

EE23BTECH11208 - Manohar K*

EXERCISE 9.2

14. Insert five numbers between 8 and 26 such that the resulting sequence is an A.P. and obtain the Z-transform of the sequence.

Solution: Given,

symbol	value	description
$x(0)$	8	first term of the series
$x(6)$	26	last term of the series
N	$2 + 5 = 7$	number terms in the series

TABLE I
PARAMETERS

$$d = \frac{x(6) - x(0)}{N - 1}, \quad (1)$$

$$= 3 \quad (2)$$

$$x(n) = [x(0) + nd]u(n) \quad (3)$$

the A.P. sequence is:

$$8, 11, 14, 17, 20, 23, 26 \quad (4)$$

using eq (??),

$$\Rightarrow X(z) = \frac{8}{1 - z^{-1}} + \frac{3z^{-1}}{(1 - z^{-1})^2} \quad \{ROC : z \neq 1\} \quad (5)$$

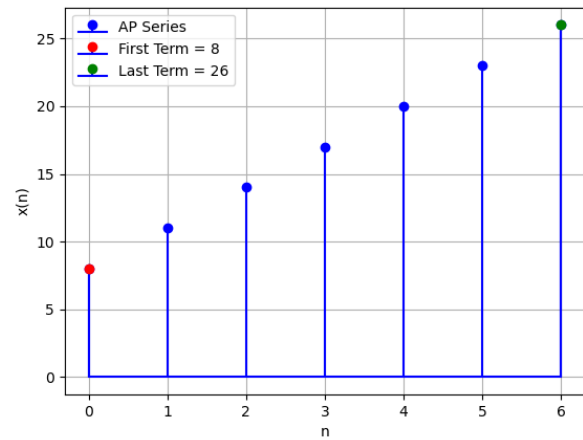


Fig. 1. Plot of x(n) vs n