# 1 Matlab's Bessel Tools

First let's see if we can get some plots of the Bessel Function. Matlab provides several functions that solve Bessel's differential equation. A list from the help yields

BESSELJ(NU,Z) - Bessel function of the first kind
BESSELY(NU,Z) - Bessel function of the second kind
BESSELI(NU,Z) - Modified Bessel function of the first kind
BESSELK(NU,Z) - Modified Bessel function of the second kind
BESSELH(NU,K,Z) - Hankel function
AIRY(K,Z) - Airy function

## 1.1 Bessel function of the first kind

The NU argument is the order of the Bessel function and is a real number. The domain of the function is the argument Z and is a complex number. This makes plotting with BESSELJ quite simple, for $J_\nu(Z)$ where $\nu = -2, -1, 0, 1, 2$