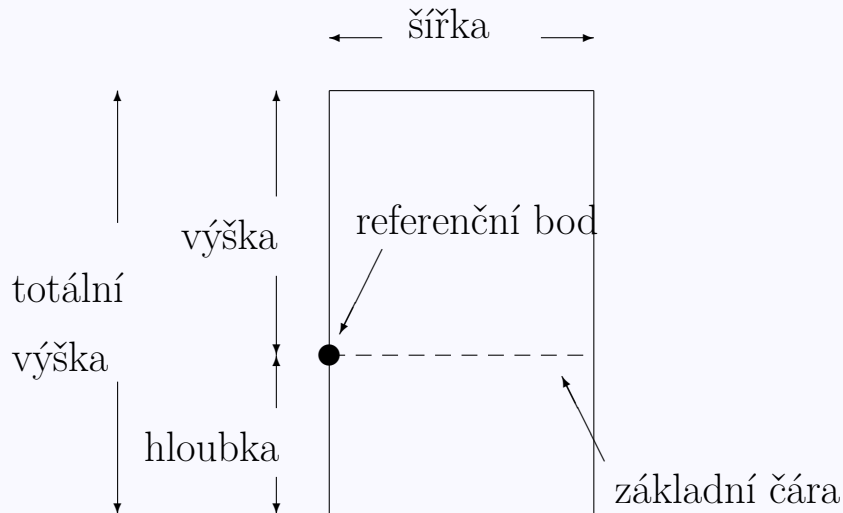


```
\usepackage{graphicx}
```

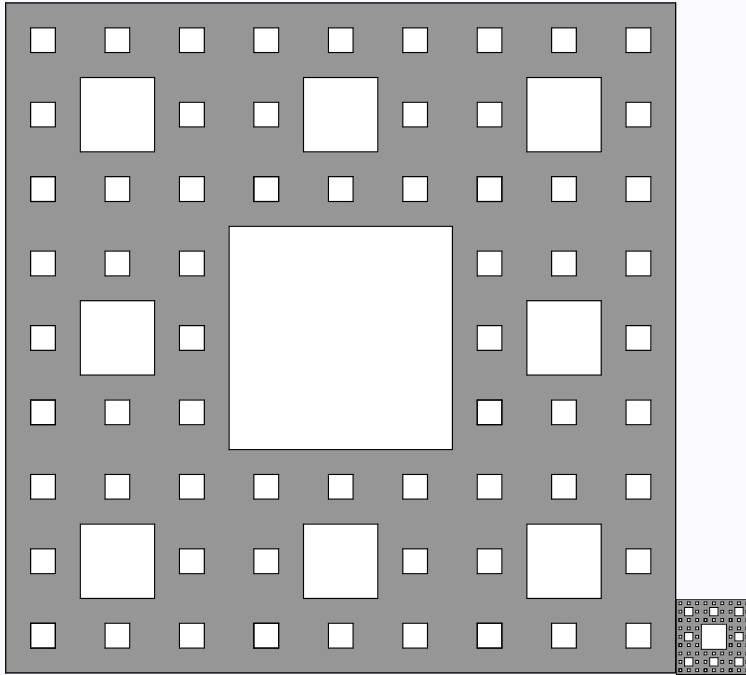
```
\includegraphics{anti.pdf}
```



Jednoduchý *box* v L^AT_EXu



Nepovinné parametry slouží k další grafické úpravě vkládaných objektů (obrázků, textu apod.): `height`, `totalheight`, `width`, `scale`, `angle`, `origin`, `bb`, `viewport`, `clip`, `noclip`, `draft`.



```
\includegraphics [width=0.5\textwidth] {koberec.pdf}%  
\includegraphics [height=1cm] {koberec.pdf}
```

Grafika

Grafika

```
\begin{center}
```

```
\includegraphics[angle=90,totalheight=2cm]{box.pdf}
```

```
\includegraphics[totalheight=2cm,angle=90]{box.pdf}
```

```
\end{center}
```

