

Sesión VI

Gráficos avanzados

① Dibujo libre

② Representación de funciones

③ Representación de datos

El paquete Tikz

El paquete tikz nos permite general dibujos

Código

```
\documentclass{standalone} % say

\usepackage{tikz}

\begin{document}
Trabajaremos con

\begin{tikzpicture}
\draw (-1.5,0) -- (1.5,0);
\draw (0,-1.5) -- (0,1.5);
\end{tikzpicture}.

\end{document}
```

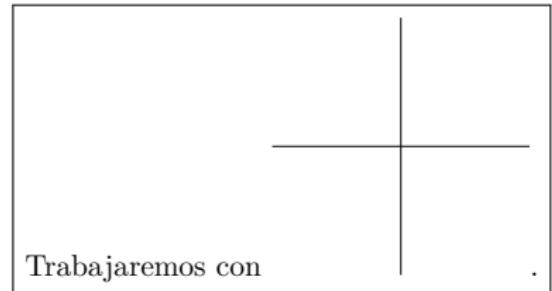


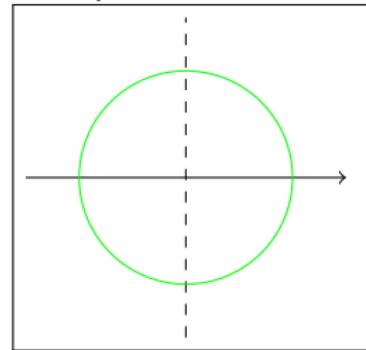
Figura: Resultado de compilar

Dibujo libre

Existen diferentes tipos de líneas y figuras, las opciones son ilimitadas

Código

```
\begin{tikzpicture}
\draw[->] (-1.5,0) -- (1.5,0);
\draw[dashed] (0,-1.5) -- (0,1.5);
\draw[green] (0,0) circle (1cm);
\end{tikzpicture}
```



Bellos ejemplos se pueden encontrar en
<http://www.texample.net/tikz/examples/>

Representación de grafos

Código

```
\documentclass[tikz, border=10pt]{standalone}
\usepackage{tikz}
\tikzset{main node/.style={circle, fill=blue!20, draw, minimum size=1cm, inner sep=0pt},}
\begin{document}
\begin{tikzpicture}
\node[main node] (1) {$1$};
\node[main node] (2) [below left = 2.3cm and 1.5cm of 1] {$2$};
\node[main node] (3) [below right = 2.3cm and 1.5cm of 1] {$3$};

\path[draw, thick]
(1) edge node {} (2)
(2) edge node {} (3)
(3) edge node {} (1);
\end{tikzpicture}
\end{document}
```

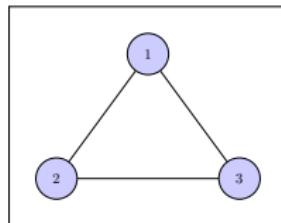
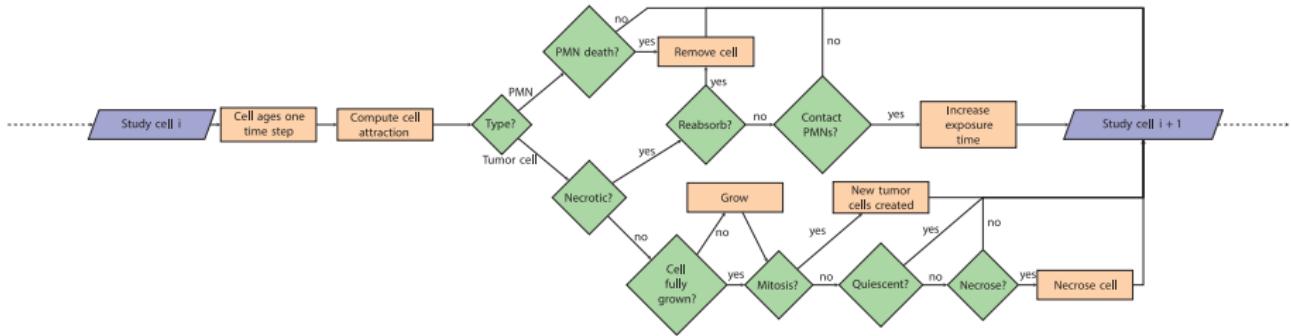


