

Discrete Mathematics

Samméta Saipoorna
EE23BTECH11055

1 Arithmetic Progression Problem

Which term of the arithmetic progression (AP): 3, 8, 13, 18, ..., is 78?

Parameter	Value	Description
$x(0)$	3	Initial term in the AP
d	5	Difference between consecutive terms
$x(k) \times u(k)$	78	Target term in the AP

Table 1: Input Parameters for Arithmetic Progression

To find the term number (k) when the k -th term $x(k)$ is 78 in the arithmetic progression (AP) with the given input parameters, we can use the formula:

$$x(n) = [x(0) + (n - 1)d] \times u(n) \quad (1)$$

$$(2)$$

Substituting the values from Table 1 into Equation (1):

$$78 = 3 + (k - 1) \times 5$$

$$75 = 5(k - 1)$$

$$15 = k - 1$$

$$k = 16$$

Therefore, the term number (k) when $x(k) = 78$ in the given arithmetic progression is 16.