EE23BTECH11054 - Sai Krishna Shanigarapu*

Exercise 9.2

13 If the sum of n terms of an A.P. is $3n^2 + 5n$ and its m^{th} term is 164, find the value of m.

Solution:

$$y(n) = 3(n+1)^2 + 5(n+1) \tag{1}$$

$$Y(z) = \frac{2z^2(4z-1)}{(z-1)^3} \tag{2}$$

$$U(z) = \frac{1}{1-z^{-1}} \tag{3}$$

$$y(n) = x(n) * u(n) \tag{4}$$

$$X(z) = \frac{Y(z)}{U(z)} \tag{5}$$

$$= \frac{8-2z^{-1}}{(1-z^{-1})^2} \tag{6}$$

$$x(n) = Z_z^{-1}[X(z)] \tag{7}$$

$$= (6n+8)(u(n)) \tag{8}$$

Symbol	Parameters
$y(n)$	Sum of n terms
$x(n)$	general term
$u(n)$	unit step function
$Y(z)$	Z-transform of $y(n)$
$X(z)$	Z-transform of $x(n)$
$U(z)$	Z-transform of $u(n)$

TABLE I
Parameters

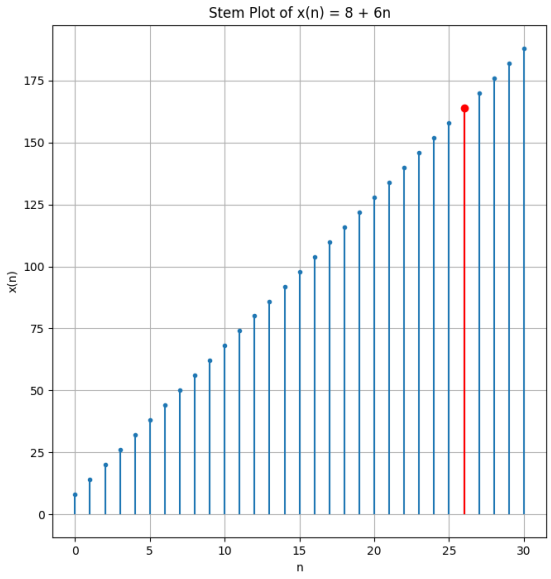

Fig. 1. Plot of x(n) vs n

$\therefore m = 26$