Grafika

Grafika

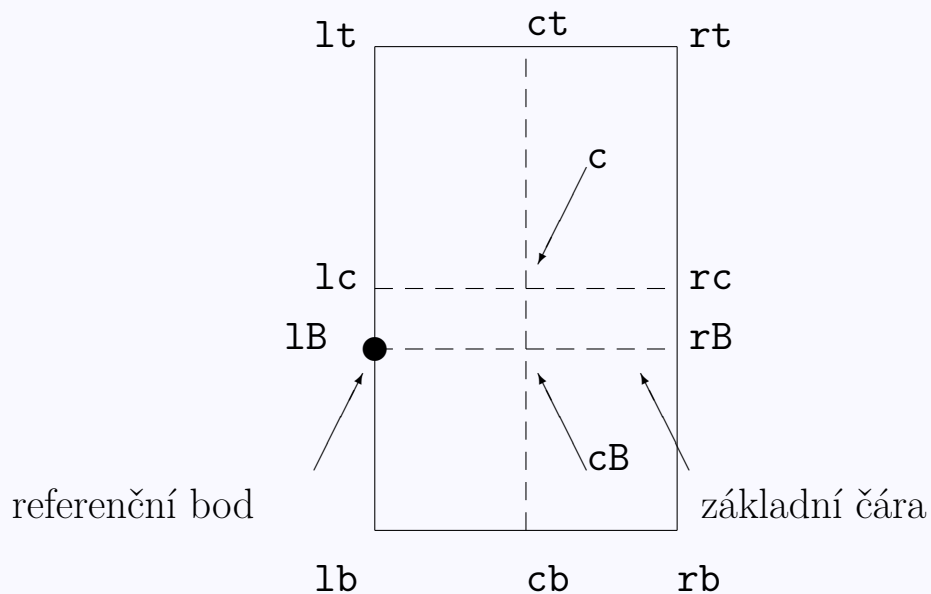
```
\begin{center}
\includegraphics [width=2cm] {box.pdf}
\hspace{1in}
\includegraphics [width=2cm, angle=-90] {box.pdf}
\end{center}
```

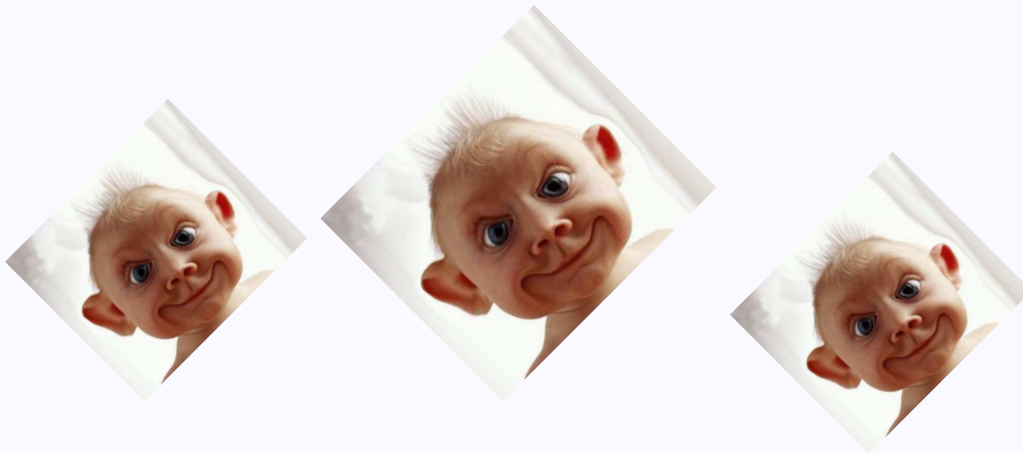
Grafika

Grafika

```
\begin{center}
\includegraphics [width=2cm] {box.pdf}
\hspace{1in}
\includegraphics [width=2cm, origin=br, angle=-90] {box.pdf}
\end{center}
```

