ಎಸ್ಎಸ್ಎಲ್ಸಿ–ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ

MATHEMATICS Chapter–5

Arithmetic Progression

4. Write the first four terms of the A.P, when the first term a and the common difference d are given:

(i) a = 10, d = 10 **(ii) a = -2, d = 0**

(iii) a = -1, d = ½ ***(…..Contd)***

Soln :– (iii) $a = -1,\ d = \frac{1}{2}$

The general form of A.P is

a, a + d, a + 2d, a + 3d, ...

$-1, -1+\frac{1}{2}, -1+2\left(\frac{1}{2}\right), -1+3\left(\frac{1}{2}\right), \ldots\ldots$

$-1, -\frac{1}{2}, -1+\frac{1}{4}, -1+\frac{3}{2}$ .....

$\Rightarrow -1, -\frac{1}{2}, -\frac{3}{4}, \frac{1}{2}$, ...

5. Which of the following are APs? If they form an A.P, find the common difference `d' and write three more terms.

(i) 2, 4, 8, 16, . . .

(ii) 2, 5/2 , 3, 7/2 ……

(iii) – 1.2, – 3.2, – 5.2, – 7.2, . . .

(iv) – 10, – 6, – 2, 2, . . .

(v) $3, 3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}, \ldots$

(vi) 0.2, 0.22, 0.222, 0.2222, . . .

(vii) 0, – 4, – 8, –12, . ……. .

(viii) $-\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2}$.....

(ix) 1, 3, 9, 27, . . .

(x) *a, 2a, 3a, 4a,* . . .

(xi) $a, a^2, a^3, a^4, \ldots$

(xii) $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}$ . . .

(xiii) $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}$.....

(xiv) $1^2, 3^2, 5^2, 7^2, \ldots$

(xv) $1^2, 5^2, 7^2, 73, \ldots$

(This problem is from Exercise 5.1)

i) 2, 4, 8, 16, . . .

Sol:-

$a_2 - a_1 = 4 - 2 = 2$

$a_3 - a_2 = 8 - 4 = 2$

$a_4 - a_3 = 16 - 8 = 8$

Here $a_2 - a_1 \neq a_3 - a_2$

So the given list of number deos not from an AP

(ii) 2, 5/2 , 3, 7/2 ……

Soln :– (ii) $2, \frac{5}{2}, 3, \frac{7}{2}, \ldots\ldots$

$a_2 - a_1 = \frac{5}{2} - 2 = \frac{1}{2}$

$a_3 - a_2 = 3 - \frac{5}{2} = \frac{1}{2}$

$a_4 - a_3 = \frac{7}{2} - 3 = \frac{1}{2}$

i.e., $a_{n+1} - a_n$ is the same every time

hence it is an A.P with common difference $d = \frac{1}{2}$

And the next three terms are

$\frac{7}{2} + \frac{1}{2} = 4$

$4 + \frac{1}{2} = \frac{9}{2}$

$\frac{9}{2} + \frac{1}{2} = 5$

(iii) – 1.2, – 3.2, – 5.2, – 7.2, . . .

Soln : - 1.2, - 3.2, - 5.2, - 7.2, . . .

$a_2 - a_1 = -3.2 - (-1.2)$

$= -3.2 + 1.2 = 2.0$

$a_3 - a_2 = 5.2 - (-3.2)$

$= -5.2 + 3.2 = 2.0$

$a_4 - a_3 = -7.2 - (-5.2)$

$= -7.2 + 5.2 = 2.0$

i.e., $a_{n+1} - a_n$ is the same every time hence it is an A.P with common difference $d = -2.0$

And the next three terms are

$-7.2 + (-2.0) = -9.2$

$-9.2 + (-2.0) = -11.2$

$-11.2 + (-2.0) = -13.2$

(iv) – 10, – 6, – 2, 2, ……....

Soln : $-10, -6, -2, 2, \ldots\ldots$.

$a_2 - a_1 = -6 - (-10)$

$= -6 + 10 = 4$

$a_3 - a_2 = -2 - (-6)$

$= -2 + 6 = 4$

$a_4 - a_3 = 2 - (-2)$

$= 2 + 2 = 4$

i.e., $a_{n+1} - a_n$ is the same every time hence it is an A.P with common difference $d = 4$

And the next three terms are

$2 + 4 = 6$

$6 + 4 = 10$

$10 + 4 = 14$

(v) $3, 3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}, \ldots$

Soln : $3, 3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}, \ldots\ldots$

$a_2 - a_1 = (3+\sqrt{2}) - 3 = \sqrt{2}$

$a_3 - a_2 = (3+2\sqrt{2}) - (3+\sqrt{2}) = \sqrt{2}$

$a_4 - a_3 = (3+3\sqrt{2}) - (3+2\sqrt{2}) = \sqrt{2}$

i.e., $a_{n+1} - a_n$ is the same every time hence it is an A.P with common difference $d = \sqrt{2}$

And the next three terms are

$(3+3\sqrt{2}) + \sqrt{2} = 3 + 4\sqrt{2}$

$(3+4\sqrt{2}) + \sqrt{2} = 3 + 5\sqrt{2}$

$(3+5\sqrt{2}) + \sqrt{2} = 3 + 6\sqrt{2}$

(vi) 0.2, 0.22, 0.222, 0.2222, . . .

Soln : $a_2 - a_1 = (0.22) - 0.2 = 0.02$

$a_3 - a_2 = (0.222) - (0.22) = 0.002$

Here $a_2 - a_1 \neq a_3 - a_2$ So the given list of number deos not from an AP

(Contd……)