

Représentations graphiques de quelques fonctions avec Tikz & pgfplots

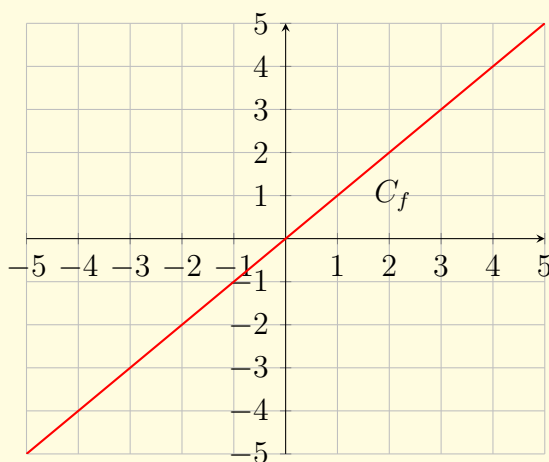
Prof: MOSAID. www.mosaaid.xyz

```
\usepackage{xcolor}
\usepackage{tikz,pgfplots}
\pgfplotsset{compat=1.18}
```

La fonction $f(x) = x$

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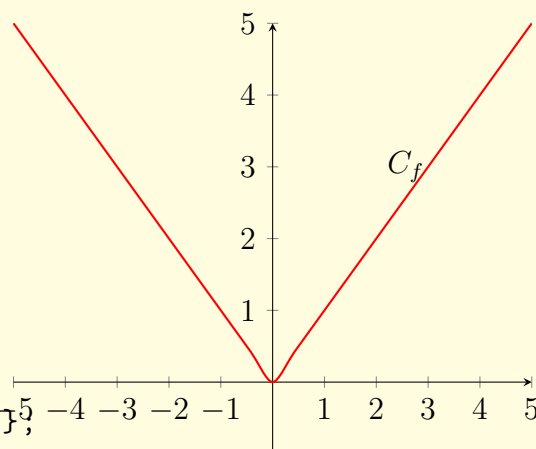
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-5, xmax=5,
    ymin=-5, ymax=5,
    xtick={-5,-4,-3,-2,-1,0,1,2,3,4,5},
    ytick={-5,-4,-3,-2,-1,0,1,2,3,4,5},
    xlabel style={below right},
    ylabel style={above left},
    grid=both
  ]
  \addplot[domain=-5:5,smooth,red,thick] {x};
  \node[right] at (axis cs: 1.5,1) {$C_f$};
\end{axis}
\end{tikzpicture}
```



La fonction $f(x) = |x|$

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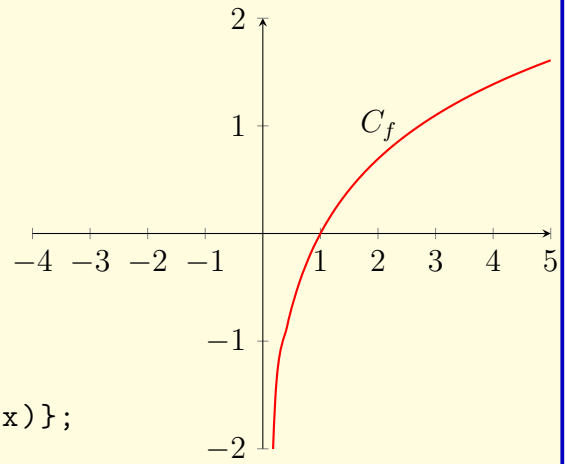
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-5, xmax=5,
    ymin=0, ymax=5,
    xtick={-5,-4,-3,-2,-1,0,1,2,3,4,5},
    ytick={0,1,2,3,4,5},
    xlabel style={below right},
    ylabel style={above left},
  ]
  \addplot[domain=-5:5,smooth,red,thick] {abs(x)};
  \node[right] at (axis cs: 2,3) {$C_f$};
\end{axis}
\end{tikzpicture}
```



