Problema rămasă Tutoriat 2

$x_n = \frac{\sqrt{1-\cos\frac{\pi}{n}}}{n \cdot \ln(n+1)}$

$1 - \cos\frac{\pi}{n} = 1 - \cos\frac{2\pi}{2n} = 2\sin^2\frac{\pi}{2n}$

$x_n = \frac{\sqrt{2\sin^2\frac{\pi}{2n}}}{n \cdot \ln(n+1)} = \frac{\sqrt{2} \cdot \sin\frac{\pi}{2n}}{n \cdot \ln(n+1)}$

$\sin\frac{\pi}{2n} < \frac{\pi}{2n} \Rightarrow \frac{\sqrt{2} \cdot \sin\frac{\pi}{2n}}{n \cdot \ln(n+1)} < \frac{\sqrt{2} \cdot \frac{\pi}{2n}}{n \cdot \ln(n+1)} = \frac{\pi\sqrt{2}}{2n^2 \ln(n+1)}$

Pentru $n \geq e^3 - 1 \Rightarrow \ln(n+1) \geq 3 > \frac{\sqrt{2}}{2} \cdot \pi$ ✓

$\Rightarrow \frac{\pi\sqrt{2}}{2n^2 \ln(n+1)} < \frac{\ln(n+1)}{n^2 \cdot \ln(n+1)} = \frac{1}{n^2}$

$\Rightarrow x_n < \frac{1}{n^2}$

$\frac{1}{n^2}$ serie convergentă } C. COMPARAȚIEI $\Rightarrow \sum_n x_n$ converge

✓✓