

NCERT 10.5.2 17Q

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Question: Find the 20th term from the last term of the AP: 3, 8, 13.....253.

Solution:

As the 20th term is considered from last,

Parameter	Description	Value
$x(0)$	first term	3
d	common difference	$8 - 3 = 5$
$x(N)$	$(N + 1)^{th}$ term	$x(0) + Nd$
$x(n)_{last}$	$(n + 1)^{th}$ term from last	$x(0) + (N - n)d$

TABLE 1: Input table

From Table 1:

$$253 = 3 + 5N \quad (1)$$

$$250 = 5N \quad (2)$$

$$N = 50 \quad (3)$$

From Table 1:

$$x(19) = 3 + (50 - 19)(5) \quad (4)$$

$$= 3 + 155 \quad (5)$$

$$= 158 \quad (6)$$

From equation (??) and (??): Z-Transform of $x(N)$:

$$X(z) = \frac{3}{1 - z^{-1}} + \frac{5z^{-1}}{(1 - z^{-1})^2}; \{z \in \mathbb{C} : |z| > 1\} \quad (7)$$

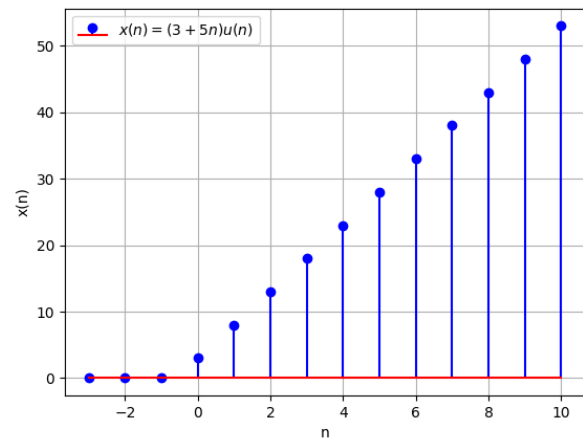


Fig. 1