La fonction $f(x) = \ln(x)$

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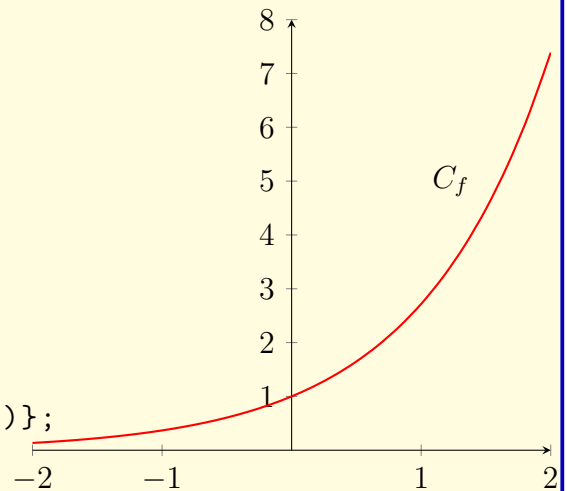
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-4, xmax=5,
    ymin=-2, ymax=2,
    xtick={-4,-3,-2,-1,0,1,2,3,4,5},
    ytick={-2,-1,0,1,2},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=0.01:5,smooth,red,thick] {\ln(x)};
    \node[right] at (axis cs: 1.5,1) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = e^x$

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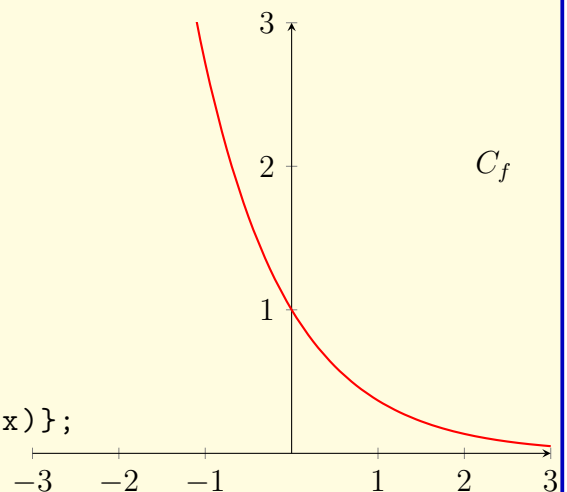
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-2, xmax=2,
    ymin=0, ymax=8,
    xtick={-2,-1,0,1,2},
    ytick={0,1,2,3,4,5,6,7,8},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2:2,smooth,red,thick] {\exp(x)};
    \node[right] at (axis cs: 1,5) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = e^{-x}$