Možnosti volby středu otáčení





```
\includegraphics[angle=45,width=4cm]{anti.pdf}
```

```
\includegraphics[width=4cm,angle=45]{anti.pdf}
```

```
\includegraphics[angle=45,origin=c,width=4cm]{anti.pdf}
```



```
\noindent\includegraphics [width=4cm] {anti.pdf}%  
\hfill\includegraphics [width=4cm] {anti.pdf}
```



```
\noindent\hfill\includegraphics [width=4cm] {anti.pdf}%  
\hfill\includegraphics [width=4cm] {anti.pdf}\hspace*{\fill}
```




```
\begin{center}  
\begin{minipage}[b]{.5\textwidth}  
\centering  
\includegraphics[width=\textwidth]{anti.pdf}  
\end{minipage}%  
\hfill\begin{minipage}[b]{.5\textwidth}  
\centering  
\includegraphics[width=\textwidth]{anti.pdf}  
\end{minipage}  
\end{center}
```

Vertikální srovnání prostředí minipage

Grafika

Grafika

```
\begin{center}
\begin{minipage}[b]{.25\linewidth}
\centering
\includegraphics[width=1.5cm]{box}
\end{minipage}%
\begin{minipage}[b]{.25\linewidth}
\centering
\includegraphics[width=1.5cm,angle=-45]{box}
\end{minipage}
\end{center}
```

Grafika

Grafika

```
\begin{center}
\begin{minipage}[t]{.25\linewidth}
\centering
\includegraphics[width=1.5cm]{box}
\end{minipage}%
\begin{minipage}[t]{.25\linewidth}
\centering
\includegraphics[width=1.5cm,angle=-45]{box}
\end{minipage}
\end{center}
```

Srovnání „spodků“ prostředí minipage



Grafika



Grafika

```
\begin{center}
\begin{minipage}[b]{.25\linewidth}
\centering
\includegraphics[width=1in]{box}
\par\vspace{0pt}
\end{minipage}%
\begin{minipage}[b]{.25\linewidth}
\centering
\includegraphics[width=1in,angle=-45]{box}
\par\vspace{0pt}
\end{minipage}
\end{center}
```

Srovnání „vršků“ prostředí minipage

Grafika

Grafika

```
\begin{center}
\begin{minipage}[t]{.25\linewidth}
\vspace{0pt}
\centering
\includegraphics[width=1in]{box}
\end{minipage}%
\begin{minipage}[t]{.25\linewidth}
\vspace{0pt}
\centering
\includegraphics[width=1in,angle=-45]{box}
\par\vspace{0pt}
\end{minipage}
\end{center}
```

Vložení stejného obrázku vícekrát

```
\newsavebox{\mujbox}
```

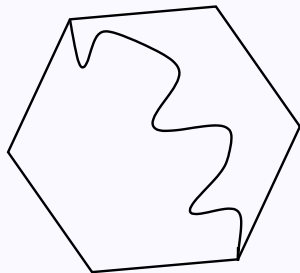
```
\sbox{\mujbox}{\includegraphics [width=1in] {box.pdf}}
```

Na místě, kam chceme obrázek umístit dáme `\usebox{\mujbox}`, úpravy provádíme příkazy `\scalebox`, `\resizebox` nebo `\rotatebox`.



```
\begin{center}  
\begin{minipage}[t]{.4\linewidth}  
\vspace{0pt}  
\centering  
\usebox{\mujbox}  
\end{minipage}%  
\begin{minipage}[t]{.4\linewidth}  
\vspace{0pt}  
\centering  
\rotatebox{-45}{\usebox{\mujbox}}  
\par\vspace{0pt}  
\end{minipage}  
\end{center}
```

Zapouzdřený postscript (EPS)



