$$\begin{cases} \sum a_n x^n & \text{Konv-Rad } r \leqslant R \\ \sum b_n x^n & \text{Konv-Rad } R \end{cases} \Rightarrow \sum (a_n + b_n) \, x^n \text{ Konv-Rad } r$$

$$\overline{x} < r \Rightarrow \sum (a_n + b_n) \, x^n \text{ konv}$$

$$r < \overline{x} < R \Rightarrow \sum (a_n + b_n) \, x^n \text{ div}$$

$$0 < \overline{a_{n+}/a_n} \rightsquigarrow q \geqslant 0 \Rightarrow \sum_{n \geqslant 0} a_n \, x^n \text{ Konv-Rad } 0 < 1/q \leqslant \infty$$

Konv-Int/Endpunkte/Reihenwert

$$\sum_{n \geqslant 0} 2^{1-n} \, x^n$$

Konv-Radius/abs konv/Endpunkte/erste 5 Glieder

$$\sum_{n \geqslant 0} \frac{x^n}{n^2 + 2n + 2}: \quad \sum_{n \geqslant 0} \frac{n-1}{n^2+1} x^n: \quad \sum_{n \geqslant 0} \frac{n+1}{n^2+1} x^n: \quad \sum_{n \geqslant 0} \frac{n}{n+1} x^n: \quad \sum_{n \geqslant 1} \frac{x^n}{\sqrt{n+1}}$$

$$\sum_{n \geqslant 1} \frac{(-1)^n}{(n+1) \, 2^{n+2}} x^{n-1}: \quad \sum_{n \geqslant 1} \frac{2^n}{n} (x-1)^{3n}: \quad \sum_{n \geqslant 0} \frac{n^2}{3^n} x^{2n}: \quad \sum_{n \geqslant 0} \frac{3^n}{n+1} x^{2n}: \quad \sum_{n \geqslant 0} \frac{(x+1)^{n+2}}{2^n n^3}$$

$$\sum_{n \geqslant 0} \frac{(-3)^n}{\sqrt{n+1}} x^{n+1}$$

$$\overline{\frac{(-3)^{n+1} x^{n+2}}{\sqrt{n+2}} \frac{\sqrt{n+1}}{(-3)^n x^{n+1}}} = \overline{-3x \sqrt{\frac{n+1}{n+2}}} = 3\overline{x} \sqrt{\frac{1+1/n}{1+2/n}} \rightsquigarrow 3\overline{x} < 1 \Leftrightarrow \overline{x} < \frac{1}{3} = R$$

$$x = -1/3: \quad \sum_{n \geqslant 0} \frac{(-3)^n (-1/3)^{n+1}}{\sqrt{n+1}} = -\frac{1}{3} \sum_{n \geqslant 0} \frac{1}{\sqrt{n+1}} = -\infty \text{ da } \sqrt{n+1} \leqslant n+1$$

$$x = 1/3: \quad \sum_{n \geqslant 0} \frac{(-3)^n (1/3)^{n+1}}{\sqrt{n+1}} = \frac{1}{3} \sum_{n \geqslant 0} \frac{(-1)^n}{\sqrt{n+1}} \text{ konv/Leib } \frac{1}{\sqrt{n+1}} \rightsquigarrow 0 \text{ antiton}$$

$$\sum \frac{2n+1}{n(n+1)} x^n$$

$$\frac{(2n+3)x^{n+1}}{(n+1)(n+2)} \frac{n(n+1)}{(2n+1)x^n} = x\frac{(2n+3)n}{(2n+1)(n+2)} = x\frac{(2+3/n)}{(2+1/n)(1+2/n)} \rightsquigarrow x \Rightarrow R = 1$$

$$x = -1: \quad \sum \frac{2n+1}{n(n+1)} (-1)^n \text{ konv/Leib}: \quad x = 1: \quad \sum \frac{2n+1}{n(n+1)} \text{ div}$$

$$\sum_{n \geqslant 0} \frac{\sqrt{n} + \sin n}{n^3} x^{2n}$$

Konv-Rad/ohne Endpkt/abs Konv

$$\sum_{n \geqslant 1} \left(\sqrt{n} + \frac{1}{\sqrt{n}}\right) x^{2n+1}: \quad \sum_{n \geqslant 0} \frac{(n!)^2}{(2n)!} x^n: \quad \sum \left(1 + \log 2^n\right) x^n: \quad \sum_{n \geqslant 1} \frac{n!}{n^n} x^n$$