

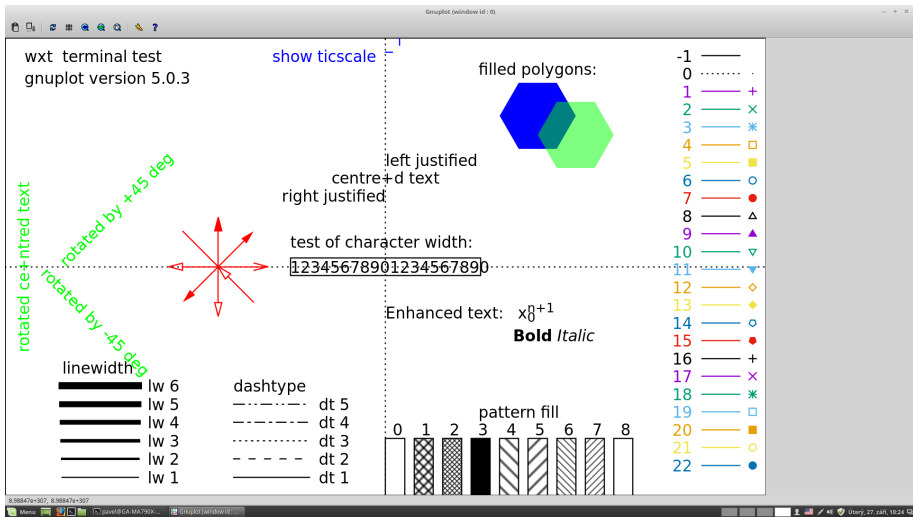
Programy

- Gnuplot
- \LaTeX
- \LaTeX -TikZ

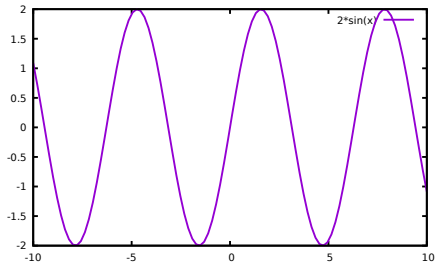
Gnuplot

- hlavní stránka: www.gnuplot.info
- dokumentace: www.gnuplot.info/documentation.html
- příklady: gnuplot.sourceforge.net/demo_5.0/
- matematické funkce
- experimentální data

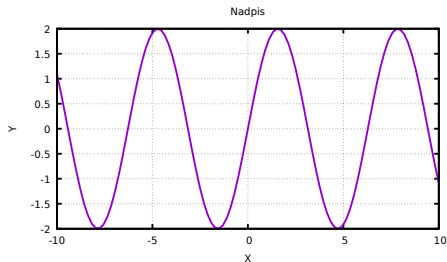
Příkaz - test



```
#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
plot 2*sin(x)
```



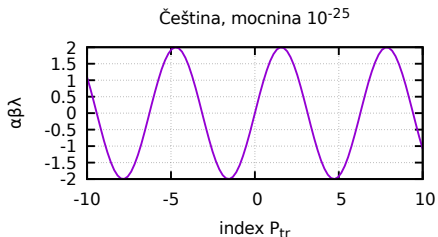
```
#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set title "Nadpis"
set xlabel "X"
set ylabel "Y"
plot 2*sin(x)
```



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,20"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set title "Čeština, mocnina 10^{-25}"
set xlabel "index P_{tr}"
set ylabel "{ /Symbol abl }"
plot 2*sin(x)

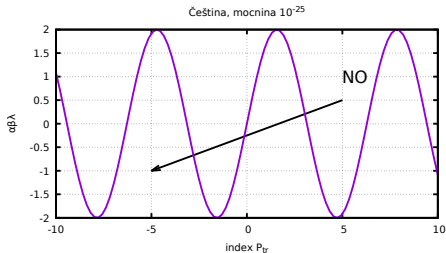
```



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set grid
set label "NO" at 5,1 font "Helvetica,20"
set arrow from 5,0.5 to -5,-1
set title "Čeština, mocnina 10-25"
set xlabel "index Ptr"
set ylabel "{ /Symbol abl }"
plot 2*sin(x)

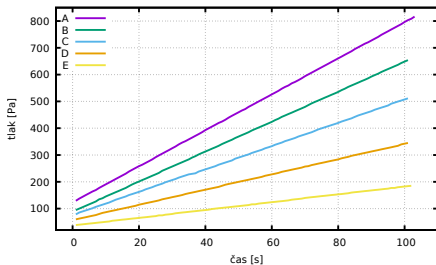
```



