Arithematic Progressions Ex 19.4 Q4

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

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

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

Therefore

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

Again

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

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

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

Arithematic Progressions Ex 19.4 Q5

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

Where n is odd natural number

Then, sum of n terms is

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

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

Arithematic Progressions Ex 19.4 Q6

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

Let number of terms be n

Then,

$$a_n = a+(n-1)d = 199$$

$$\Rightarrow \quad 199 = 101+(n-1)2$$

$$\Rightarrow \quad n = 50$$

The sum of n 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.

Arithematic Progressions Ex 19.4 Q7

The odd numbers betwwen 1 and 100 divisible by 3 are $3, 9, 15, \ldots, 999$

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

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

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

$$\Rightarrow \quad n = 167$$

The sum of n terms

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

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

$$= 83667$$ Hence proved.

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