Ex 3 | $\sum u_n$

① $u_n = \frac{n+1}{n^2+1} \geq 0$

$u_n \sim \frac{1}{n}$ Riemann + equiv : $\sum u_n$ DV.

② $u_n = \frac{n!}{n^n} \geq 0$ → D'Alembert ?

$$\frac{u_{n+1}}{u_n} = \frac{(n+1)!}{(n+1)^{n+1}} \times \frac{n^n}{n!} = (n+1)\frac{1}{n+1}\left(\frac{n}{n+1}\right)^n$$

$$= \left(\frac{n}{n+1}\right)^n \to e^{-1} < 1$$

D'Alembert $\sum u_n$ CV.

③ $u_n = (-1)^n \tan\left(\frac{1}{n^2}\right)$

↳ Leibniz ?

$\frac{1}{n^2} \searrow$, $\tan \nearrow$ } dmc $\tan\left(\frac{1}{n^2}\right) \searrow$

$\frac{1}{n^2} \to 0$, $\tan$ continue en 0 } dmc $\tan\left(\frac{1}{n^2}\right) \to 0$

Leibniz $\sum (-1)^n \tan\left(\frac{1}{n^2}\right)$ CV