CHAPTER 06

Progressions

Example:

Which of the following forms an A.P? If they form an A.P, then write the next two terms?

(I) 1, -1, -3, -5...

(II) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}...$

Sol.

(I) Given,

List of numbers is 1, -1, -3, -5... (a_1, a_2, a_3, a_4...)

Here we have, $a_2 - a_1 = -1 - 1 = -2$

$a_3 - a_2 = -3 - (-1) = -3 + 1 = -2$

$a_4 - a_3 = -5 - (-3) = -5 + 3 = -2$

Since, common difference (a_{k+1} - a_k) is same (Constant) every time.

So, the given list of numbers forms an A.P with d = –2.

The next two terms are,

$-5 + (-2) = -7$ (and)

$-7 + (-2) = -9$

(II) Given,

List of numbers is $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6} \ldots (a_1, a_2, a_3, a_4, a_5 \ldots)$

Here we have $a_2 - a_1 = \frac{2}{3} - \frac{1}{2} = \frac{4-3}{6} = \frac{1}{6}$

$$a_3 - a_2 = \frac{3}{4} - \frac{2}{3} = \frac{9-8}{12} = \frac{1}{12}$$

$$a_4 - a_3 = \frac{4}{5} - \frac{3}{4} = \frac{16-15}{20} = \frac{1}{20}$$

Since, common difference ($d = a_{k+1} - a_k$) is not same (Constant) every time.

So, the given list of numbers does not form an A.P.