Analog Assignment

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Question :
The sum of some terms of G.P. is 315 whose first term and the common ratio are 5 and 2, respectively. Find the last term and the number of terms.
Solution :
Given:

$$a = 5 \,(\text{first term}) \tag{1}$$
$$r = 2 \,(\text{common ratio}) \tag{2}$$
$$S_n = 315 \,(\text{sum of the GP}) \tag{3}$$

Number of terms (n):

$$315 = \frac{5(2^n - 1)}{2 - 1}$$

Solving for n:

$$315 = 5(2^n - 1)$$
$$63 = 2^n - 1$$
$$64 = 2^n$$
$$n = 6$$

Last term (T_n):

$$T_n = a \cdot r^{(n-1)}$$
$$T_n = 5 \cdot 2^{(6-1)}$$

Calculating:

$$T_n = 5 \cdot 32$$
$$T_n = 160$$

Therefore, the number of terms is $n = 6$ and the last term is $T_n = 160$.