1. Calculate explicitly (by hand or using symbolic math software) the polynomial pieces that make up the cardinal spline \( B_3 = B_1 * B_1 * B_1 \).

2. Compute all eigenvectors and the spectral radius of the transfer operator for the 3rd Daubechies scaling function coming from the expansion of

\[
\left( \cos^2(\omega/2) + \sin^2(\omega/2) \right)^5.
\]

How many derivatives of this function are in \( L^2 \)?