Exercise 1 (8 points)
Find the indicial roots of the power series solutions of the differential equation \(3xy'' + (2 - x)y' - y = 0\).

Exercise 2 (12 points)
Find the eigenvalues and eigenvectors for the matrix \(A = \begin{pmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 4 & 0 & 1 \end{pmatrix}\).
Exercise 1 (12 points)

Find the eigenvalues and eigenvectors for the matrix

\[ B = \begin{pmatrix} 0 & 4 & 0 \\ -1 & -4 & 0 \\ 0 & 0 & -2 \end{pmatrix} \]

Exercise 2 (8 points)

Find the indicial roots of the power series solutions of the differential equation

\[ 3xy'' + (2 - x)y' - y = 0 \]