

$$10(i) a_n = 3 + 4n$$

$$\begin{aligned} a_{n-1} &= 3 + 4(n-1) \\ &= 3 + 4n - 4 \\ &= -1 + 4n \end{aligned}$$

$$\begin{aligned} a_n - a_{n-1} &= 3 + 4n - 1 - 4n \\ &= 4 \end{aligned}$$

\therefore diff. is independent of n

$\therefore a_1, a_2, a_n, \dots, a_m, \dots$ form an A.P.

$$n=1$$

$$\begin{aligned} a_1 &= 3 + 4 \times 1 \\ &= 7 \end{aligned}$$

$$\begin{aligned} a_2 &= 3 + 4 \times 2 \\ &= 11 \end{aligned}$$

$$\begin{aligned} d &= a_2 - a_1 \\ &= 11 - 7 \\ &= 4 \end{aligned}$$

$$\begin{aligned} S_{15} &= \frac{15}{2} [2 \times 7 + 14 \times 4] \\ &= \frac{15}{2} \times (14 + 56) \\ &= \frac{15}{2} \times 70 \\ &= 525 \end{aligned}$$

$$10(ii) a_n = 9 - 5n$$

$$\begin{aligned} a_{n-1} &= 9 - 5(n-1) \\ &= 9 - 5n + 5 \\ &= 14 - 5n \end{aligned}$$

$$\begin{aligned} a_{n-2} &= 9 - 5(n-2) \\ &= 9 - 5n + 10 \\ &= 19 - 5n \end{aligned}$$

$$\begin{aligned} a_n - a_{n-1} &= 9 - 5n - 14 + 5n \\ &= -5 \end{aligned}$$

$$\begin{aligned} a_{n-1} - a_{n-2} &= 14 - 5n - 19 + 5n \\ &= -5 \end{aligned}$$

\therefore diff. remains constant

$\therefore a_1, a_2, a_3, \dots, a_n, \dots$ form A.P.

$$\begin{aligned} a_1 &= 9 - 5 \times 1 \\ &= 9 - 5 \\ &= 4 \\ \Rightarrow d &= -5 \end{aligned}$$

$$\begin{aligned} S_{15} &= \frac{15}{2} [2 \times 4 + 14(-5)] \\ &= \frac{15}{2} [8 - 70] \\ &= \frac{15}{2} \times -62 \\ &= -465 \end{aligned}$$