NCERT Discrete 11.9.1 Q7

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Question: Find the indicated terms in the sequence whose nth terms is $a(n) = 4n-3$. Find $a(17)$ and $a(24)$.

Solution: In the question, following information is provided:

Symbol	Value	Description
$x(n)$	$(4n+1)u(n)$	The nth term of the sequence
$x(17)$	?	17th term
$x(24)$	?	24th term

TABLE I
PARAMETERS

As series starts from n=0

$$x(n) = a(n+1) \tag{1}$$

$$x(n) = (4n+1)\,u(n). \tag{2}$$

$$x(16) = a(17) \tag{3}$$

$$x(16) = 4 \times 16 + 1 = 65 \tag{4}$$

$$x(23) = a(24) \tag{5}$$

$$x(23) = 4 \times 23 + 1 = 93 \tag{6}$$

$$X(z) = \sum_{n=-\infty}^{\infty} x[n] \cdot z^{-n} \tag{7}$$

From (7) we get,

$$X(z) = 4\frac{z^{-1}}{(1-z^{-1})^2} + \frac{1}{1-z^{-1}} \quad |z| > 1 \tag{8}$$

The plot between $x(n)$ and n is :

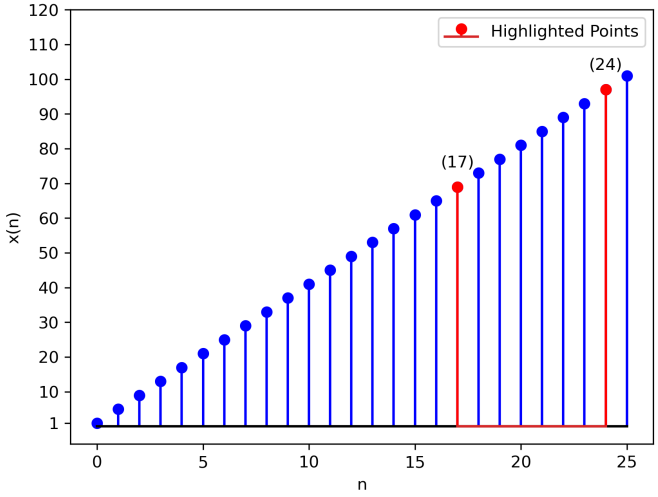

Fig. 1. $x(n)$ vs n