

NCERT Mathematics 10.5.2 Q10

EE23BTECH11213 - MUTHYALA NIKHITHA SRI

Question: The 17th term of an AP exceeds its 10th term by 7. Find the common difference.

Solution:

Parameter	Description	Value
d	Common difference of AP	?
$x(n)$	General term of an AP	$(x(0) + (n)d)u(n)$
$x(16) - x(9)$	The difference between 17th and 10th term of AP	?

TABLE I
INPUT PARAMETERS

$$(x(0) + 16d) - (x(0) + 9d) = 7 \quad (1)$$

$$\implies d = 1 \quad (2)$$

Z transform of $x(n)$ is

$$X(z) = x(0) \cdot \frac{1}{1 - z^{-1}} + \frac{z^{-1}}{(1 - z^{-1})^2} \quad |z| > 1 \quad (3)$$

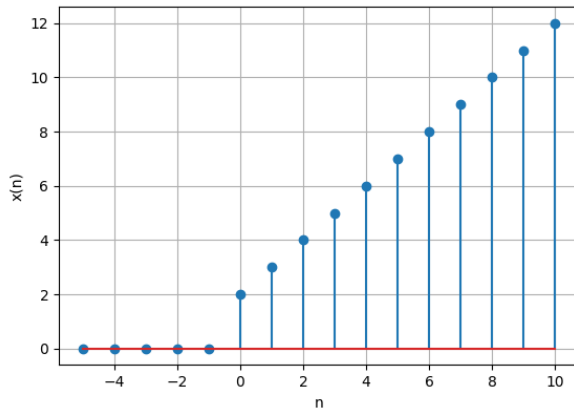


Fig. 1. Stem plot of $x(n)$ for $x(0) = 2$