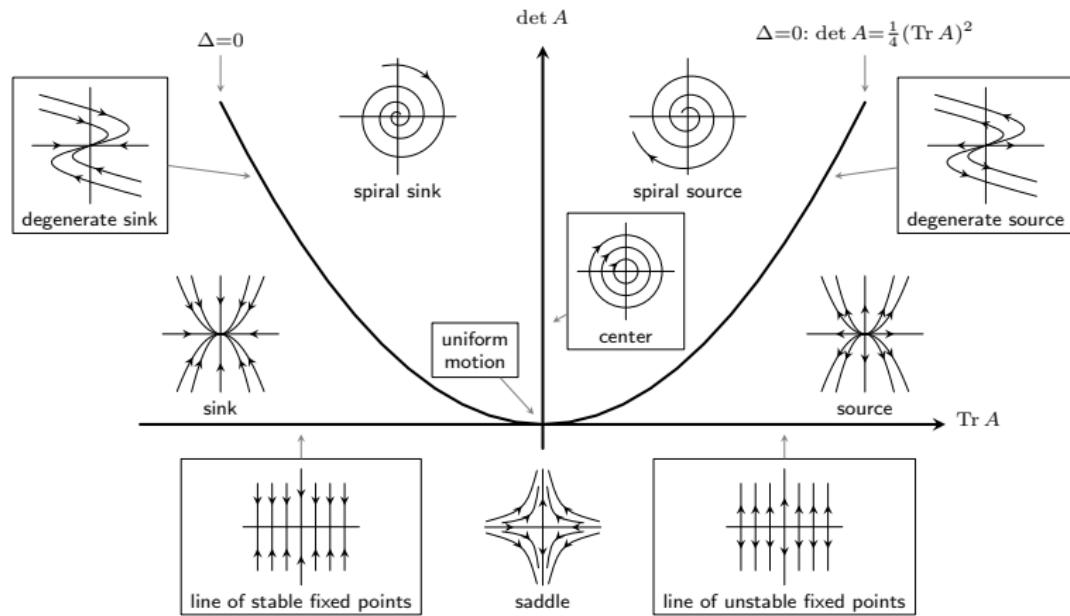
Figura: Resultado de compilar

Diagramas de flujo



Desvaríos excesivos

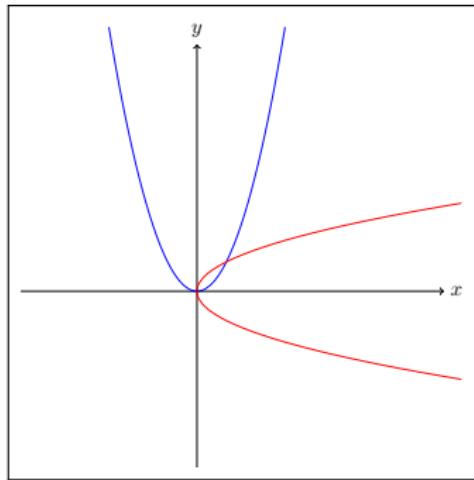
Poincaré Diagram: Classification of Phase Portraits in the $(\det A, \text{Tr } A)$ -plane



Representación de curvas

Código

```
\documentclass{standalone}
\usepackage{tikz}
\begin{document}
\begin{tikzpicture}
\draw[->] (-3,0) -- (4.2,0) node[right] {$x$};
\draw[->] (0,-3) -- (0,4.2) node[above] {$y$};
\draw[scale=0.5,domain=-3:3,smooth,variable=x,blue] plot ({\x},{\x*\x});
\draw[scale=0.5,domain=-3:3,smooth,variable=y,red] plot ({\y*\y},{\y});
\end{tikzpicture}
\end{document}
```



Representación de funciones: pgfplots

Código

```
\documentclass{standalone}
\usepackage{pgfplots}

\begin{document}
\begin{tikzpicture}
\begin{axis}[xmax=9,ymax=9,samples=50]
    \addplot[blue] (x,x*x);
    \addplot[red] (x*x,x);
\end{axis}
\end{tikzpicture}
\end{document}
```

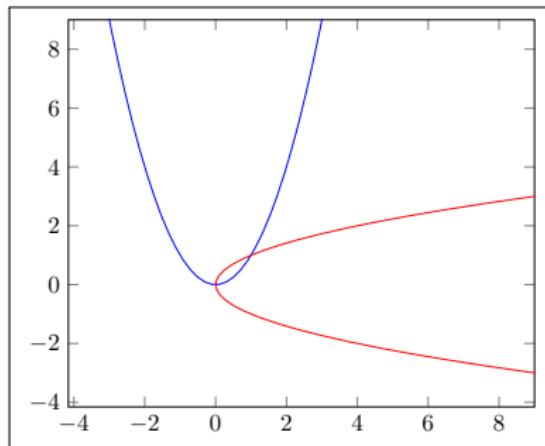


Figura: Resultado de compilar

Una buena lista de ejemplos del manual:

<http://pgfplots.sourceforge.net/gallery.html>

Representación de datos

Código

```
\documentclass{standalone}
\usepackage{pgfplots}

\begin{document}
\begin{tikzpicture}
\begin{axis}
\addplot
    table [x=a, y=c, col sep=comma]
    {data.csv};
\end{axis}
\end{tikzpicture}
\end{document}
```

Código [data.csv]

```
a,b,c,d
1,4,5,1
2,3,1,5
3,5,6,1
4,1,4,9
5,3,4,7
```

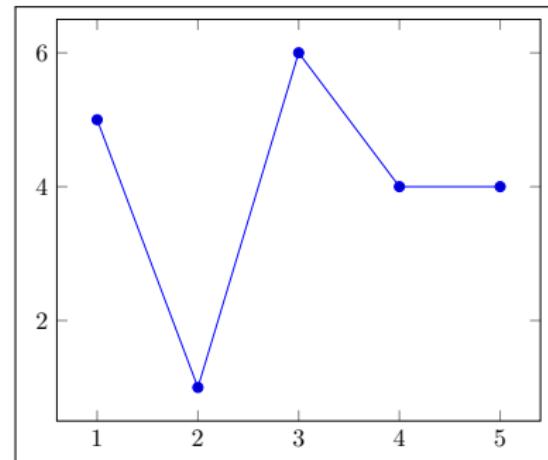


Figura: Resultado de compilar