IIITB COMET FOUNDATION

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Batch: COMETFWC22
Date : 16 April 2025

EXAMPLES

Example 4 : Which term of the AP: 21, 18, 15, . . . is -81? Also, is any term 0? Give reason for your answer.

Solution : Here, $a = 21$, $d = 18 - 21 = -3$, and $a_n = -81$. We have to find n.

As

$$a_n = a + (n-1)d,$$

$$\begin{aligned} -81 &= 21 + (n-1)(-3) \\ -81 &= 21 - 3n + 3 \\ -81 &= 24 - 3n \\ -105 &= -3n \\ n &= 35 \end{aligned}$$

Therefore, the 35^{th} term of the given AP is -81.

Now, we check if any term is 0:

$$\begin{aligned} 0 &= 21 + (n-1)(-3) \\ 0 &= 21 - 3(n-1) \\ 3(n-1) &= 21 \\ n - 1 &= 7 \\ n &= 8 \end{aligned}$$

So, the eighth term is 0.

Example 5 : Determine the AP whose 3rd term is 5 and the 7th term is 9.

Solution :

$$\begin{aligned} a_3 &= a + 2d = 5 \quad (1) \\ a_7 &= a + 6d = 9 \quad (2) \end{aligned}$$

Subtracting (1) from (2):

$$4d = 4 \Rightarrow d = 1$$

Substitute in (1):

$$a + 2(1) = 5 \Rightarrow a = 3$$

Hence, the required AP is: $3, 4, 5, 6, 7, \ldots$