1. Use Maple to find the 1st and 3rd rows of A, as well as the last two columns of A.

\[ A := \begin{bmatrix} 2 & 1 & -1 & 2 \\ 1 & 2 & 3 & 1 \\ -1 & 3 & 2 & 1 \\ 2 & 1 & 1 & 2 \end{bmatrix} \]

2. Use Maple to find the determinant, the characteristic polynomial, and eigenvalues of the A given above.

3. Given the matrix B below, use Maple to find A+B, (A+B)\( ^T \), AB, (AB)\(^{-1} \) where.

\[ B := \begin{bmatrix} 1 & 1 & -1 & 3 \\ 1 & 1 & 2 & 1 \\ 4 & 1 & 2 & 1 \\ 2 & 1 & 1 & -2 \end{bmatrix} \]

4. Using the matrix A above as the coefficient matrix and \( b := \begin{bmatrix} 1 \\ 2 \\ 1 \\ 3 \end{bmatrix} \), use maple to solve the resulting system of equations by 1) using elimination and then back substitution, 2) Gauss-Jordan elimination, 3) LU-decomposition (use maple’s forward and back substitutions.)

5. Calculate the cost of solving an \( n \times n \) system of linear equations using the Gauss-Jordan process of elimination, (Reduced Row Echelon Form).

\[ \begin{cases} u + v + w = -2 \\ 3u + 3v - w = 6 \\ u - v + w = -1 \end{cases} \]

6. Consider the system: \( \begin{cases} u + v + w = -2 \\ 3u + 3v - w = 6 \\ u - v + w = -1 \end{cases} \), use maple to explain the geometry of the solution of the system.