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Ex:

- $\sum_{n=1}^{\infty} \frac{(x-6)^n}{n^n}$ Root test:

$$L = \lim_{n\to\infty} \left| \frac{(x-6)^n}{n^n} \right|^{\frac{1}{n}} = \lim_{n\to\infty} \left| \frac{x-6}{n} \right| = |x-6| \lim_{n\to\infty} \frac{1}{n}$$

$= 0$ regardless of the x. Thus $L = 0 < 1 \ \forall x \in \mathbb{R}$

This means this series converges for all x. Then the interval of convergence is $(-\infty, \infty)$. Then the radius of convergence is INFINITY.