## Plotting Bessel functions

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

This example is based upon the Mathworks example at https://au.mathworks.com/matlabcentral/fileexchange/35229-matlab-plot-gallery-standard-line-colors.

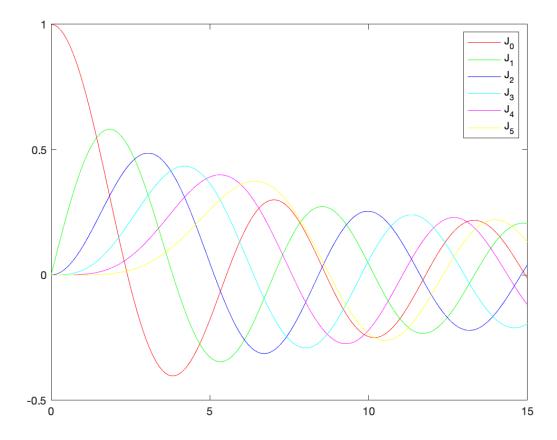


Figure 1: The first six Bessel functions.

## Using pgfplots

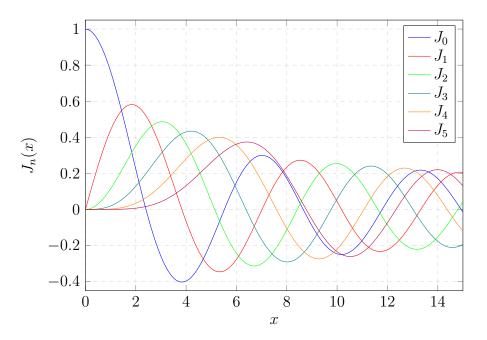


Figure 2: The first six Bessel functions.

```
\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 = {$J_0$, $J_1$, $J_2$, $J_3$, $J_4$, $J_5$}]
                       table [x index=0, y index=1]{example_04.txt};
      \addplot[blue]
      \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}
```