$\dot{x} = x(3-2x-y)$
$\dot{y} = y(2-x-y)$

Nullclines: x-null: $x(3-2x-y)=0$
2 pieces: $x=0$ and $y=3-2x$

y-null: $y(2-x-y)=0$
2 pieces: $y=0$ and $y=2-x$

St. states: $\begin{cases} x(3-2x-y)=0 \\ y(2-x-y)=0 \end{cases}$ $x=0$ or $y=3-2x$
plug in
$y(2-y)=0$ $y(2-x-3+2x)=0$
$y=0$ or $y=2$ $y=0$ or $x=1$

(x^*,y^*): $\boxed{(0,0)\ (0,2)}$ & $\boxed{(\frac{3}{2},0)\quad (1,1)}$

Jacobian (linearization):

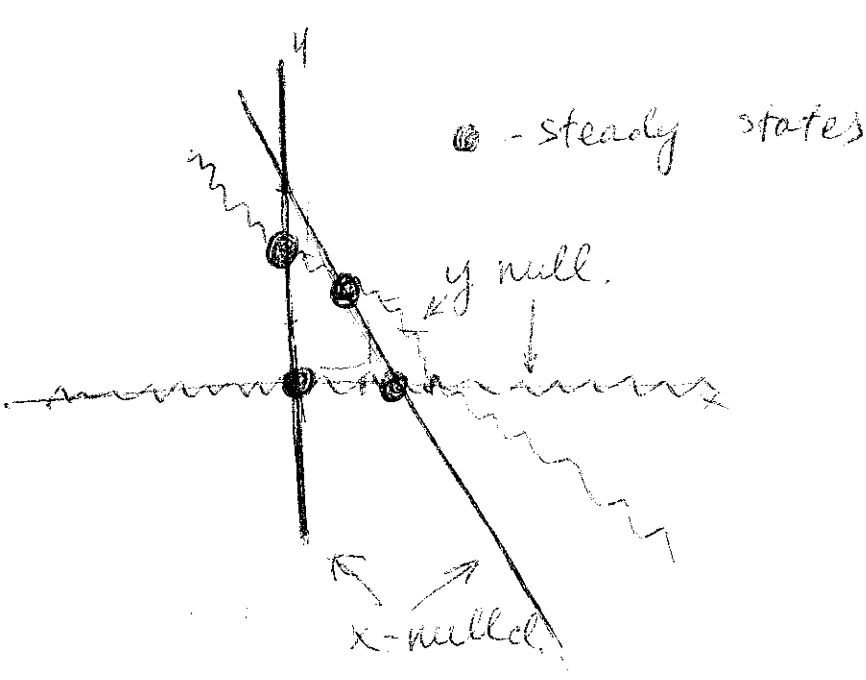
$A = \begin{vmatrix} 3-4x-y & -x \\ -y & 2-x-2y \end{vmatrix}$

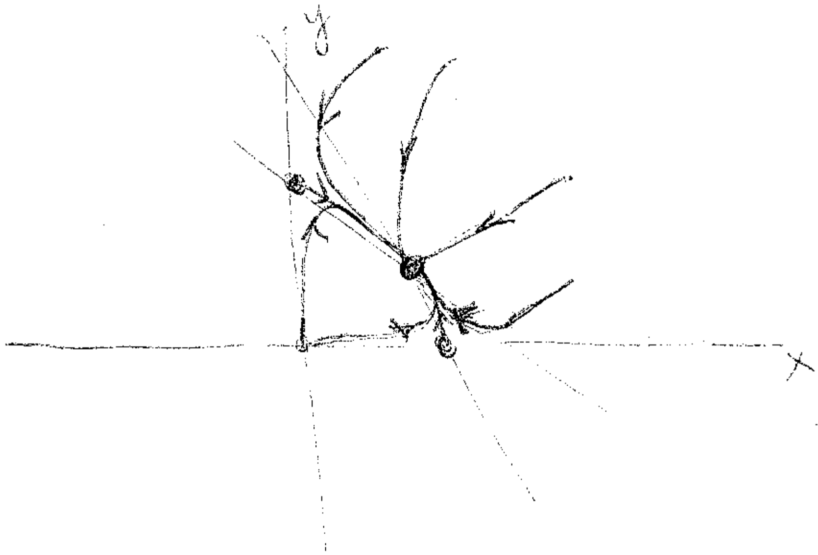
$(0,0)$: $\begin{vmatrix} 3 & 0 \\ 0 & 2 \end{vmatrix}$ $\lambda_1=3, \lambda_2=2 \Rightarrow (0,0)$ is unstable node

$(0,+2)$: $\begin{vmatrix} 1 & 0 \\ -2 & -2 \end{vmatrix}$ $\lambda_1=1$ $\lambda_2=-2 \Rightarrow (0,2)$ is a saddle

$(\frac{3}{2},0)$ $\begin{vmatrix} -3 & -3/2 \\ 0 & 1/2 \end{vmatrix}$ $\lambda_1=-3$ $\lambda_2=\frac{1}{2} \Rightarrow (\frac{3}{2},0)$ is a saddle

$(1,1)$: $\begin{vmatrix} -2 & -1 \\ -1 & -1 \end{vmatrix}$; $\begin{vmatrix} -2-\lambda & -1 \\ -1 & -1-\lambda \end{vmatrix} = \lambda^2+3\lambda+2-1=\lambda^2+3\lambda+1=0$
$\lambda = \frac{-3\pm\sqrt{9-4}}{2} = \frac{-3\pm\sqrt{5}}{2}$; stable node


y
- steady states
y null.
x
x-nullcl.


y
x