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,12"
set terminal pdfcairo linewidth 3
set output "test.pdf"
set grid
set xlabel "čas [s]"
set ylabel "tlak [Pa]"
set key left
set xrange [-5:110]
set yrange [20:850]
plot "VAKP5-01.DAT" using ($1):($2*133.2) title "A" with lines,/
"VAKP5-02.DAT" using ($1):($2*133.2) title "B" with lines,/
"VAKP5-03.DAT" using ($1):($2*133.2) title "C" with lines,/
"VAKP5-04.DAT" using ($1):($2*133.2) title "D" with lines,/
"VAKP5-05.DAT" u ($1):($2*133.2) t "E" w l

```

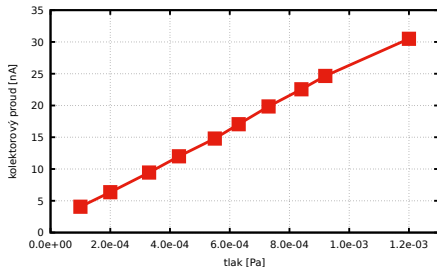



```

#!/usr/bin/gnuplot -persist
set terminal pdfcairo enhanced color solid
set terminal pdfcairo font "Helvetica,20"
set terminal pdfcairo linewidth 3
set output "test.pdf"
unset key
set xlabel "tlak [Pa]"
set ylabel "kolektorový proud [nA]"
set format x "%.1e"
le = 0.5e-3 #proud elektronu [A]

plot 'ion1.dat' using ($!*$100):($!*le*1000000000) w lp pt 5 ps
1.5 lt 7 lw 1.5

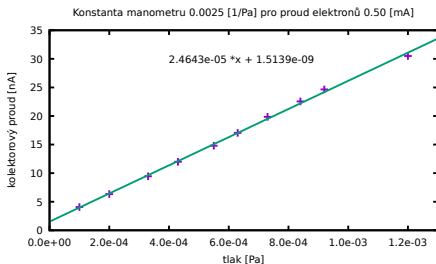
```



```

set xlabel "tlak [Pa]"
set ylabel "kolektorový proud [nA]"
unset key
set xrange [0:0.0013]
set format x "%.1e"
le = 0.5e-3
lin1(x) = a1*x+b1
a1=1
b1=1
fit lin1(x) 'ion1.dat' using ($1*100):($2*le) via a1,b1
set title sprintf("Konstanta manometru %.4f [1/Pa] pro proud
elektronů %.2f [mA]", a1*100, le*1000)
set label sprintf("%.4e *x + %.4e", K, b1) at 0.0004, 30
plot 'ion1.dat' using ($1*100):($2*le*1000000000) w p,
lin1(x)*1000000000

```



- hlavní stránka: www.latex-project.org/
- dokumentace: www.latex-project.org/help/documentation/
J. Rybička: L^AT_EX pro začátečníky, Konvoj 1995
- příklady: internet, dokumentace, ...
- článek, kniha, DP, BP, skripta, poster, přednáška, protokoly, ...
- integrovaná prostředí - TeXstudio, TeXmaker,...
- formát obrázků - png, jpg, eps, pdf

Texstudio

The screenshot displays the Texstudio interface with the following components:

- Source Code (Left Pane):**

```
\input{hlavicka.tex}

\begin{document}
%=====
\frame{
  \nadpis{Programy}
}
\begin{itemize}
  \item Gnuplot
  \item LaTeX
  \item LaTeX-TikZ
\end{itemize}
%=====
\frame{
  \nadpis{Gnuplot}
}
\begin{itemize}
  \item hlavní stránka: www.gnuplot.info
  \item dokumentace: www.gnuplot.info/documentation.html
  \item příklady: gnuplot.sourceforge.net/demo\_5.0/
\end{itemize}
}
%=====
\frame{
  \begin{columns}
    \begin{column}(0.5\textwidth)
      test
    \end{column}
    \begin{column}(0.5\textwidth)
      test
    \end{column}
  \end{columns}
}
%=====
\end{document}
```
- Rendered Output (Right Pane):**

Programy

 - Gnuplot
 - LaTeX
 - LaTeX-TikZ

PRAKTIKUM Z VAKUOVÉ FYZIKY 1 / 5

Gnuplot
- Status Bar (Bottom):** Messages Log Preview Search Results. Process started: pdflatex -synctex=1 -interaction=nonstopmode "praktikum-02a-programy".tex. Process exited normally. Pages 1 to 3 of 5, 185% zoom, cs_CZ, UTF-8, Ready, Automatic. System tray: Uspory 27, 10:12.

The image shows a screenshot of the TeXstudio application. The main editor window displays the following LaTeX code:

```
\documentclass[12pt]{article}
\begin{document}
Test
\end{document}
```

The preview window on the right shows the rendered output, which is the word "Test" in a large, black serif font centered on a white background.

At the bottom of the TeXstudio window, there is a messages panel with the following text:

```
Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex
Process exited normally
```

The status bar at the bottom right of the application shows "Page 1 of 1" and "349%". The system tray at the very bottom of the screen shows the date and time: "Pátek, 30. září 13:41".

The screenshot shows the TeXstudio interface. The left pane contains the following LaTeX source code:

```
\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage[czech]{babel}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

Test češtiny.

