

Mathplots with packages `pstricks` and `pst-plot`

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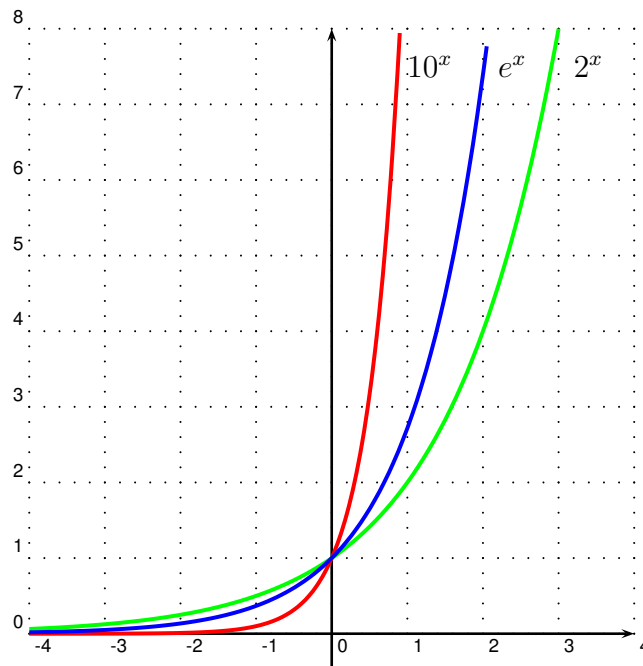
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Abstract

The following plots are produced with the packages `pst-plot.sty`¹, which is part of `pstricks`². The plot-package always requires the corresponding tex-file `pst-plot.tex`³.

In the preamble write:

```
1 \usepackage{pst-plot}
```



¹<ftp://ftp.dante.de/tex-archive/graphics/pstricks/latex/pst-plot.sty>

²<ftp://ftp.dante.de/tex-archive/graphics/pstricks/>

³<ftp://ftp.dante.de/tex-archive/graphics/pstricks/generic/>

Some Exponentialfunctions

The code for this is:

```
1 \begin{pspicture}(-4,-0.5)(4,8)
2 \psset{xunit=1cm,yunit=1cm}
3 \psgrid[subgriddiv=0,griddots=5,gridlabels=7pt](-4,-0.5)(4,8)
4 \psline[linewidth=1pt]{->}(-4,0)(+4,0)
5 \psline[linewidth=1pt]{->}(0,-0.5)(0,8)
6 \psplot[plotstyle=curve,linewidth=1.5pt]{-4}{0.9}{10 x exp}% postscript
   function
7 \rput[1](1,7.5){$10^x$}
8 \psplot[plotstyle=curve,linewidth=1.5pt]{-4}{3}{2 x exp}% postscript
   function
9 \rput[1](2.2,7.5){$e^x$}
10 \psplot[plotstyle=curve,linewidth=1.5pt]{-4}{2.05}{2.7183 x exp}%
   postscript function
11 \rput[1](3.2,7.5){$2^x$}
12 \end{pspicture}
```

The commands:

`\begin{center}` as the name says

`\begin{pspicture}(-4,-0.5)(4,8)` defines the area which is reserved for the picture, it's from the lower left to the upper right corner. Means a x-width of 8 and a y-width of 8.5

`\psset{xunit=1cm,yunit=1cm}` factor for the x and y-unit

`\psgrid[subgriddiv=1,griddots=10,gridlabels=7pt](-4,-0.5)(4,8)` the grid with a subgriddepth of 1 unit, 10 dots per grid and the labels with a size of 7pt. The grid goes from lower left to upper right of the complete pspicture-area.

`\psline[linewidth=1pt]{->}(-4,0)(+4,0)` the x-axis

`\psline[linewidth=1pt]{->}(0,-0.5)(0,8)` the y-axis

`\psplot[plotstyle=curve,linewidth=1.5pt]{-4}{0.9}{10 x exp}` plots the function 10^x for $-4 < x < 0.9$ as a curve with a linewidth of 1.5pt.

`\rput[1](1,7.5){10^x}` puts in mathmode (\dots) the function name as text beside the curve.

`\psplot[plotstyle=curve,linewidth=1.5pt]{-4}{3}{2 x exp}` plots the function 2^x for $-4 < x < 0.9$ as a curve with a linewidth of 1.5pt.

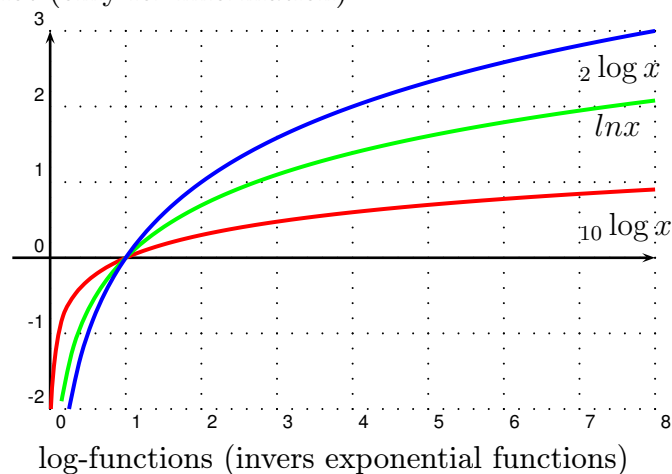
`\rput[1](2.2,7.5){e^x}` s.a.

`\psplot[plotstyle=curve,linewidth=1.5pt]{-4}{2.05}{2.7183 x exp}` plots the function e^x for $-4 < x < 0.9$ as a curve with a linewidth of 1.5pt.

`\rput[1](3.2,7.5){2^x}` s.a.

`\end{pspicture}`

Another plot (only for information).



```

1 \begin{pspicture}(-2,-5)(2,5)
2 \psset{xunit=0.0222cm,yunit=1cm}
3 \psaxes[Dx=45]{->}(0,0)(-90,-5)(90,5)
4 \uput[-90](85,0){$\bm{\alpha}$}
5 \uput[0](0,4.8){\textbf{y}}
6 \psgrid[griddots=10,%
7 subgriddiv=0,%
8 gridlabels=0pt,%
9 xunit=45](-1.5,-5)(1.5,5)
10 \psplot[plotstyle=curve,%
11 linewidth=1.5pt,%
12 linecolor=red]{-78}{78}{x sin x cos div}% postscript function
13 \end{pspicture}

```

Postscript has no own $\tan(x)$ function, therefore we have to build the quotient of $\sin(x)$ and $\cos(x)$ with `x sin x cos div`, which is:

1. build sin of angle x and put the value on stack
2. build cos of angle x and put the value on stack
3. build quotient (divide) of last two stack elements.

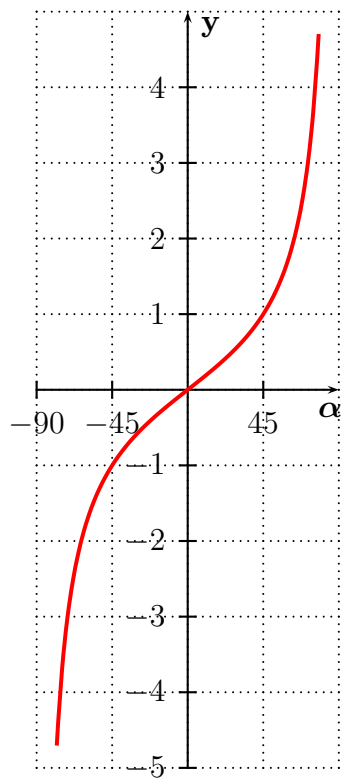


Figure 1: $\tan(x)$ function in a float