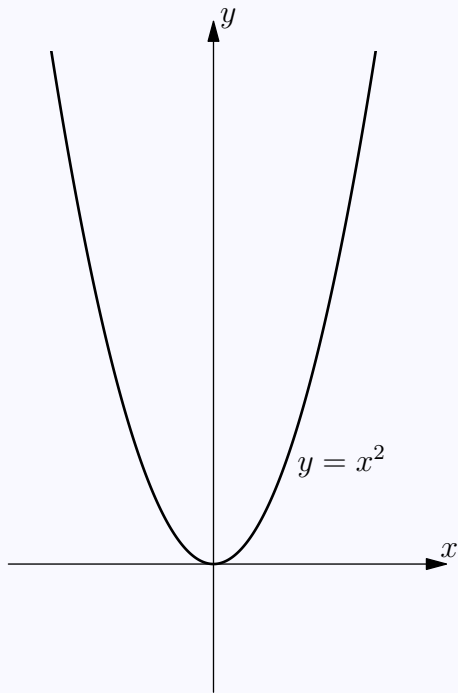
```
%!PS-Adobe-2.0 EPSF-2.0
%%Title: sest.eps
%%Creator: fig2dev Version 3.2
%%CreationDate: Sat Aug 31 20:17:51 2002
%%Orientation: Portrait
%% BoundingBox: 0 0 114 103
%%Pages: 0
%%BeginSetup
%%EndSetup
%%Magnification: 1.0000
%%EndComments
```

Čtyři čísla specifikující BoundingBox udávají souřadnice levého dolního a pravého horního rohu. V našem případě má levý dolní roh souřadnice (0, 0) a pravý horní roh (114, 103), tj. obrázek je 114 **bp** široký a 103 **bp** vysoký.

- **xfig** je volně dostupný (tzv. freeware) program pro UNIX/Xwindows. Lze v něm nakreslit obrázek, který bude importován ve formátu EPS.
<https://sourceforge.net/projects/mcj/>
- **ImageMagick** lze použít nejen pro konverzi obrázků z jednoho grafického formátu do jiného, ale i k úpravě velikosti, barev apod.
Více informací včetně manuálu: <http://www.imagemagick.org/script/index.php>. Spustíme příkazem `display`.
- **KTikz** (příkaz `ktikz`)
<http://www.hackenberger.at/blog/ktikz-editor-for-the-tikz-language/>
- **Matcha**, online L^AT_EX editor
<https://www.mathcha.io/editor>
- **Asymptote** (příkaz `xasy`)
<http://asymptote.sourceforge.net/>
- Metafont, Metapost, XYpixmap, MFpic, Inkscape...
- **Latexdraw** (příkaz `latexdraw`)
<http://latexdraw.sourceforge.net/>

Asymptote

```
\usepackage{asymptote}
```



```
\begin{asy}[width=6cm]
import graph;
size(10cm,0);
real xmin=-4,xmax=4;
real ymin=-2,ymax=10;
real f(real x) {return x^2;}
draw(graph(f,xmin,xmax,n=400),
      linewidth(1bp));
label("$y=x^2$", (2.5,2));
ylimits(-2.5,10,Crop);
xaxis(Label("$x$",position=EndPoint,
            align=NE),Arrow);
yaxis(Label("$y$",position=EndPoint,
            align=NE),Arrow);
\end{asy}
```

Pro kompilaci grafiky použijeme posloupnost příkazů

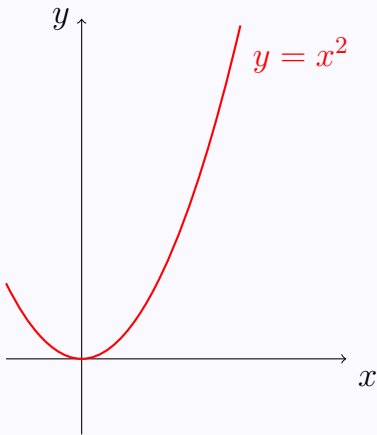
```
pdflatex dokument.tex
```

```
asy dokument-*.asy
```

```
pdflatex dokument.tex
```