Test  $\lambda$ ;  $T^P$ ;  $T_{mn}$ 

\end{document}
```

The right pane shows the rendered output, which is a white page with the text:

Test češtiny.
Test λ ; T^P ; T_{mn}

At the bottom of the TeXstudio window, a Messages pane shows the following text:

Line: 19 Column: 0 INSERT
Messages Log Preview Search Results
Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex
Process exited normally

The status bar at the bottom of the TeXstudio window indicates: Page 1 of 1 349% cs_CZ UTF-8 Ready Automatic Pátek, 30. září 13:45

~/home/pavel/Pavel/Yyuka/Praktika/Programy/test.tex - TeXstudio

```

\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage[czech]{babel}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}
\begin{center}
Test  $\lambda$ ;  $T^P$ ;  $T_{mn}$ 
\end{center}


$$v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}}$$



$$v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}} \tag{1}$$


\begin{equation}
v_a = \sqrt{\frac{4}{\pi}} v_p = \sqrt{\frac{8kT}{\pi m_0}}
\end{equation}

\end{document}

```

Line: 1 Column: 0 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test" .tex
Process exited normally

Page 1 of 1 200%

cs_CZ UTF-8 Ready Automatic

TeXstudio interface showing a LaTeX document and a plot of a Maxwell-Boltzmann distribution.

```
\documentclass[12pt]{article}
\usepackage[utf8]{inputenc}
\usepackage[czech]{babel}

\usepackage{graphicx}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

\includegraphics[width= 0.8\textwidth]{v-boltz-01.pdf}

\end{document}
```

Line: 17 Column: 0 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex

Process exited normally

Page 1 of 1 141%

cs_CZ UTF-8 Ready Automatic

Pátek, 30. čer. 17:52

Teplota T=300 K, M=28, N₂

Velocity v [ms ⁻¹]	Probability Density
0	0.000000
200	0.000000
400	0.001900
600	0.001000
800	0.000400
1000	0.000100
1200	0.000020
1400	0.000000

~/home/pavel/Pavel/Vyuka/Praktika/Programy/test.tex - TeXstudio

File Edit L^aT_EX Tools Bibliography Macros View Options Help

part label tiny

test.tex

```

\usepackage{graphicx}

\pagestyle{empty}
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

Text Obr. \ref{m1} text pokračuje.

\begin{figure}[!htb]
  \begin{center}
    \includegraphics[width=0.8\textwidth]{v-boltz-01.pdf}
  \end{center}
  \caption{\em Maxwellovo rozdělení rychlostí pro dusík a
    teplotu 300 K}
  \label{m1}
\end{figure}

\end{document}

```

Line: 1 Column: 0 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test.tex"

Process exited normally

Page 1 of 1 141%

cs_CZ UTF-8 Ready Automatic

Pátek, 30. čer. 17:54

Text Obr.1 text pokračuje.

Teplota T=300 K, M=28, N₂

Obrázek 1: Maxwellovo rozdělení rychlostí pro dusík a teplotu 300 K

~/home/pavel/Pavel/Yyuka/Praktika/Programy/test.tex - TeXstudio

```

\begin{document}
\begin{table}[!ht]
\begin{center}
\begin{tabular}{|c|cccc|}
\hline
Plyn & $He$ & $Ne$ & $Ar$ & $Kr$ \\ \hline
$d [10^{-10} m]$ & 2,20 & 2,55 & 3,69 & 4,27 \\ \hline
\end{tabular}
\end{center}
\caption{\em Efektivní průměr některých atomů a molekul}
\label{prumer}
\end{table}
\end{document}

```

Plyn	<i>He</i>	<i>Ne</i>	<i>Ar</i>	<i>Kr</i>
$d [10^{-10} m]$	2,20	2,55	3,69	4,27

Tabulka 1: *Efektivní průměr některých atomů a molekul*

Line: 17 Column: 30 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test.tex"

Process exited normally

Page 1 of 1 200%

cs_CZ UTF-8 Ready Automatic

Pátek, 30. čer. 13:50

The screenshot displays the TeXstudio interface. The left pane shows the LaTeX source code for a document named 'test.tex'. The code includes margin settings, a package declaration for 'color', and a series of commands to center and size the word 'Test' in various sizes and colors. The right pane shows the rendered PDF output, where the word 'Test' is displayed in a vertical column, centered horizontally, with sizes increasing from top to bottom, and the bottom-most instance colored red.

