Yuan Gao z5239220 Q5

Find the sequence x satisfying $x * \langle 1, 1, -1 \rangle = \langle 1, 0, -1, 2, -1 \rangle$

Assume that,
$$X * x^2 + x^1 - 1 = x^4 + 0 \cdot x^3 - x^2 + 2x^1 - 1$$

We can do the division

$$
\begin{array}{r}
x^2 - x^1 + 1 \\
\hline
x^2 + x^1 - 1 \, \big) \, x^4 + 0x^3 - x^2 + 2x - 1 \\
x^4 + x^3 - x^2 \\
\hline
-x^3 + 0x^2 + 2x - 1 \\
-x^3 - x^2 + x \\
\hline
x^2 + x - 1 \\
x^2 + x - 1 \\
\hline
0
\end{array}
$$

Therefore, the sequence x is $\langle 1, -1, 1 \rangle$