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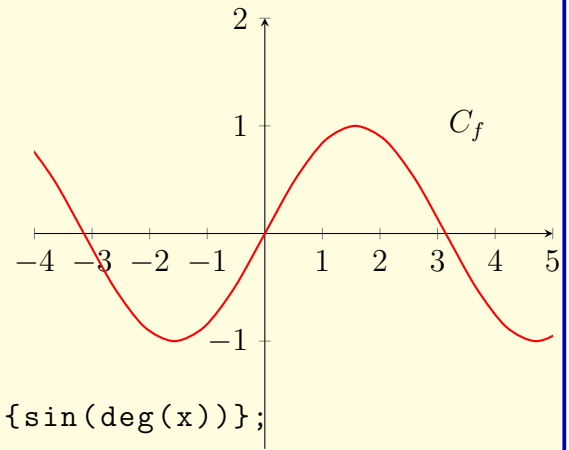
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-3, xmax=3,
    ymin=0, ymax=3,
    xtick={-3,-2,-1,0,1,2,3},
    ytick={0,1,2,3},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-3:3,smooth,red,thick] {\exp(-x)};
    \node[right] at (axis cs: 2,2) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



```

\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-4, xmax=5,
    ymin=-2, ymax=2,
    xtick={-4,-3,-2,-1,0,1,2,3,4,5},
    ytick={-2,-1,0,1,2},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2*pi:2*pi,smooth,red,thick] {sin(deg(x))};
    \node[right] at (axis cs: 3,1) {$C_f$};
  \end{axis}
\end{tikzpicture}

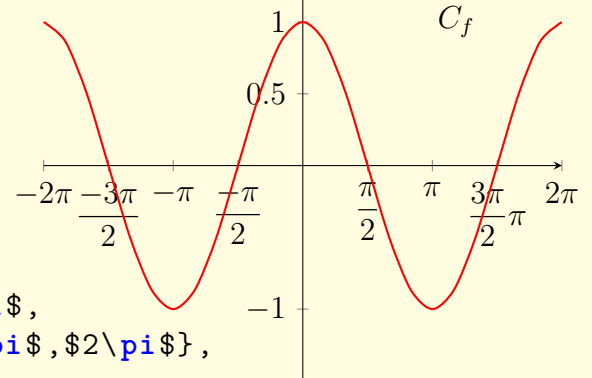
```



```

\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-2*pi, xmax=2*pi,
    ymin=-1.5, ymax=1.5,
    xtick={-2*pi,-1.5*pi,...,2*pi},
    xticklabels={
      $-2\pi$, $-\frac{3}{2}\pi$, $-\pi$, $-\frac{\pi}{2}$,
      $0$, $\frac{\pi}{2}$, $\pi$, $\frac{3}{2}\pi$, $2\pi$,
    },
    ytick={-1,-0.5,0,0.5,1},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2*pi:2*pi,smooth,red,thick] {cos(deg(x))};
    \node[right] at (axis cs: 3,1) {$C_f$};
  \end{axis}
\end{tikzpicture}

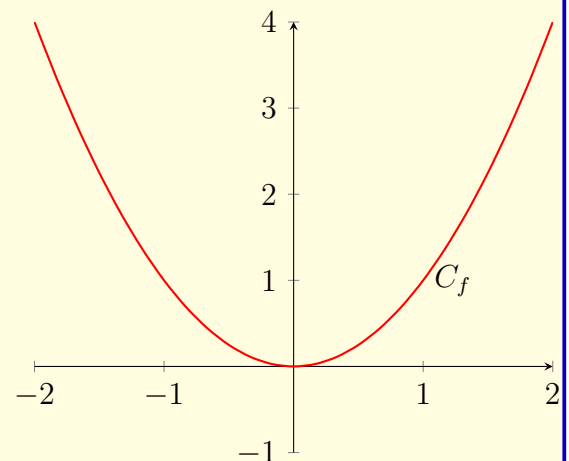
```



```

\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-2, xmax=2,
    ymin=-1, ymax=4,
    xtick={-2,-1,0,1,2},
    ytick={-1,0,1,2,3,4},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2:2,smooth,red,thick] {x^2};
    \node[right] at (axis cs: 1,1) {$C_f$};
  \end{axis}
\end{tikzpicture}

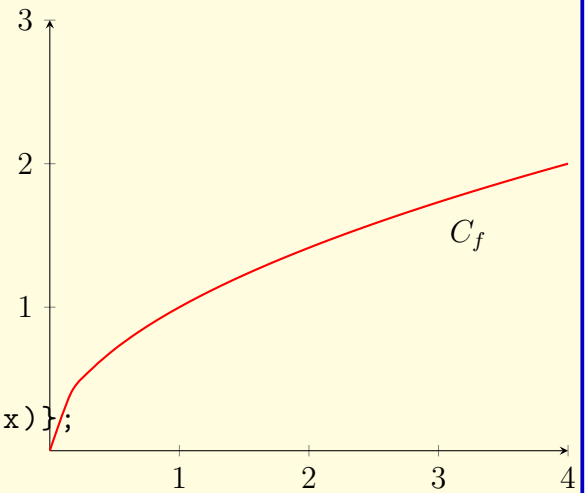
```



