$$(x^2 + x + 1) \times (x - 2) = x^3 - x^2 - x - 2$$

$$\begin{pmatrix}2\\1\\0\end{pmatrix} \text{ with } \begin{pmatrix}1\\x\\x^2\end{pmatrix} = x+2$$

$$\begin{pmatrix}1\\1\\1\end{pmatrix} \text{ with } \begin{pmatrix}1\\x\\x^2\end{pmatrix} = x^2+x+1 \qquad = 2x^2+2x+4$$

$$\begin{pmatrix}3\\0\\1\end{pmatrix} \text{ with } \begin{pmatrix}1\\x\\x^2\end{pmatrix} = x^2+1$$

$$3x^2 + 2x + 1$$

$$
\begin{array}{lcr}
a & & 5x^2 + 15x + 10 \\
s & \times & 2x^2 - 4x + 2 \\
e & + & -x^2 + x - 2 \\
\hline
b & = & -10x^2 + 9x + 6
\end{array}
$$