Arithematic Progressions Ex 19.6 Q4

Let $A_1, A_2, A_3, A_4, A_5, A_6$ be the 6 AM's between 15 and -13

Then,

$15, A_1, A_2, A_3, A_4, A_5, A_6, -13$ are in A.P of 8 terms

Here, $-13 = a_8 = a + 7d$

$\Rightarrow \quad -13 = 15 + 7d$

or $\quad d = -4 \qquad \text{---(i)}$

$\therefore \quad A_1 = a + d = 15 - 4 = 11$

$A_2 = a + 2d = 15 - 2(4) = 7$

$A_3 = a + 3d = 15 - 4(3) = 3$

$A_4 = a + 4d = 15 - 4(4) = -1$

$A_5 = a + 5d = 15 - 4(5) = -5$

$A_6 = a + 6d = 15 - 4(6) = -9$

The 6 A.M.s between 15 and -13 are $11, 7, 3, -1, -5$ and -9.

Arithematic Progressions Ex 19.6 Q5

Let the n A.M's between 3 and 17 be $A_1, A_2, A_3, \ldots, A_n$

Then,

ATQ

$$\frac{A_n}{A_1} = \frac{3}{1} \qquad \text{---(i)}$$

We know that

$3, A_1, A_2, A_3, \ldots, A_n, 17$ are in A.P of $n+2$ terms

So, 17 is the $(n+2)$ th terms.

i.e. $\quad 17 = 3 + (n+2-1)d \qquad [\text{Using } a_n = a + (n-1)d]$

or $\quad d = \frac{14}{(n+1)} \qquad \text{---(ii)}$

$\therefore \quad A_n = 3 + (n+1-1)d$

$$= 3 + \frac{14n}{n+1} = \frac{17n+3}{n+1} \qquad \text{---(iii)}$$

$$A_1 = 3 + d = \frac{3n+17}{n+1} \qquad \text{---(iv)}$$

From (i), (iii) and iv

$$\frac{A_n}{A_1} = \frac{17n+3}{3n+17} = \frac{3}{1}$$

$\therefore \quad n = 6$

There are 6 A'M between 3 and 17.

Arithematic Progressions Ex 19.6 Q6

Let there be n A.M between 7 and 71 and let the A.M's be $A_1, A_2, A_3, \ldots, A_n$.

So,

$7, A_1, A_2, A_3, \ldots, A_n, 71$ are in A.P of $(n+2)$ terms

$A_5 = a_6 = a + 5d = 27$ [Given]

$\Rightarrow \quad a + 5d = 27$

$\Rightarrow \quad d = 4$ $[\because a = 7]$ ---(i)

The $(n+2)$ th term of A.P is 71

$\therefore \quad a_{n+2} = 7 = a + (n + 2 - 1)d$

or $\quad n = 15$

There are 15 AM's between 7 and 71.

********** END **********