

NCERT 11.9.3 1Q

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Question: Find the 20th and n^{th} terms of the G.P $\frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \dots$

Solution:

Parameter	Description	Value
$x(0)$	First Term	$\frac{5}{2}$
$r = \frac{x(1)}{x(0)}$	Common Ratio	$\frac{1}{2}$
$x(n)$	n^{th} Term	$\frac{5}{2} \left(\frac{1}{2}\right)^n \cdot u(n)$
$x(19)$	20 th Term	$\frac{5}{2} \left(\frac{1}{2}\right)^{19}$
$u(n)$	Unit step function	

TABLE 1: Parameters

From Table 1: Z-Transform of $x(n)$:

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

(1)

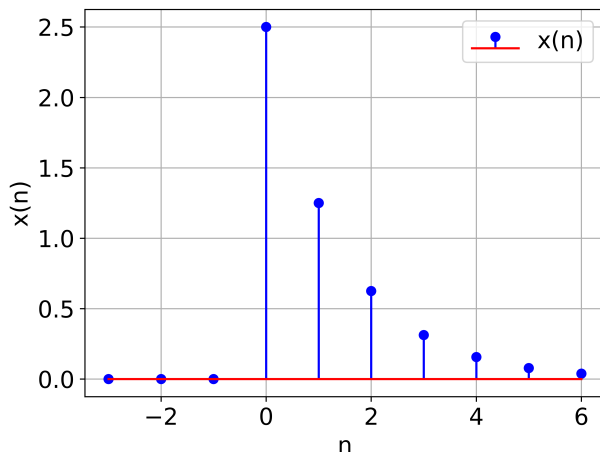


Fig. 1