$$u_n = \frac{n+2}{2n-1} + \frac{\sin(n)}{n}$$

$$\lim_{n \to +\infty} \frac{n+2}{2n-1} = \frac{1}{2}$$

D'autre part $\quad -1 \leq \sin(n) \leq 1$

Donc $\quad -\frac{1}{n} \leq \frac{\sin(n)}{n} \leq \frac{1}{n}$

Donc $\quad -\frac{1}{n} + \frac{n+2}{2n-1} \leq \frac{n+2}{2n-1} + \frac{\sin(n)}{n} \leq \frac{1}{n} + \frac{n+2}{2n-1}$

$\Leftrightarrow \quad -\frac{1}{n} + \frac{n+2}{2n-1} \leq u_n \leq \frac{1}{n} + \frac{n+2}{2n-1}$

$\Rightarrow \quad \lim_{+\infty} \left(-\frac{1}{n} + \frac{n+2}{2n-1}\right) \leq \lim_{+\infty} u_n \leq \lim_{+\infty} \left(\frac{1}{n} + \frac{n+2}{2n-1}\right)$

$\Rightarrow \quad \frac{1}{2} \leq \lim_{+\infty} u_n \leq \frac{1}{2}$

$$\boxed{\text{Donc } \lim_{n \to +\infty} u_n = \frac{1}{2}}$$ (Theorème des gendarmes)