Calcul de la somme de n termes (S_n) d'une progression géométrique

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\begin{array}{rcccccccccccccc}
r\,S_n & = & & & r\,t_1 & + & r\,t_2 & + & r\,t_3 & + & \dots & + & r\,t_{n-2} & + & r\,t_{n-1} & + & r\,t_n \\
-\ S_n & = & t_1 & + & t_2 & + & t_3 & + & t_4 & + & \dots & + & t_{n-1} & + & t_n & & \\
\hline
r\,S_n - S_n & = & -\,t_1 & + & (r\,t_1 - t_2) & + & (r\,t_2 - t_3) & + & (r\,t_3 - t_4) & + & \dots & + & (r\,t_{n-2} - t_{n-1}) & + & (r\,t_{n-1} - t_n) & + & r\,t_n \\
 & & & & \underbrace{t_2 - t_2}_{0} & & \underbrace{t_3 - t_3}_{0} & & \underbrace{t_4 - t_4}_{0} & & & & \underbrace{t_{n-1} - t_{n-1}}_{0} & & \underbrace{t_n - t_n}_{0} & &
\end{array}
$$

RESULTAT : $\underbrace{r\,S_n - S_n}_{S_n(r-1)} = r\,t_n - t_1 = t_n \cdot r - t_1$

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\rightarrow \boxed{S_n = \frac{t_n \cdot r - t_1}{r - 1}} = \frac{t_1 \cdot r^n - t_1}{r - 1} = \frac{t_1(r^n - 1)}{r - 1} = \boxed{t_1 \frac{r^n - 1}{r - 1}}
$$