Discrete Mathematics

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1 Arithmetic Progression Problem

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

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

Table 1: Input Parameters for Arithmetic Progression

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

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

Substituting the values from Table **??**:

$$78 = 3 + (n-1) \cdot 5 \tag{1}$$

Now, solve for n:

$$\begin{aligned} 75 &= 5(n-1) \\ 15 &= n-1 \\ n &= 16 \end{aligned}$$

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