Assignment

11.9.5 - 22

EE23BTECH11220 - R.V.S.S Varun

Question

Find the 20th term in this series.

$$2 \times 4 + 4 \times 6 + 6 \times 8 \cdots + n\,terms$$

Solution

Symbol	Description
x(0)	first term of the series
x(n)	$(n+1)^{th}$ term of the series
x(z)	z-transform of x(n)
u(n)	unit step function

TABLE 0
Table of parameters

Given,

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

Substitute n=19 ,

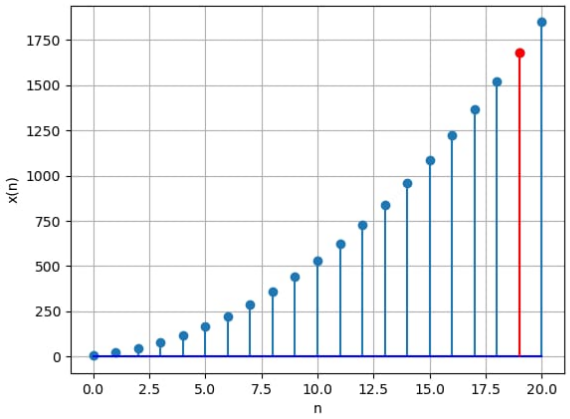
$$x(19) = 4 * 20 * 21 \tag{2}$$

$$x(19) = 1680 \tag{3}$$

So 20^{th} term of this series is 1680.
Using z- transform,

$$x(z) = \sum_{n=-\infty}^{n=\infty} 4(n+1)(n+2)\,u(n)\,z^{-n} \tag{4}$$

$$x(z) = \frac{8}{(1-z^{-1})^2} \tag{5}$$



Graph of x(n)