

In special series questions, first try to generalise the general term and then use the following formulae,

$$\sum r = \frac{(n)(n+1)}{2}$$

$$\sum 1 = n$$

$$\sum r^2 = \frac{(n)(n+1)(2n+1)}{6}$$

$$\sum r^3 = \frac{(n)(n+1)}{2} = (\sum r)^2$$

$$\sum_{i=0}^{n-1} ar^i = \frac{a(r^n - 1)}{(r-1)}, \quad r \neq 1$$

where, $\sum f(r)$ is equal to $\sum_{r=1}^n f(r)$