```
\topmargin -1cm
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\usepackage{color}

\begin{document}
\begin{center}
{\tiny Test}\\
{\scriptsize Test}\\
{\footnotesize Test}\\
{\small Test}\\
{\normalsize Test}\\
{\large Test}\\
{\Large Test}\\
{\huge Test}\\
{\Huge Test}

{\color{red} Test}
\end{center}
\end{document}
```

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex

Process exited normally

Page 1 of 1 400%

cs_CZ UTF-8 Ready Automatic

The screenshot displays the TeXstudio interface. The left pane shows the LaTeX source code for a document titled 'test.tex'. The code defines a text width of 16.5cm, uses the 'color' package, and contains two lists: an itemize list with 'Test A' and 'Test B', and an enumerate list with 'Test A' and 'Test B'. The right pane shows the rendered PDF output, which features a white background with a light blue horizontal line. The rendered content consists of two bulleted items ('• Test A' and '• Test B') followed by two numbered items ('1. Test A' and '2. Test B'). The status bar at the bottom indicates 'Page 1 of 1' at 400% zoom, with system tray icons for 'cs_CZ', 'UTF-8', 'Ready', 'Automatic', and a clock showing 'Pátek, 30. čer. 16:00'.

```
\textwidth 16.5cm
\usepackage{color}
\begin{document}
\begin{itemize}
  \item Test A
  \item Test B
\end{itemize}
\begin{enumerate}
  \item Test A
  \item Test B
\end{enumerate}
\end{document}
```

• Test A
• Test B
1. Test A
2. Test B

The screenshot shows the TeXstudio interface with the following content:

```
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\begin{document}

Text \cite{test1}, text text \cite{test2}.

\begin{thebibliography}{99}
  \bibitem{test1} J. Groszkowski: Technika
  vysokého vakua, SNTL, Praha 1981
  \bibitem{test2} L. Pátý: Fyzika nízkých tlaků,
  Academia, Praha 1968
\end{thebibliography}
\end{document}
```

The rendered output on the right shows:

Text [1], text text [2].

Reference

- [1] J. Groszkowski: Technika vysokého vakua, SNTL, Praha 1981
- [2] L. Pátý: Fyzika nízkých tlaků, Academia, Praha 1968

At the bottom, a Messages window displays: "Process started: pdflatex -synctex=1 -interaction=nonstopmode 'test'.tex" and "Process exited normally". The status bar at the bottom right indicates "Page 1 of 1 165%", "cs_CZ", "UTF-8", "Ready", and "Automatic".

- hlavní stránka: www.ctan.org/pkg/pgf
- dokumentace: www.ctan.org/pkg/pgf
- příklady: www.texample.net/tikz/
- schémata

~/home/pavel/Pavel/Vyuka/Praktika/Programy/test.tex - TeXStudio

```
File Edit Latex Tools Math Wizards Bibliography Macros View Options Help
part label tiny
test.tex
\oddsidemargin -0.6cm
\textheight 24cm
\textwidth 16.5cm

\usepackage{tikz}
\begin{document}

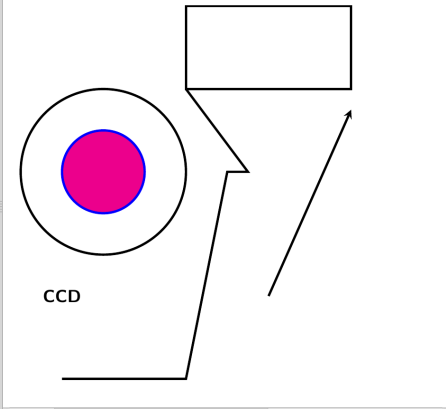
\begin{tikzpicture}[ultra thick]
\draw (2,4) rectangle (6,2);
\draw (0,0) circle (2);
\draw [fill = magenta, draw = blue] (0,0) circle (1);
\node at (-1,-3) {\bf \textsf{CCD}};
\draw [->, > = stealth] (4,-3)--(6,1.5);
\draw (-1,-5)--(2,-5)--(3,0)--(3.5,0)--(2,2);
\end{tikzpicture}
```

Line: 21 Column: 43 INSERT

Messages Log Preview Search Results

Process started: pdflatex -synctex=1 -interaction=nonstopmode "test".tex

Process exited normally



Page 1 of 1 231%

cs_CZ UTF-8 Ready Automatic

Menu [pavel@ThinkPa... ~/home/pavel/Pavel/V

Needle, 2. říjen 12:13

