Arithematic Progressions Ex 19.4 Q23

$a_5 = a + 4d = 30$ ---(i)   [Given]

$a_{12} = a + 11d = 65$ ---(ii)   [Given]

From (i) and (ii)

$d = 5$ and $a = 10$

Then,

Sum of irst 20 terms is

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

$$\Rightarrow \quad S_{20} = \frac{20}{2}\left[2 \times 10 + (20-1)5\right]$$

$$= 1150$$

Sum of first 20 terms is 1150.

Arithematic Progressions Ex 19.4 Q24

Here,

$$a_k = 5k + 1$$

$$a_1 = 5 + 1 = 6$$

$$a_2 = 5(2) + 1 = 11$$

$$a_3 = 5(3) + 1 = 16$$

$$d = 11 - 6 = 16 - 11 = 5$$

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

$$= \frac{n}{2}\left[2(6) + (n-1)(5)\right]$$

$$= \frac{n}{2}\left[12 + 5n - 5\right]$$

$$S_n = \frac{n}{2}(5n + 7)$$

Arithematic Progressions Ex 19.4 Q25

sum of all two digit numbers which when divided by 4, yields 1 as remainder, $\Rightarrow$ all 4n+1 terms with n $\geq$ 3

$13, 17, 21, \ldots\ldots\ldots 97$

$n = 22, a = 13, d = 4$

$$sum\, of\, terms = \frac{22}{2}\left[26 + 21 \times 4\right] = 11 \times 110 = 1210$$

Arithematic Progressions Ex 19.4 Q26

Sum of terms 25, 22, 19,......, is 116

$$\frac{n}{2}\left[50+(n-1)(-3)\right]=116$$

$$\frac{n}{2}\left[53-3n\right]=116$$

$$53n-3n^2=232$$

$$3n^2-53n+232=0$$

$$3n^2-29n-24n+232=0$$

$$n(3n-29)-8(3n-29)=0$$

$$(3n-29)(n-8)=0$$

$$\Rightarrow n=8\,or\,\frac{29}{3}$$

n cannot be in fraction, so n=8

last term=25-7×3=4

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