$$
\begin{aligned}
\psi(A) &= a_1^1 b_1^1 + a_1^2 b_2^1 + a_1^1 b_1^2 + a_1^2 b_2^2 + a_2^1 b_1^1 + a_2^2 b_2^1 + a_2^1 b_1^2 + a_2^2 b_2^2 \\
\psi(V) &= a_1^1 b_1^1 + a_1^2 b_2^1 - a_1^1 b_1^2 - a_1^2 b_2^2 + a_2^1 b_1^1 + a_2^2 b_2^1 - a_2^1 b_1^2 - a_2^2 b_2^2 \\
\psi(H) &= a_1^1 b_1^1 + a_1^2 b_2^1 + a_1^1 b_1^2 + a_1^2 b_2^2 - a_2^1 b_1^1 - a_2^2 b_2^1 - a_2^1 b_1^2 - a_2^2 b_2^2 \\
\psi(D) &= a_1^1 b_1^1 + a_1^2 b_2^1 - a_1^1 b_1^2 - a_1^2 b_2^2 - a_2^1 b_1^1 - a_2^2 b_2^1 + a_2^1 b_1^2 + a_2^2 b_2^2
\end{aligned}
$$