NCERT 10.5.2 17Q

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Question: Find the 20^{th} 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	$x(0)+(n-k)d$

TABLE 1: Input table

From Table 1:

$$253 = 3 + 5n \tag{1}$$

$$250 = 5n \tag{2}$$

$$n = 50 \tag{3}$$

From Table 1:

$$x(19) = 3 + (50-19)(5) \tag{4}$$

$$= 3 + 155 \tag{5}$$

$$= 158 \tag{6}$$

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

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

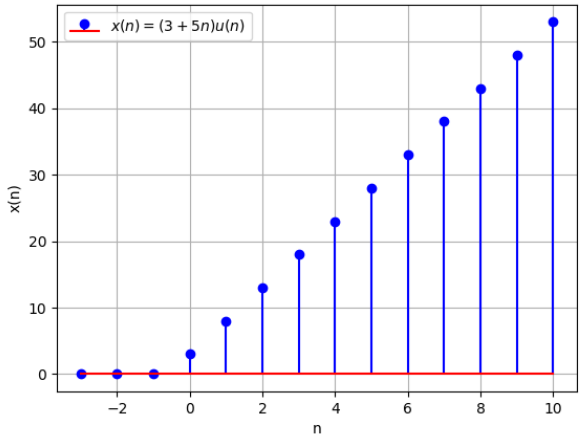

Fig. 1