ಎಸ್ಎಸ್ಎಲ್ಸಿ–ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ

MATHEMATICS Chapter–5

Arithmetic Progression

EXERCISE 5.2

5. Find the number of terms in each of the following APs :

(i) 7, 13, 19, . . . , 205

$(ii) 18, 15\frac{1}{2}, 13 \ldots\ldots\ldots\ldots\ldots -47$

Soln:- *(…….Contd)*

$(ii)\ 18,\ 15\frac{1}{2},\ 13 \ldots\ldots\ldots\ldots\ldots -47$

$Here\ a = 18$

$d = 15\frac{1}{2} - 18 = \frac{31}{2} - 18 = -\frac{5}{2}$

$a_n = -47$

let the number of term be n

$a + (n-1)d = 47$

$18 + (n-1)\left(-\frac{5}{2}\right) = -47$

$-\left(\frac{5}{2}\right)(n-1) = -65$

$n - 1 = \frac{65x2}{5}$

$n - 1 = 26$

$n = 26 + 1 = 27$

Hence the number of term of the given AP is 27

6. Check whether – 150 is a term of the AP : 11, 8, 5, 2 ……....

Soln:- The given list of numbers is 11, 8, 5, 2……

$\Rightarrow a_2 - a_1 = 8 - 11 = -3$

$\Rightarrow a_3 - a_2 = 5 - 8 = -3$

$\Rightarrow a_4 - a_3 = 2 - 5 = -3$

i.e., $a_{n+1} - a_n$ is the same every time. So, the given list of number from an A.P with first term $a = 11$ and common difference d = -3

Let -150 be the n terme of the given AP

Then $a_n = 150$

$a_n = a + (n-1)d = 150$

$11 + (n-1)(-3) = 150$

$-3(n-1) = 150 - 11$

$-3(n-1) = 161$

$-3(n-1) = 161$

$3(n-1) = 161$

$(n-1) = \frac{161}{3}$

$n = \frac{161}{3} + 1$

$n = \frac{164}{3}$

But n should be a positive integer. So -150 is not a term of 11, 8, 5, 2……..

7) Find the 31st term of an AP whose 11th term is 38 and the 16th term is 73.

Soln:- Let the first term and the common difference of AP be a and d respectively.

Then 11^{th} term = 38

a + (11-1)d = 38 ($a_n = a + (n-1)d$)

a + 10d = 38..... (1)

and 16^{th} term= 73

a+ (16-1)d=73..... (2)

Solving (1) and (2) we get

a = - 32 d= 7

There fore 31^{st} term

= a + (31 - 1) d

= a + 30d

= - 32+(30)(7)

= -32+210 = 178

Hence, the 31st term of the AP is 178

8. An AP consists of 50 terms of which 3rd term is 12 and the last term is 106. Find the 29^{th} term.

Soln:- Let the first term and the common difference of AP be a and d respectively.

Then 3rd term = 12

a + (3-1)d = 12

($\because a_n = a + (n-1)d$)

a + 2d = 12..... (1)

Last term=106

and 50^{th} term = 106

{ $\because$ **The AP consists of 50 terms}**

a + (50-1) d = 106.

a + (49) d = 106..... (2)

Solving (1) and (2) we get

a = 8 d=2

There fore 29th term of the AP

= 8+(29-1)d ($\because a_n = a + (n-1)d$)

= 8 + 28d

= 8+(28)(2)

= 8+56

= *64*

9. If the 3rd and the 9th terms of an AP are 4 and – 8 respectively, which term of this AP is zero?

Soln:- Let the first term and the common difference of AP be a and d respectively.

Then 3rd term = 4

a + (3-1)d = 4 ($\because a_n = a + (n-1)d$)

a + 2d = 4..... (1)

9th term = - 8

a + (9-1) d = - 8

a + 8d = - 8.....(2)

Solving (1) and (2) we get

a = 8 d= - 2

Let the n^{th} term of AP be *zero*

(Contd…)