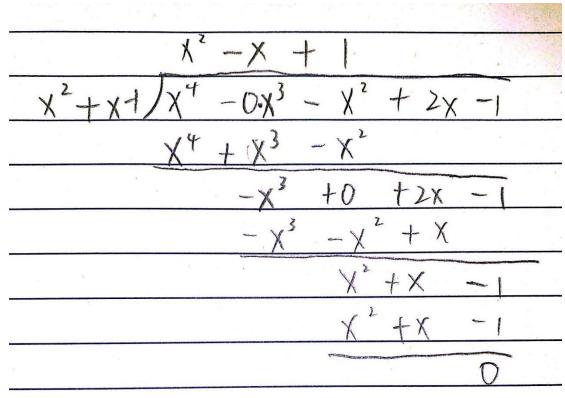Q5:

Given the equation $x* <1,1,-1>=<1,0,-1,2,-1>$

Find out the value of x

Solve:

On the left hand side, the coefficient of polynomial <1,1,-1> can be represented as $x^2 + x - 1$. On the right hand side, the coefficient of polynomial <1,0,-1,2,-1> can be represented as $x^4 - x^2 + 2x - 1$. So that we can implemented the long polynomial division

$$
\begin{array}{r}
x^2 - x + 1 \\
x^2 + x - 1 \overline{\smash{\big)}\ x^4 - 0\cdot x^3 - x^2 + 2x - 1} \\
\underline{x^4 + x^3 - x^2} \\
-x^3 + 0 + 2x - 1 \\
\underline{-x^3 - x^2 + x} \\
x^2 + x - 1 \\
\underline{x^2 + x - 1} \\
0
\end{array}
$$

So that the answer should be "x" = $x^2 - x + 1$