Assignment

11.9.1 - 9

EE23BTECH11220 - R.V.S.S Varun

Question

Find a_9 in the sequence $a_n = (-1)^{n-1}\, n^3$

Solution

Symbol	Value	Description
x(0)	1	First term of the sequence
x(n)	$(-1)^n\,(n+1)^3\,u(n)$	$(n+1)^{th}$ term of the sequence

TABLE 0
Table of parameters

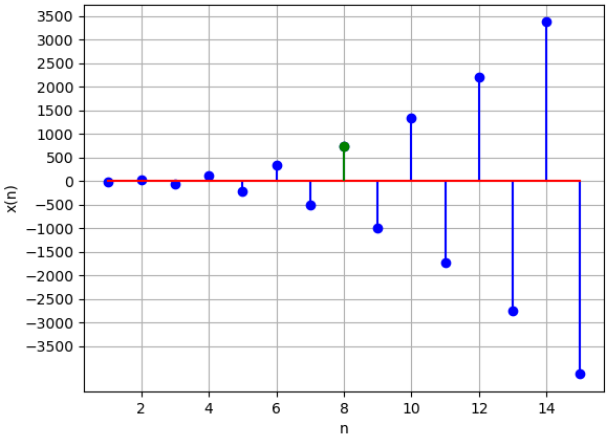
To obtain 9^{th} term of the sequence put n=8 in x(n)

$$x(8) = 729 \tag{1}$$

Using Z transform,

$$X(z) = \sum_{n=-\infty}^{n=\infty} (-1)^n \cdot (n+1)^3 \cdot u(n) \cdot z^{-n} \tag{2}$$

$$X(z) = \frac{z^{-1}\left(1 + 4z^{-1} + z^{-2}\right)}{\left(1 - z^{-1}\right)^4} \quad \{z : |z| > 1\} \tag{3}$$



Graph of x(n)