



Arithmetic Progressions Ex 19.4 Q23

$$a_5 = a + 4d = 30$$

---(i) [Given]

$$a_{12} = a + 11d = 65$$

---(ii) [Given]

From (i) and (ii)

$$d = 5 \text{ and } a = 10$$

Then,

Sum of first 20 terms is

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

$$\Rightarrow S_{20} = \frac{20}{2} [2 \times 10 + (20-1)5] \\ = 1150$$

Sum of first 20 terms is 1150.

Arithmetic Progressions Ex 19.4 Q24

Here,

$$a_k = 5k + 1$$

$$a_1 = 5 + 1 = 6$$

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

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

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

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

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

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

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

Arithmetic 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,.....97

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

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

Arithmetic Progressions Ex 19.4 Q26

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

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

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

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

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

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

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

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

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

n cannot be in fraction, so n=8

$$\text{last term} = 25 - 7 \times 3 = 4$$

***** END *****