



Arithmetic Progressions Ex 19.4 Q4

The natural numbers which are divisible by 2 or 5 are:

$$2 + 4 + 5 + 6 + 8 + 10 + \dots + 100 = (2 + 4 + 6 + \dots + 100) + (5 + 15 + 25 + \dots + 95)$$

Now $(2 + 4 + 6 + \dots + 100)$ and $(5 + 15 + 25 + \dots + 95)$ are AP with common difference 2 and 10 respectively.

Therefore

$$\begin{aligned} 2 + 4 + 6 + \dots + 100 &= 2 \frac{50}{2} (1 + 50) \\ &= 2550 \end{aligned}$$

Again

$$\begin{aligned} 5 + 15 + 25 + \dots + 95 &= 5(1 + 3 + 5 + \dots + 19) \\ &= 5 \left(\frac{10}{2} \right) (1 + 19) \\ &= 500 \end{aligned}$$

Therefore the sum of the numbers divisible by 2 or 5 is:

$$\begin{aligned} 2 + 4 + 5 + 6 + 8 + 10 + \dots + 100 &= 2550 + 500 \\ &= 3050 \end{aligned}$$

Arithmetic Progressions Ex 19.4 Q5

The series of n odd natural numbers are $1, 3, 5, \dots, n$

Where n is odd natural number

Then, sum of n terms is

$$\begin{aligned} S_n &= \frac{n}{2} [2a + (n-1)d] \\ &= \frac{n}{2} [2(1) + (n-1)(2)] \\ &= n^2 \end{aligned}$$

The sum of n odd natural numbers is n^2 .

Arithmetic Progressions Ex 19.4 Q6

The series so formed is $101, 103, 105, \dots, 199$

Let number of terms be n

Then,

$$\begin{aligned} a_n &= a + (n-1)d = 199 \\ \Rightarrow 199 &= 101 + (n-1)2 \\ \Rightarrow n &= 50 \end{aligned}$$

$$\text{The sum of } n \text{ terms} = S_n = \frac{n}{2} [a + l]$$

$$\begin{aligned} S_{50} &= \frac{50}{2} [101 + 199] \\ &= 7500 \end{aligned}$$

The sum of odd numbers between 100 and 200 is 7500.

Arithmetic Progressions Ex 19.4 Q7

The odd numbers between 1 and 100 divisible by 3 are 3, 9, 15, ..., 999

Let the number of terms be n then, n th term is 999.

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

$$999 = 3 + (n - 1)6$$

$$\Rightarrow n = 167$$

The sum of n terms

$$S_n = \frac{n}{2}[a + l]$$

$$\Rightarrow S_{167} = \frac{167}{2}[3 + 999]$$

$$= 83667$$

Hence proved.

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