$$\text{product } x_n : y_n \rightsquigarrow x : y \Leftrightarrow \begin{cases} x_n \rightsquigarrow x \\ y_n \rightsquigarrow y \end{cases}$$

$$a_n \rightsquigarrow a \Leftrightarrow a_{2n} \rightsquigarrow a \leftsquigarrow a_{2n+1} \Leftrightarrow a_{2n} / a_{2n+1} / a_{3n} \text{ konv}$$

$$a_n \rightsquigarrow a \underset{\text{Def}}{\Longrightarrow} \begin{cases} a_{n+k} \rightsquigarrow a \\ a_{kn} \rightsquigarrow a \end{cases}$$

$$a \leftsquigarrow a_n \rightsquigarrow b \Longrightarrow a = b$$

$$a \neq b \text{ wahle } \varepsilon = \frac{\overline{a-b}}{2}$$

$$a_n \rightsquigarrow a \Longrightarrow \overline{a_n} \rightsquigarrow \overline{a}$$

$$\begin{cases} b \geqslant a_n \rightsquigarrow a \Longrightarrow b \geqslant a \\ a \leftsquigarrow a_n \leqslant b_n \rightsquigarrow b \Longrightarrow a \leqslant b \end{cases} \quad \text{?auch for } <$$

$$\text{ang } a > b: \quad \varepsilon = \frac{a-b}{2}$$

$$a_n \rightsquigarrow a < 0 \Longrightarrow \bigvee_m \bigwedge_{n \geqslant m} a_n < 0$$

$$\begin{cases} a_n \text{ bes} \\ b_n \rightsquigarrow 0 \end{cases} \Longrightarrow a_n \, b_n \rightsquigarrow 0$$

$$a_n \rightsquigarrow o \leftsquigarrow b_n: \quad a_n \leqslant c_n \leqslant b_n \Longrightarrow c_n \rightsquigarrow o$$

$$0 < q < 1: \quad \overline{a_{n+} - a_n} \leqslant q \overline{a_n - a_{n-}} \Longrightarrow \text{ konv}$$

$$\overline{a_{n+} - a_n} \leqslant 2^{-n} \Longrightarrow a_n \underset{\text{Cau}}{\rightsquigarrow} \quad \text{(teleskop/geom Summe)}$$

$$a_n \text{ bes} \Longrightarrow \max_{i \leqslant n} a_i \text{ konv/Lim}$$

$$\mathbb{R} \ni a_n \rightsquigarrow a \Longrightarrow \frac{a_1 + \cdot\cdot + a_n}{n} \rightsquigarrow a$$

$$\begin{aligned}
\frac{a_1 + \cdot\cdot + a_n}{n} - a &= \frac{\overbrace{a_1 - a} + \cdot\cdot + \overbrace{a_m - a}}{n} + \frac{\overbrace{a_{m+1} - a} + \cdot\cdot + \overbrace{a_n - a}}{n} \\
&\leqslant \frac{\overbrace{a_1 - a} + \cdot\cdot + \overbrace{a_m - a}}{n} + \frac{\overbrace{a_{m+1} - a} + \cdot\cdot + \overbrace{a_n - a}}{n} \\
&\leqslant \frac{\overbrace{a_1 - a} + \cdot\cdot + \overbrace{a_m - a}}{n} + \frac{(n-m)\,\varepsilon}{n} \leqslant \frac{\overbrace{a_1 - a} + \cdot\cdot + \overbrace{a_m - a}}{n} + \varepsilon
\end{aligned}$$

$$\frac{1 + 2 + \cdot\cdot + n}{n+2} - \frac{n}{2} = \frac{1}{n+2}\frac{n\,(n+1)}{2} - \frac{n}{2} = \frac{n\,(n+1) - n\,(n+2)}{2n+2} = \frac{-n}{2\,(n+2)} \rightsquigarrow -\frac{1}{2}$$