Tikz

```
\usepackage{pgf,tikz}
\usetikzlibrary{arrows}
```



```
\begin{tikzpicture}[domain=0:2]
\draw[->] (-1,0) -- (3.5,0)
node[below right] {$x$};
\draw[->] (0,-1) -- (0,4.5)
node[left] {$y$};
\draw[red,thick] (-1,1)
parabola bend (0,0) (2.1,4.41)
node[below right] {$y=x^2$};
\end{tikzpicture}
```

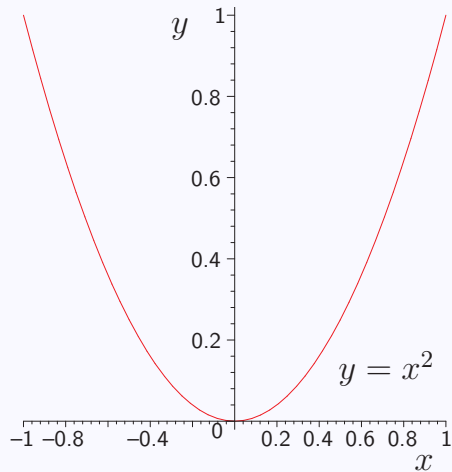
Tikz/PGF: <http://www.texample.net/tikz/examples/>

Pgfplot

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

Eps2pgf

```
\usepackage{pgf,tikz}
```



```
\begin{center}  
\input par.pgf  
\end{center}
```

<http://www.texample.net/tikz/examples/eps2pgf/>

Pspicture

```
\usepackage[pdf]{pstricks}  
\usepackage{pstricks-add}
```

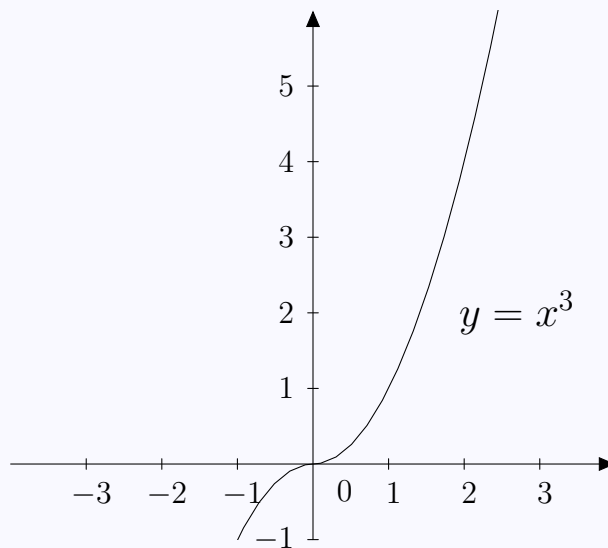
```
\psset{xunit=1.0cm,yunit=1.0cm,algebraic=true,  
dotstyle=o,dotsize=3pt 0,linewidth=0.8pt,arrowsize=3pt 2,  
arrowinset=0.25}  
\begin{pspicture*}(-4.,-1.5)(4.,6.5)  
\psaxes[xAxis=true,yAxis=true,Dx=1.,Dy=1.,  
ticksize=-2pt 0,subticks=2]{->}(0,0)(-4.,-1.)(4.,6.5)  
\rput{0.}(0.,0.){\psplot{-4.}{4.}{x^2/2/0.5}}  
\rput[t1](2.56,3.88){$y=x^2$}  
\end{pspicture*}
```

Použití s pdfL^AT_EXem:

```
pdflatex -shell-escape document.tex
```

Editor Latexdraw: <http://latexdraw.sourceforge.net/>

Geogebra



<https://www.geogebra.org/graphing>

Umožňuje export do Asymptote, Tikz i Pstricks.