A Noble Derivation of Polynomial Multiplication Rules

\[(a+b)^2 \text{ is given as } (a^2+b^2) \text{ in field } \mathbb{R}: \]

\[
\left( \begin{array}{c}
A \\
A \\
\end{array} \right) + \left( \begin{array}{c}
B \\
B \\
\end{array} \right) = \left( \begin{array}{c}
A \\
A \\
\end{array} \right) + \left( \begin{array}{c}
B \\
B \\
\end{array} \right)^2
\]