Series flowchart

You are given a series, $\sum_{k=0}^{\infty} t_k$.

Is $\lim_{k \to \infty} t_k = 0$?

no → The series diverges

yes ↓

Is the ratio $\frac{t_{k+1}}{t_k}$ the same for all k?

no → The series is not a geometric progression.

yes ↓

You have a geometric progression $\sum_{k=0}^{\infty} ar^k$ with $|r| < 1$ and so it converges to $\frac{a}{1-r}$.

What is the value of $\lim_{k \to \infty} \left| \frac{t_{k+1}}{t_k} \right|$?

< 1 → The series converges

$= 1$ → The ratio test is inconclusive

> 1 → The series diverges

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