Assignment

EE23BTECH11001 - Aashna Sahu

Q:Check whether -150 is a term of the AP: 11,8,5,2,....

Solution: Let nth term of given AP be $x(n)$

Given:

First term,$x(0) = 11$ and Common difference,$d = -3$

$$x(n) = x(0) + nd \tag{1}$$

$$n = \frac{x(n) - x(0)}{d} \tag{2}$$

For $n \in N$

$$x(n) - x(0) \equiv 0 \pmod{d} \tag{3}$$

On substitutings values

$$-161 \equiv 2 \pmod{-3} \tag{4}$$

As $n \notin N$

Thus -150 is not a term of the given AP.

$$\boxed{x(n) = (11 - 3n) \times u(n)} \tag{5}$$

$$\boxed{X(z) = x(0)U(z) - dz\frac{d(U(z))}{dz}} \tag{6}$$

$$X(z) = 11U(z) - 3\left(-z\frac{d(U(z))}{dz}\right) \tag{7}$$

$$X(z) = \frac{11}{1 - z^{-1}} - \frac{3z^{-1}}{(1 - z^{-1})^2} \text{ ROC: } |z| > 1 \tag{8}$$

Variable	Description	Value
$x(0)$	First term of AP	11
d	Common difference	-3
$x(n)$	General term of given AP	None

TABLE 0: Input parameters

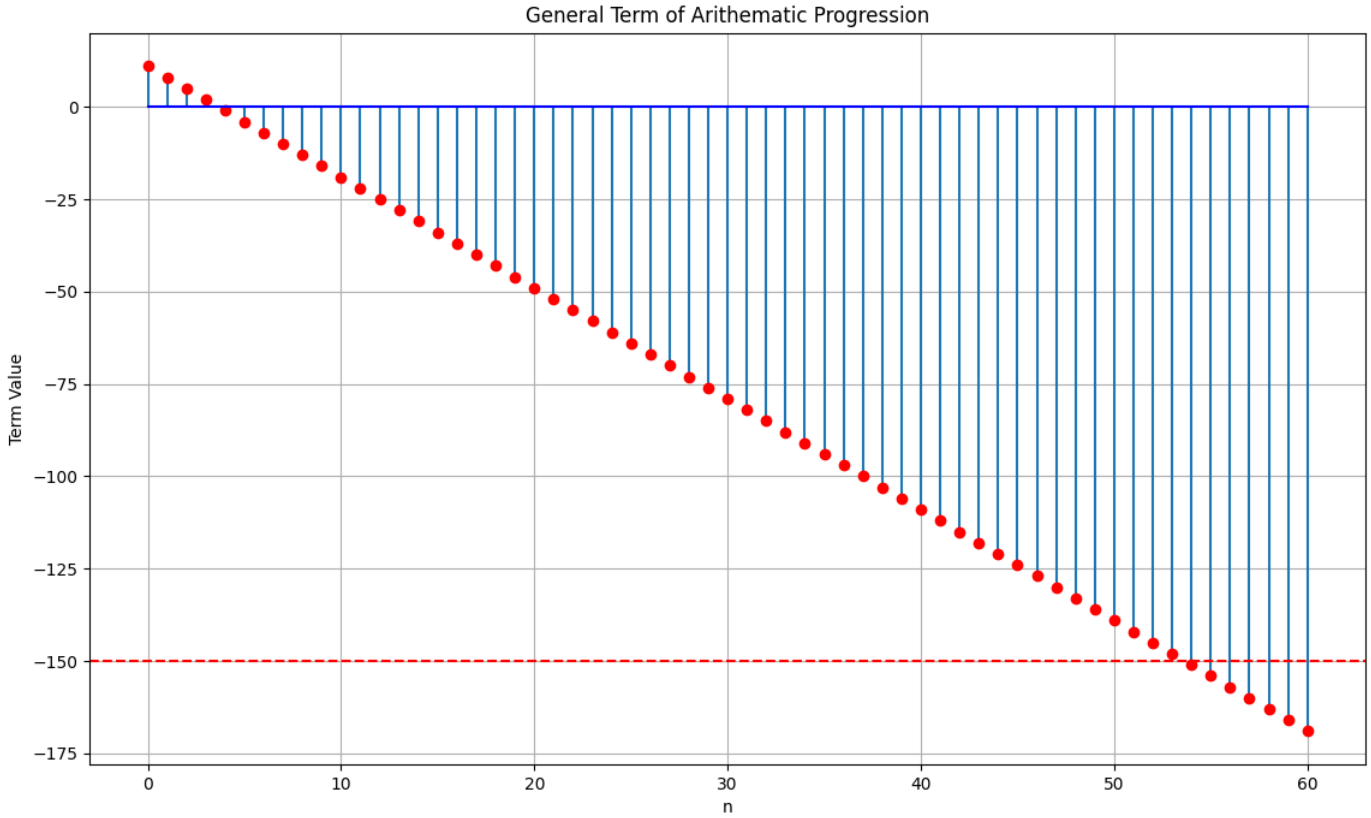

Fig. 0: Representation of x(n)