La fonction $f(x) = \sqrt{x}$

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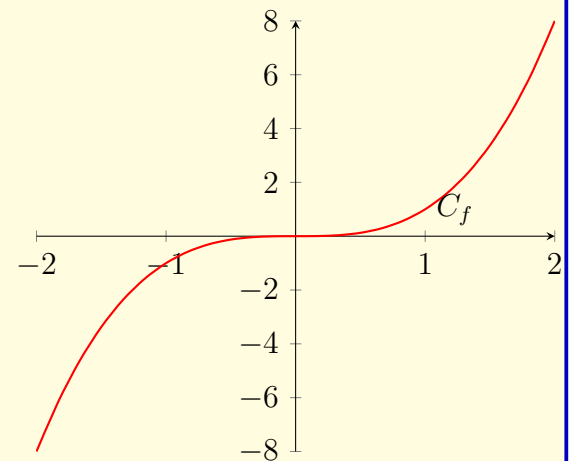
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=0, xmax=4,
    ymin=0, ymax=3,
    xtick={0,1,2,3,4},
    ytick={0,1,2,3},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=0:4,smooth,red,thick] {sqrt(x)};
    \node[right] at (axis cs: 3,1.5) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = x^3$

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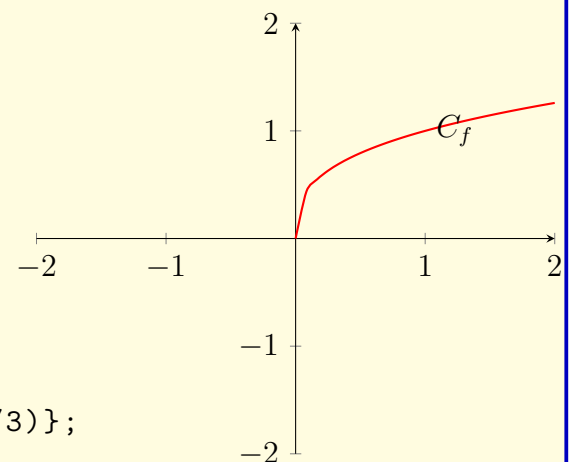
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-2, xmax=2,
    ymin=-8, ymax=8,
    xtick={-2,-1,0,1,2},
    ytick={-8,-6,-4,-2,0,2,4,6,8},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2:2,smooth,red,thick] {x^3};
    \node[right] at (axis cs: 1,1) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = \sqrt[3]{x}$

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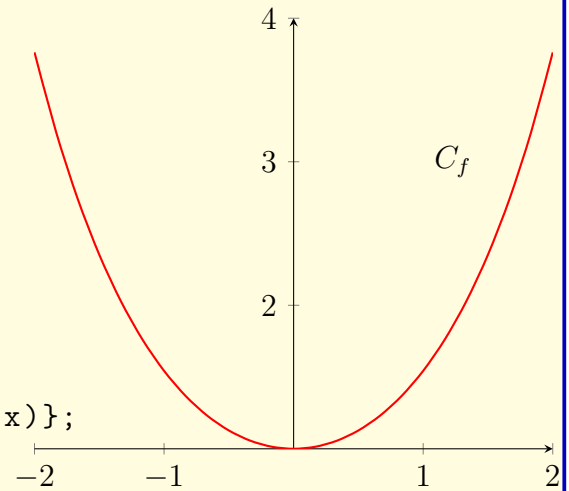
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-2, xmax=2,
    ymin=-2, ymax=2,
    xtick={-2,-1,0,1,2},
    ytick={-2,-1,0,1,2},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2:2,smooth,red,thick] {x^(1/3)};
    \node[right] at (axis cs: 1,1) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = \cosh x$

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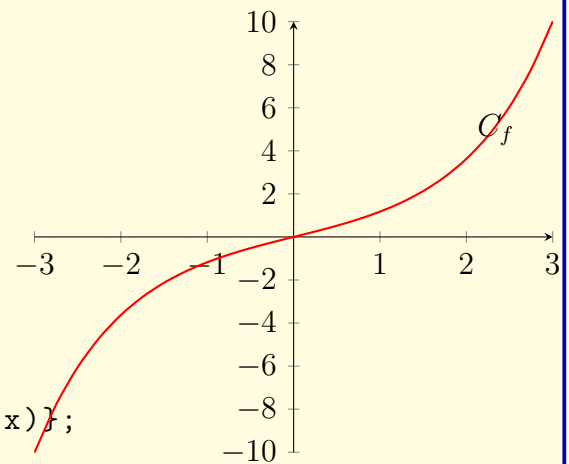
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-2, xmax=2,
    ymin=1, ymax=4,
    xtick={-2,-1,0,1,2},
    ytick={1,2,3,4},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-2:2,smooth,red,thick] {cosh(x)};
    \node[right] at (axis cs: 1,3) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = \sinh x$

