CHAPTER 06

Progressions

n^{th} term of a G.P:

Let a_1, a_2, a_3...be in G.P, whose 'first term' a_1 is 'a' and the common ratio is 'r'.

$\therefore$ Second term $a_2 = a.\ r = a.\ r^{(2-1)}$

Third term $a_3 = a_2.\ r = (ar) \times r = ar^2 = ar^{(3-1)}$

Fourth term $a_4 = a_3.\ r = (ar^2) \times r = ar^3 = ar^{(4-1)}$

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So, n^{th} term of a G.P with first term 'a' and common ratio 'r' is given by $a_n = ar^{n-1}$.

Note:

- The n^{th} term of a G.P is also called its general term.
- If there are only 'n' terms in a G.P then n^{th} will be the last term of G.P. In such cases, it is denoted by 'l' and given by the formula.

  $l = ar^{n-1}$, where 'l' is the last term.

Example:

Find the 10^{th} and n^{th} term of G.P; 5, 25, 125...

Sol.

Here a = 5 and r = $\frac{25}{5}$ = 5

Then,

$a_n = ar^{n-1}$

$\Rightarrow a_{10} = 5\,(5)^{10-1} = 5.5^9 = 5^{10}$

(and)

$a_n = ar^{n-1} = 5(5)^{n-1} = 5^{n-1+1} = 5^n$