

NCERT DISCRETE

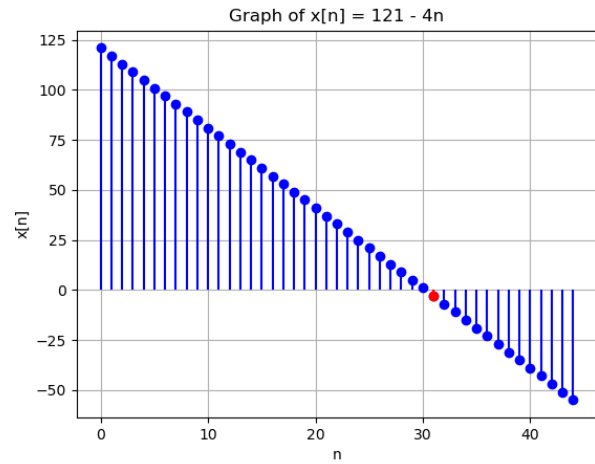
EE23BTECH11214 - Harsha Vardhan Paramata*

Question 10.5.4.1: Which term of the AP: 121, 117, 113, ..., is its first negative term?

Solution:

| Symbol | Description | Value |
|--------|-------------------|------------|
| $x[n]$ | General term | $121 - 4n$ |
| $x[z]$ | Initial term | 121 |
| d | Common difference | 4 |

TABLE 0
PARAMETERS LIST



$$x[n] = 121 - 4n < 0 \quad (1)$$

$$n > \frac{121}{4} \quad (2)$$

The first negative term in the sequence occurs at $n = 31$

Z-transform of this sequence:

$$X(z) = \frac{121 - 125z^{-1}}{1 - 2z^{-1} + z^{-2}}, \quad |z| > 1 \quad (3)$$