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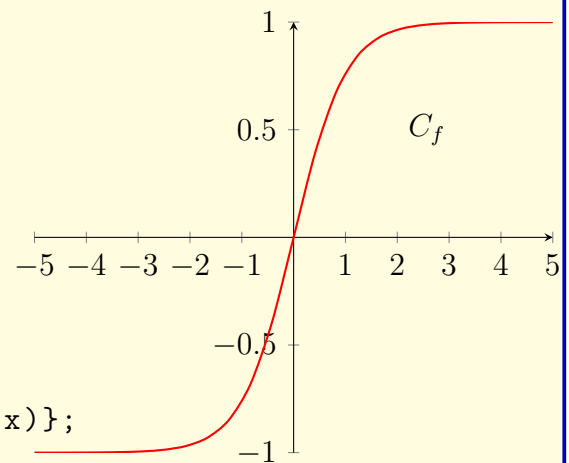
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-3, xmax=3,
    ymin=-10, ymax=10,
    xtick={-3,-2,-1,0,1,2,3},
    ytick={-10,-8,-6,-4,-2,0,2,4,6,8,10},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-3:3,smooth,red,thick] {sinh(x)};
    \node[right] at (axis cs: 2,5) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



La fonction $f(x) = \tanh x$

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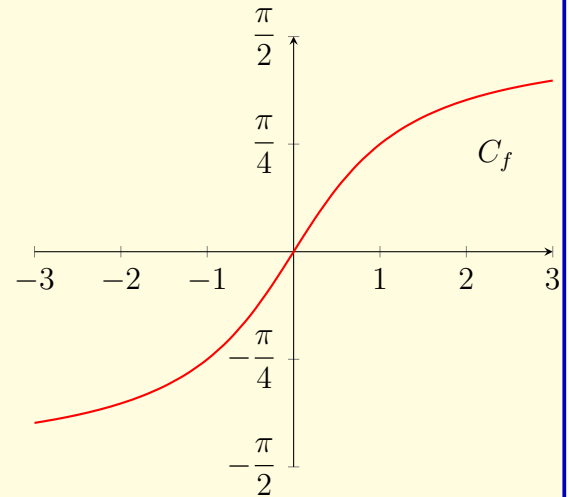
```
\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-5, xmax=5,
    ymin=-1, ymax=1,
    xtick={-5,-4,-3,-2,-1,0,1,2,3,4,5},
    ytick={-1,-0.5,0,0.5,1},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-5:5,smooth,red,thick] {tanh(x)};
    \node[right] at (axis cs: 2,0.5) {$C_f$};
  \end{axis}
\end{tikzpicture}
```



```

\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-3, xmax=3,
    ymin=-pi/2, ymax=pi/2,
    xtick={-3,-2,-1,0,1,2,3},
    ytick={-1.57, -0.785, 0, 0.785, 1.57},
    yticklabels={\frac{\pi}{2}},
    {\frac{\pi}{4}}, {0},
    {\frac{\pi}{4}}, {\frac{\pi}{2}},
    xlabel style={below right},
    ylabel style={above left},
  ]
    \addplot[domain=-3:3,smooth,red,thick] {rad(atan(x))};
    \node[right] at (axis cs: 2,0.7) {$C_f$};
  \end{axis}
\end{tikzpicture}

```



```

\begin{tikzpicture}
  \begin{axis}[
    axis lines=middle,
    xmin=-5, xmax=5,
    ymin=-5, ymax=5,
    xtick={-4,-3,-2,-1,0,1,2,3,4,5},
    ytick={-4,-3,-2,-1,0,1,2,3,4,5},
    xlabel style={below right},
    ylabel style={above left},
  ]
  \end{axis}
\end{tikzpicture}

```

