AI1110 Assignment 1

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Q2 (C): In an Arithmetic Progression, the fourth and sixth terms are 8 and 16 respectively.Find :
i) common difference
ii) first term
iii) sum of the first 20 terms

Solution: Let a_i denote the i th term of the AP , d denote the common diff,
s denote the sum of first 20 terms

GIVEN : $a_4 = 8, a_6 = 14$

I. **TO FIND:**

$a_1 =?\quad d =?\quad s =?$

$$\begin{aligned}
(i) \qquad a_4 + 2d &= a_6 \\
\Rightarrow \qquad 2d &= a_6 - a_4 \\
&= 14 - 8 \\
&= 6 \\
\Rightarrow \qquad d &= \tfrac{6}{2} \\
d &= 3 \ (Ans)
\end{aligned}$$

$$\begin{aligned}
(ii) \qquad a_1 + 3d &= a_4 \\
\Rightarrow \qquad a_1 &= a_4 - 3d \\
&= 8 - 3(3) \\
&= 8 - 9 \\
a_1 &= -1 \ (Ans)
\end{aligned}$$

$$\begin{aligned}
n &= 20 \\
iii) s &= a_1 + a_2 + ... + a_{20} \\
&= \tfrac{n \times [2a_1 + (n-1)d]}{2} \\
&= \tfrac{20 \times [2(-1) + (20-1)3]}{2} \\
&= \tfrac{20 \times [-2 + (19)3]}{2} \\
&= \tfrac{20 \times [55]}{2} \\
&= 550 (Ans)
\end{aligned}$$

Hence the common difference , first term , sum of first 20 terms are 3 , -1 , 550 respectively.