NCERT Discrete 11.5.9.2

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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:

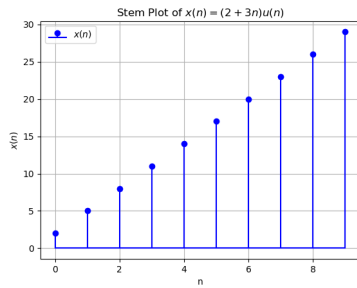| Parameter	Value	Description
a	8	First term
d	5	common difference
xi(0)	8	First term

TABLE I

PARAMETERS

Fig. 1. stem plots of $x(n)$

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

$$(a - d) + a + (a + d) = 3a \quad (1)$$

$$3a = 24 \quad (2)$$

$$a = 8 \quad (3)$$

$$(a - d) \cdot a \cdot (a + d) = 440 \quad (4)$$

$$From(4) : (8) \cdot (8 - d) \cdot (8 + d) = 440 \quad (5)$$

$$(8 - d) \cdot (8 + d) = 55 \quad (6)$$

$$d = 3 \quad (7)$$

$$x_i(n) = (x_i(0) + n \times d_i) u(n) \quad (8)$$

$$x(n) = (2 + 3n) u(n) \quad (9)$$

$$X_1(z) = \frac{5 - 2z^{-1}}{(1 - z^{-1})^2}; |Z| > 1 \quad (10)$$