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Question 5:

- Let define polynomial $P(x)$ is the corresponding polynomial for sequence x .
- Let define sequence $A = \langle 1, 1, -1 \rangle$ and the corresponding polynomial $P_A(x) = 1 + x - x^2$
- Let define sequence $C = \langle 1, 0, -1, 2, -1 \rangle$ and the corresponding polynomial
$$P_C(x) = 1 - x^2 + 2x^3 - x^4$$
- As we know $x * A = C$ is corresponding to $P(x)P_A(x) = P_C(x)$
- Our goal is to find the polynomial $P(x)$.
- Using polynomial long division technique, we can find polynomial $P(x)$ as below:

$$P(x) = \frac{P_C(x)}{P_A(x)}$$
$$P(x) = \frac{1 - x^2 + 2x^3 - x^4}{1 + x - x^2}$$
$$P(x) = x^2 - x + 1$$

- From polynomial $P(x)$, we can conclude that the sequence x is:
$$\langle 1, -1, 1 \rangle$$