12. Find the rth term of an A.P. sum of whose first n terms is $2n + 3n^2$.

[Hint: $a_n = S_n - S_{n-1}$]

Solution:

Sum of first n terms be S_n given as $S_n = 2n + 3n^2$

We have to find the rth term that is a_r

Using the given hint n^{th} term is given as $a_n = S_n - S_{n-1}$

$\Rightarrow a_r = S_r - S_{r-1}$

Using $S_n = 2n + 3n^2$

$\Rightarrow a_r = 2r + 3r^2 - (2(r-1) + 3(r-1)^2)$

$\Rightarrow a_r = 2r + 3r^2 - (2r - 2 + 3(r^2 - 2r + 1))$

$\Rightarrow a_r = 2r + 3r^2 - (2r - 2 + 3r^2 - 6r + 3) \Rightarrow a_r = 6r - 1$

Hence the rth term is $6r - 1$

Long Answer Type