Plotting Bessel functions

This simple example uses Mathematica to produce a plot of the first six Bessel functions. Two plots are shown, one created by Mathematica and a second created by LaTeX using the plotting package `pgfplots` and the data exported from Mathematica.

```
myData = Partition[Flatten[Table[{x, Table[BesselJ[n, x], {n, 0, 5}]}, {x, 0, 15, 0.1}]], 7];
myPlot = Plot[Evaluate[Table[BesselJ[n, x], {n, 0, 5}]], {x, 0, 15}, PlotLegends -> "Expressions"];

Export["example-04-fig.png", myPlot, "PNG"];
Export["example-04-fig.pdf", myPlot, "PDF"];
Export["example-04.txt", myData, "Table",  "FieldSeparators" -> " "];
```

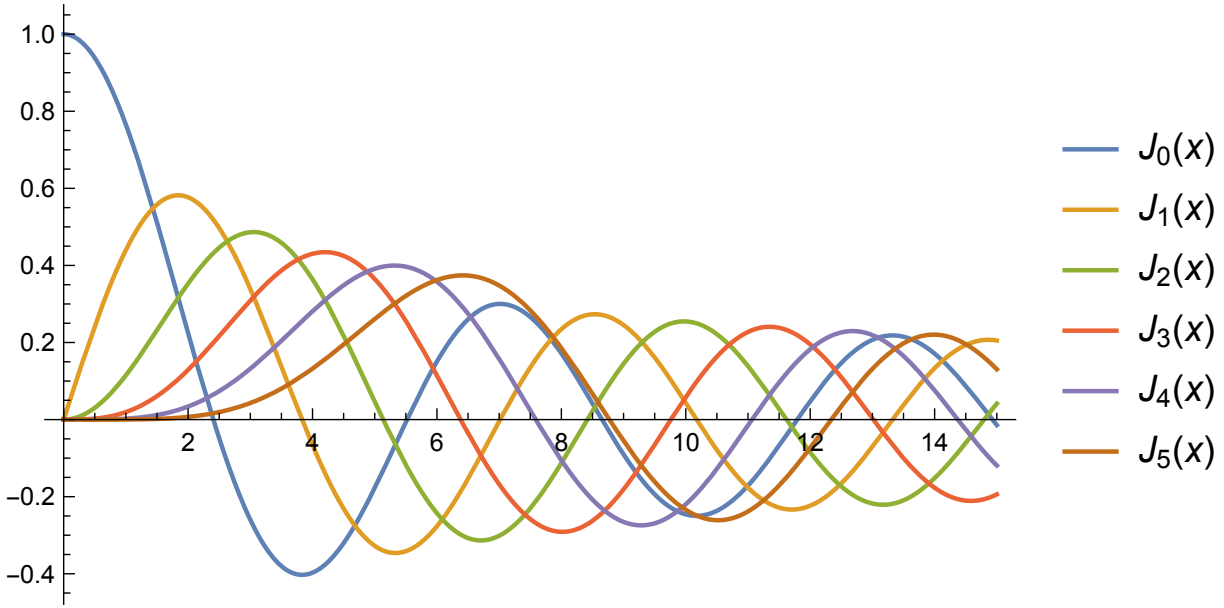

Figure 1: The first six Bessel functions.

Using pgfplots

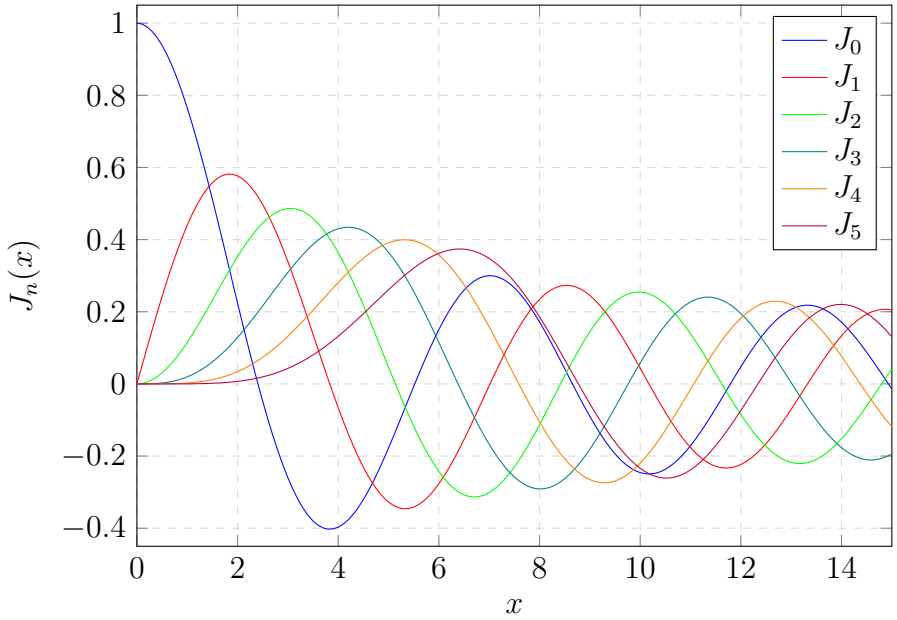

Figure 2: The first six Bessel functions.

```
\begin{tikzpicture} % requires \usepackage{pgfplots}
   \begin{axis}
      [xmin= 0.0,  xmax=15.0,
       ymin=-0.45, ymax=1.05,
       xlabel=$x$, ylabel=$J_n(x)$,
       grid=major, grid style={dashed,gray!30},
       legend entries = {$J_0$, $J_1$, $J_2$, $J_3$, $J_4$, $J_5$}]
       \addplot[blue]   table [x index=0, y index=1]{example-04.txt};
       \addplot[red]    table [x index=0, y index=2]{example-04.txt};
       \addplot[green]  table [x index=0, y index=3]{example-04.txt};
       \addplot[teal]   table [x index=0, y index=4]{example-04.txt};
       \addplot[orange] table [x index=0, y index=5]{example-04.txt};
       \addplot[purple] table [x index=0, y index=6]{example-04.txt};
   \end{axis}
\end{tikzpicture}
\captionof{figure}{The first six Bessel functions.} % requires \usepackage{caption}
```