NCERT Discrete 11.5.9.2

EE23BTECH11201 - ABBURI TANUSHA

Question: The sum of three numbers in an arithmetic progression (AP) is 24 and the product of those three numbers is 440, find the values of the three numbers.

Solution: The following information is provided in the question:

Parameter	Value	Description
x(1)	8	Second term
d	3	common difference

TABLE I
PARAMETERS

Let the three numbers in the arithmetic progression be denoted as $a-d$, a, and $a+d$. Then,

$$(x(1)-d)+x(1)+(x(1)+d)=3a \tag{1}$$

$$3x(1)=24 \tag{2}$$

$$x(1)=8 \tag{3}$$

$$(x(1)-d)\times x(1)\times(x(1)+d)=440 \tag{4}$$

$$(8)\times(8-d)\times(8+d)=440 \tag{5}$$

$$(8-d)\times(8+d)=55 \tag{6}$$

$$d=3 \tag{7}$$

$$x(n)=(x(0)+n\times d)\,u(n) \tag{8}$$

$$x(n)=(5+3n)\,u(n) \tag{9}$$

$$X(z)=\frac{5-8z^{-1}}{(1-z^{-1})^2};|z|>1 \tag{10}$$

Therefore, The required three numbers in AP is 5,8 and 11.

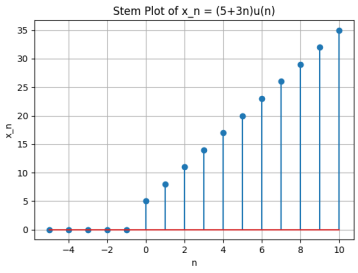

Fig. 1. stem plots of x(n)