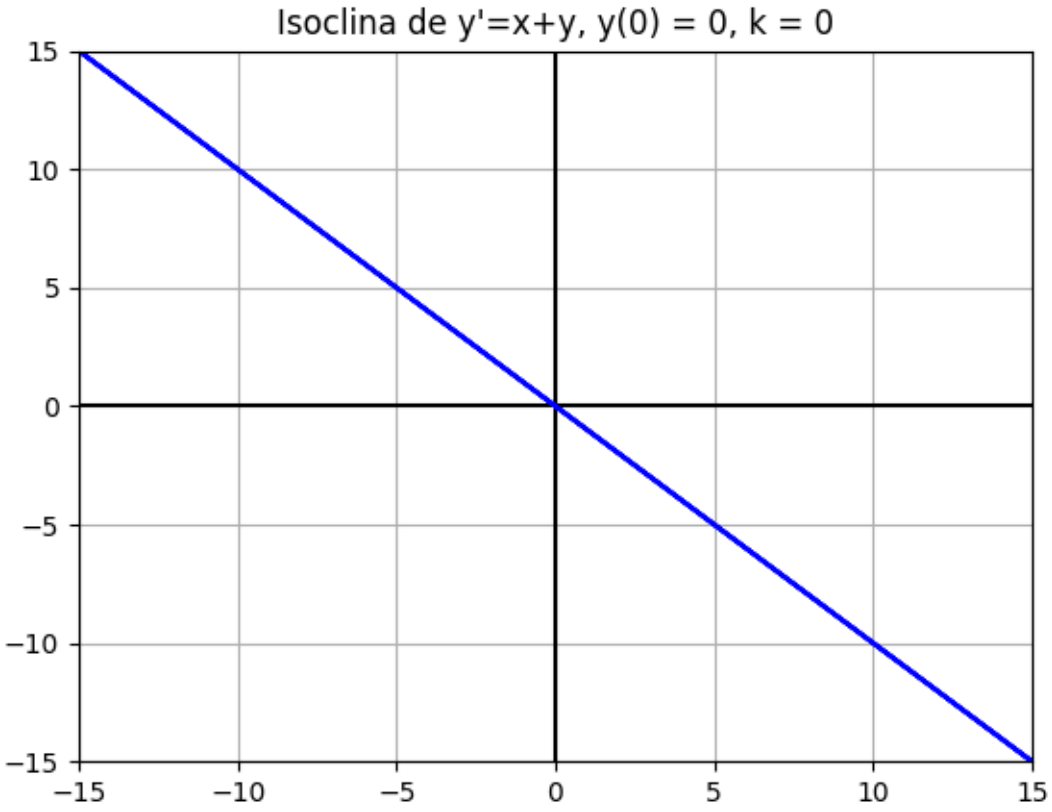
$$x + y = k$$

$$y = k - x$$

$$y(0) = 0$$

$$0 = 0 + k$$

$$k = 0$$



4.2

$$y^{'} = 2x - y$$

$$y^{'} = k, k = cte$$

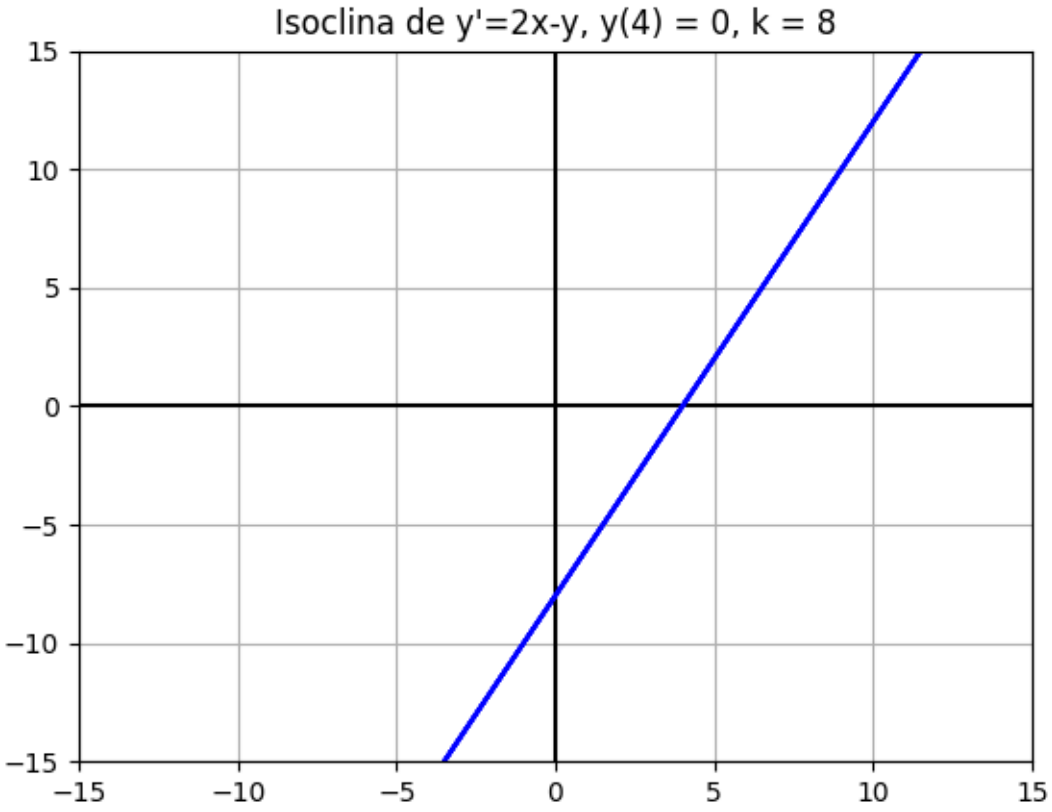
$$2x - y = k$$

$$y = 2x - k$$

$$y(4) = 0$$

$$0 = 2(4) - k$$

$$k = 8$$


Isoclina de y'=2x-y, y(4) = 0, k = 8
15
10
5
0
−5
−10
−15
−15
−10
−5
0
5
10
15