$$\frac{2 + (-1)^n}{n^{3/2}} \leq \frac{3}{n^{3/2}}$$

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$$\sum \tan \frac{1}{n}$$

$$\frac{\frac{1}{n}}{\tan \frac{1}{n}} \longrightarrow$$

$$\frac{-\frac{1}{n^2}}{\sec^2 \frac{1}{n} \cdot \left(-\frac{1}{n^2}\right)} = \cos^2 \frac{1}{n} \longrightarrow 1$$

(11) $\sum_{n=1}^{\infty} \frac{\cos\frac{1}{n}}{n^2} \leq \frac{1}{n^2}$ $\leftarrow$ $\frac{1}{n^p}$ test

$\therefore$ converges by comparison test

$$\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2} \longrightarrow \int_2^{\infty} \frac{1}{x(\ln x)^2}\,dx$$

$u = \ln x$

$du = \frac{1}{x}\,dx$

$\int_{\ln 2}^{\infty} \frac{1}{u^2}\,du$ converges so $\sum$ converges

$\frac{1}{x^p}$ rule

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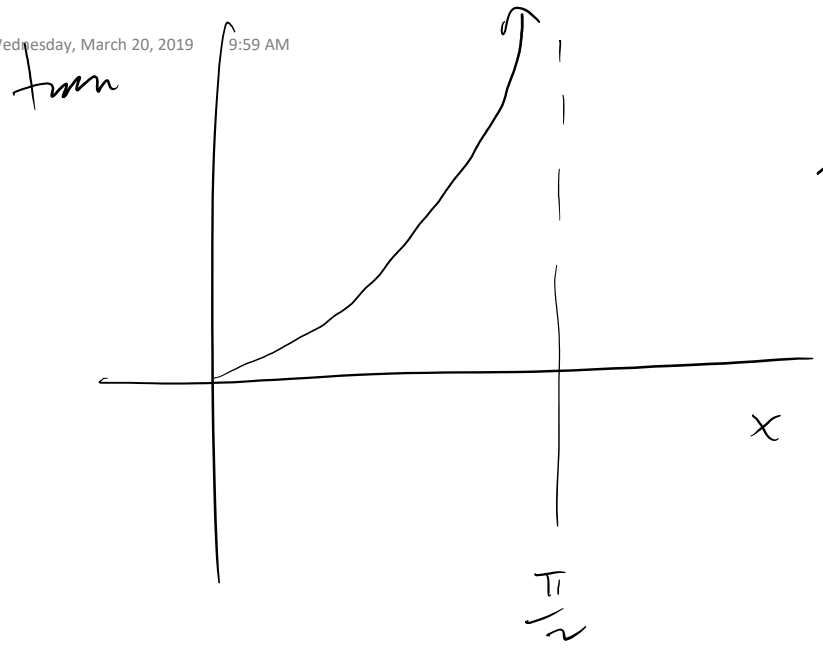

$\lim_{x \to \frac{\pi}{2}^-} \tan x = \infty$

$\lim_{x \to \infty} \tan^{-1} x = \frac{\pi}{2}$