Arithematic Progressions Ex 19.4 Q15

Sum first n terms of the given AP is

$S_n = 3n^2 + 2n$

$S_{n-1} = 3(n-1)^2 + 2(n-1)$

$a_n = S_n - S_{n-1}$

$a_n = 3n^2 + 2n - 3(n-1)^2 - 2(n-1)$

$a_n = 6n - 1$

$a_r = 6r - 1$

r^{th} term is $6r - 1$.

Arithematic Progressions Ex 19.4 Q16

Given,

$a_1 = -14 = a + 0d$ ---(i)

$a_5 = 2 = a + 4d$ ---(ii)

Solving (i) and (ii)

$a_1 = a = -14$ and $d = 4$

Let ther be n terms then sum of there n terms = 40

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

$\Rightarrow \quad 40 = \frac{n}{2}[-28 + (n-1)4]$

$\Rightarrow \quad 4n^2 - 32n - 80 = 0$

or $\quad n = 10$ or -2

But n can't be negative

$\therefore \quad n = 10$

The given A.P has 10 terms.

Arithematic Progressions Ex 19.4 Q17

Given,

$a_7 = 10$

$S_{14} - S_7 = 17$ ---(i)

$\therefore \quad S_{14} = 17 + S_7 = 17 + 10 = 27$ ---(ii)

From (i) and (ii)

$S_7 = \frac{7}{2}\left[2a + (7-1)d\right]$ $\left[\text{Using } S_n = \frac{n}{2}\left[2a + (n-1)d\right]\right]$

$\Rightarrow \quad 10 = 7a + 21d$ ---(iii)

and

$S_{14} = \frac{14}{2}\left[2a + 13d\right]$

$\Rightarrow \quad 27 = 28a + 182d$ ---(iv)

Solving (iii) and (iv)

$a = 1$ and $d = \frac{1}{7}$

$\therefore$ The required A.P is

$1, 1 + \frac{1}{7}, 1 + \frac{2}{7}, 1 + \frac{3}{7}, \ldots, +\infty$

or $1, \frac{8}{7}, \frac{9}{7}, \frac{10}{7}, \frac{11}{7}, \ldots, \infty$

Arithematic Progressions Ex 19.4 Q18

Given,

$a_3 = 7 = a + 2d$ ---(i)

$a_7 = 3a_3 + 2$

$\therefore \quad a_7 = 3(7) + 2$ $[\because a_3 = 7]$

$= 23 = a + 6d$ ---(ii)

solving (i) and (ii)

$a = -1, \ d = 4$

Then, sum of 20 terms of this A.P

$\Rightarrow \quad S_{20} = \frac{20}{2}\left[2 + (20-1)4\right]$ $\left[\text{Using } S_n = \frac{n}{2}\left[2a + (n-1)d\right]\right]$

$= 10 \times 74$

$= 740$

First term is -1 common defference $= 4$, sum of 20 terms $= 740$.

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